



House of Commons  
Environment, Food and Rural  
Affairs Committee

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# Securing food supplies up to 2050: the challenges faced by the UK

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**Fourth Report of Session 2008–09**

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# Witnesses

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	<i>Page</i>
<b>Thursday 11 December 2008, HC 266</b>	
<b>Professor Tim Lang</b> , Professor of Food Policy, City University, <b>Mr Chris Brown</b> , Head of Sustainable and Ethical Sourcing, ASDA, <b>Mr Peter Kendall</b> , President of the National Farmers' Union and <b>Ms Jenny Linford</b> , food writer and member of the Guild of Food Writers, <b>Mr Jan McCourt</b> , Owner of Northfield Farm, <b>Ms Hannah Devlin</b> , Research Fortnight, <b>Ms Annette Pinner</b> , Vegetarian Society, <b>Mr Johann Tasker</b> , Farmers Weekly and <b>Ms Clare Oxborrow</b> , Friends of the Earth	Ev 1
<b>Wednesday 28 January 2009</b>	
<b>Professor Tim Lang</b> , Professor of Food Policy, City University	Ev 12
<b>Professor John Beddington</b> , Government Chief Scientific Adviser	Ev 26
<b>Wednesday 4 February 2009</b>	
<b>Mr Andrew Jarvis</b> and <b>Ms Kate Bailey</b> , Chatham House food supply project	Ev 47
<b>Professor Ian Crute</b> , Director and <b>Mr Bill Clark</b> , Rothamsted Research; <b>Professor David Pink</b> and <b>Professor Brian Thomas</b> , Warwick HRI	Ev 66
<b>Wednesday 25 February 2009</b>	
<b>Ms Lucy Neville-Rolfe</b> , Executive Director, Tesco	Ev 81
<b>Ms Melanie Leech</b> , Director General and <b>Mr Andrew Kuyk</b> , Director of Sustainability and Competitiveness, The Food and Drink Federation, <b>Mr Willem-Jan Laan</b> , Director, Global External Affairs, Unilever	Ev 101
<b>Wednesday 4 March 2009</b>	
<b>Mr Barrie Deas</b> , Chief Executive, National Federation of Fishermen's Organisations	Ev 114
<b>Mr Henry Aubrey-Fletcher</b> , President and <b>Professor Allan Buckwell</b> , Policy Director, Country Land and Business Association; <b>Mr Peter Kendall</b> , President and <b>Mr Tom Hind</b> , Head of Economics and International Affairs, National Farmers' Union	Ev 126
<b>Wednesday 18 March 2009</b>	
<b>Mr Andrew Wood</b> , Executive director, Evidence and Policy, Natural England	Ev 149
<b>Monday 30 March 2009</b>	
<b>Mr Monty Don</b> , President, <b>Mr Robin Maynard</b> , Campaigns Director and <b>Mr Peter Melchett</b> , Policy Director, The Soil Association	Ev 173
<b>Wednesday 1 April 2009</b>	
<b>Mr Anastassios Hanitotis</b> , Head of Unit, Agricultural Policy Analysis and Perspectives, Directorate-General for Agriculture and Rural Development, European Commission	Ev 194
<b>Thursday 7 May 2009</b>	
<b>Rt Hon Hilary Benn MP</b> , Secretary of State for Environment, Food and Rural Affairs, <b>Professor Bob Watson</b> , Chief Scientific Advisor, <b>Ms Susanna May</b> , Deputy Director, Food Security and Prices Project, Department for Environment, Food and Rural Affairs	Ev 216

# List of written evidence

---

Agricultural Biotechnology Council	Ev 369
Agricultural Industries Confederation	Ev 341
Association of Convenience Stores	Ev 348
Association of Public Analysts	Ev 455
Professor John Beddington, Government's Chief Scientific Advisor	Evs 20, 38, 41
Biodynamic Agricultural Association	Ev 300
Biotechnology and Biological Sciences Research Council	Ev 394
British Association for Shooting and Conservation	Ev 286
British Pig Executive and English Beef and Lamb Executive	Ev 324
British Retail Consortium	Ev 376
British Veterinary Association	Ev 311
Richard Bruce	Ev 294
Campaign to Protect Rural England	Ev 410
Chatham House	Evs 43, 55
Compassion in World Farming	Ev 279
The Co-operative Group	Ev 448
Country, Land and Business Association	Ev 118
Covent Garden Market Authority	Ev 318
Crop Protection Association	Ev 316
Dairy UK	Ev 361
Department of Environment, Food and Rural Affairs	Evs 210, 232, 250
Directorate General for Agriculture and Rural Development, European Commission	Evs 187, 205
East Malling Research	Ev 335
Environment Agency	Ev 437
Family Farmers' Association	Ev 367
FARM	Ev 374
Federation of Wholesale Distributors	Ev 303
The Fresh Produce Consortium	Ev 403
Friends of the Earth	Ev 441
Food and Drink Federation	Evs 95, 109
Food Ethics Council	Ev 321
Food Security Ltd	Ev 422
Food Standards Agency	Ev 451
Garden Organic	Ev 351
Institute for Animal Health	Ev 384
Institute of Food Research	Ev 322
Anthony Jackson	Ev 289
Lulu Jiang and Kain Tavakkoli	Ev 459
John Innes Centre	Evs 353, 356
Professor Jonathan Jones FRS	Ev 458
Kraft Food UK & Ireland	Ev 380
LandShare CIC	Ev 275

Professor Tim Lang	Ev 20
Dr Howard Lee	Ev 304
Leicestershire Food Links	Ev 371
Marine Conservation Society	Ev 291
Dr Wayne Martindale	Ev 400
Derek Mead	Ev 432
Morrisons	Ev 357
Dr Donal Murphy-Bokern	Ev 469
National Association of British Market Authorities	Ev 330
National Farmers' Union	Evs 122, 141
National Federation of Fishermen's Organisations	Ev 112
National Institute of Agricultural Botany	Ev 420
Natural England	Evs 143, 160
Northern Foods	Ev 287
Reverend John Oliver	Ev 285
Research Councils UK	Ev 387
Wyndham Rogers-Coltman, OBE	Ev 271
Rothamsted Research	Evs 57, 77
The Royal Academy of Engineering	Ev 406
The Royal Society of Chemistry	Ev 343
Royal Society for the Protection of Birds	Ev 415
RSPCA	Ev 272
Sainsbury's	Ev 428
Jill Sanders	Ev 408
Nicholas Saphir	Ev 309
John Scott	Ev 357
The Soil Association	Ev 166
Syngenta	Ev 423
Tenant Farmers Association	Ev 298
Tesco	Ev 91
Unilever	Ev 99
University of Reading	Ev 315
Waitrose	Ev 433
Warwick HRI	Ev 61
Joanna Wheatley	Ev 397
The Woodland Trust	Ev 284
World Wide Fund for Nature UK	Ev 336

# Oral evidence

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## Taken before the Environment, Food and Rural Affairs Committee on Thursday 11 December 2008

Members present:

Mr Michael Jack, in the Chair

Mr David Drew  
Mr James Gray

Lynne Jones  
David Lepper

*Witnesses:* **Mr Tim Lang**, Professor of Food Policy, City University, **Mr Chris Brown**, Head of Sustainable and Ethical Sourcing, ASDA, **Mr Peter Kendall**, President of the National Farmers' Union and **Ms Jenny Linford**, food writer and member of the Guild of Food Writers, **Mr Jan McCourt**, Owner of Northfield Farm, **Ms Hannah Devlin**, Research Fortnight, **Ms Annette Pinner**, Vegetarian Society, **Mr Johann Tasker**, Farmers Weekly and **Ms Clare Oxborrow**, Friends of the Earth

**THE CHAIRMAN:** Ladies and gentlemen, in true *Today Programme* fashion, as the clock is approaching 9.30, we will start. Can I welcome you all to the boardroom of Borough Market this morning. From where I am sitting there is a notice on the wall behind you all that reminds me that this is an ancient market which was held in early times on London Bridge and from 1551 was moved to the High Street in The Borough, so food has been a key activity on the site where we are now for a very long time. We thought this was a very appropriate place to break some new ground as far as the Select Committee was concerned in launching our inquiry in Borough Market into securing food supplies. The reason we have done this is we are always very keen as a Committee to get on the record not just the views of what I might call the normal suspects, some of whom have been kind enough to join me on the top table this morning, and I will introduce them in a moment, but most importantly in this case some people who have some interest themselves in food, either as consumers, part of the food industry or people with a passionate view one way or the other. Can I say officially that from now on all remarks that are made will be on the parliamentary record. Once our speakers have made their contributions, if you would like to say something then that facility will be afforded to you. If you would be kind enough to remember to say your name because what you say will actually go down as part of the evidence to our inquiry. You may have something very important to say, so may I thank you in advance for what I hope will be some very useful contributions to what we are doing.

Can I introduce those who are surrounding the top table. Just before I do that, can I say there may be some flash photography. I know for some people that may cause a problem, but for the top table we are all right and I think that is the direction of the camera. Can I first of all introduce our guests who are going to make some opening remarks to trigger our discussions and to do our launch. On my left is Professor Tim Lang, Professor of Food Policy at City University. I think over the years that I have known Tim—he has helped the Select Committee before in our inquiries—he is a genuinely deeply

knowledgeable and, indeed, passionate person about food and certainly having listened to him over the years I have come to respect the fact that he has a very deep understanding of some of the main underlying issues which particularly affect questions referring to the security of our food supply.

On Tim's left we have Chris Brown, who is the Head of Sustainable and Ethical Sourcing at Asda. I know Chris because he came to help us when we were putting our thinking together, of which I will say a little more in a moment, about what we as a Committee should do inquiring into this area. He and a number of others, including Tim and Peter Kendall, came and gave us the benefit of their advice. I know from both the practical point of view of working at ASDA, but also from his contribution to helping the Committee frame its inquiry, he too is deeply knowledgeable on this subject.

On my immediate right is Peter Kendall, the current President of the National Farmers' Union. I pay particular tribute to Peter for coming along at a relatively early hour because he and Tim were in the market this morning for the *Today Programme's* one minute form of advertising for our inquiry. I say that because Peter presided in elegant fashion over the centenary dinner at the Farmers' Club and you were talking about one of your predecessors, in fact the first President of the National Farmers' Union, who I think was 16 stone when he started in office but 26 stone when he ended. You will certainly be able to tell us something about diet, good practice and food waste.

Finally, on my far right is Jenny Linford, who is a freelance food writer and a member of the Guild of Food Writers. She has done 15 books, one of which has just been launched, *A London Cookbook*. She also does the mouth watering activity of taking people round London, including Borough Market, and showing them where they can actually buy good food. Jenny very much represents not just the informed person's view about food but also very much the consumer angle.

I am also joined by members of the Committee, they are the ones with the name tags. They are David Drew, Lynne Jones, James Gray and David Lepper. I am delighted that they have been able to join us here this morning.

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11 December 2008 Mr Tim Lang, Mr Chris Brown, Mr Peter Kendall, Ms Jenny Linford, Mr Jan McCourt, Ms Hannah Devlin, Ms Annette Pinner, Mr Johann Tasker and Ms Clare Oxborough

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I am just going to explain very briefly what has caused the Committee to get into this particular area and then I am going to ask our guests if they would speak for a few moments and give us the benefit of their thoughts.

Right at the end of 2005 the Government published a document that it entitled *A Vision for the CAP* and in it was a discussion ostensibly authored by the Treasury and Defra trying to say what they thought a reformed Common Agricultural Policy ought to look like and what the implications of that would be for the UK's food supply. We did some work on it and one of the parts of our report commented on the fact that words like "food security" did not actually appear in this document as, if you like, something that we should be worried about. The report took the very clear line that if there were any problems with domestic production or anything that we wanted to source, the world would provide, the marketplace would deliver.

If we press the fast forward button to earlier this year, and perhaps developing at the back end of last year, I suppose, we saw something that we had not seen for a long time, a rapid escalation in the price of basic foodstuffs on a global basis. We had, I suppose, been in a decade of falling real prices for food and people had become complacent that anything could go wrong. This Committee did recognise the fragility of the supply chain and some of the pressures arising from things like avian influenza, problems connected with animal disease, so we were not surprised that all of a sudden the world of government reconnected with food and thought it had better look at it again. You will recall that the Cabinet Office were asked initially to prepare a strategic review of everything you ever wanted to know about food, which then ultimately became a strategy document. The Government felt that it should re-engage. Then, finally Defra got in on the act. It is quite interesting to note that for a department which has in its title, and uniquely in our Government, the word "food", it is the only government department that is responsible for one whole £65-£70 billion industry; all the others are in the Business, Enterprise and Regulatory Reform Department. Defra re-engaged all of a sudden in this principal activity and produced its own strategy.

I think everybody's focus on the matter was drawn together when in June there was a World Food Summit, and I attended that on behalf of the Committee. It was a fascinating insight into the juxtaposition between the developed, the developing and the less developed worlds and the challenges that each one of those was facing in terms of either helping to secure food supplies or, even at its most basic, "How do I feed millions of people in places like Sub-Saharan Africa".

When the Committee came to consider all of these matters the one thing that we recognised at the outset was that we were not going to get into the business of writing an encyclopaedia on the subject of food and food security and food supply. That would have meant we would have taken probably about a year, produced a vastly academic work

which would have been incredibly well written but deeply uninteresting to anybody and the policy moment, the current interest in the subject, would have passed.

Our job as a Committee is to monitor the work of the Environment, Food and Rural Affairs Department, so we started from a strictly domestic standpoint where effectively we said we wanted to look at Defra's response to the question of food security. That is exactly where we are going to start our work. In looking at the supply chain we are looking at two parts. One which is connected, if you like, with the production and ultimate transformation of basic raw materials into foodstuffs, and the second part is the robustness and the security of the food supply chain from the point of view that if something went wrong, there was a massive outbreak of disease, something that Britain imported suddenly was not available, how robust is the food chain to deal with it or if, for example, there was a terrorist attack on a major point of food production could we cope. That is what I mean about robustness. In fairness, the Government and the Institute of Grocery Distribution have been doing some work on that. That is the point at which we start.

The first part of our work is going to look at the challenges that we face in ensuring that we have a secure supply of food against the background of the two key targets set at the June meeting, which were the world would have to increase its food supply by 50% by 2030 and double by 2050. The question is what part does Britain play in meeting that challenge and what effect globally in meeting that challenge will other people's changes to the way that they deal with food issues have on us. We will want to look at issues from the domestic farming point of view on things like soil quality, water availability, the science base, have we actually got the knowledge to deal with the challenges that this inquiry will throw up, the provision of trained people, trade barriers, the way in which our land and farming are managed.

We are also not forgetting that aquaculture is another key part of our food chain and it is so often the case that one focuses on farming and horticulture but we forget that aquaculture is a key part in the UK's diet and a major source of protein on a world basis, so we will be looking at that.

Once we have identified what we think is a sensible list of the challenges that we face then the second part of our work will be to look at the solutions in terms of what Defra, Government and other bodies should be doing to ensure that we have a secure food supply in this country in the future and that we can play our part in meeting those two global targets.

That is the background to the report that we are officially launching here today. In the first instance, I would like to ask Tim Lang if he would make his first contribution.

**MR LANG:** Thank you very much. Firstly, if I can say after that introduction, I welcome this inquiry enormously. I thought about bringing along the great 1905 Royal Commission on Food Supply in Time of War because there is an astonishing resonance in everything you have just said to the

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**11 December 2008 Mr Tim Lang, Mr Chris Brown, Mr Peter Kendall, Ms Jenny Linford, Mr Jan McCourt, Ms Hannah Devlin, Ms Annette Pinner, Mr Johann Tasker and Ms Clare Oxborrow**

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debates that went on in 1903-05, but on second thoughts I thought you would not be pleased with me, so I did not, but it is huge. These are old questions but in a new form, a new guise and a new context.

We face everything you have just said, Michael. We face the new fundamentals, some of which are old, the soil and the water issues, and some of which are new, climate change, globalisation, the change in world food supply systems, etcetera. It is the jostling of that combination of factors that your Committee's inquiry will undoubtedly explore. There is a great tradition of this, so it is fabulous that this inquiry is happening.

I wanted to just pose five questions that I think we collectively, the people, and you as parliamentarians need to be, and I am sure will be, posing.

The first question is the one that you have referred to, and I agree with you, it is about production. The issue is not how much food does Britain produce but how much food could it produce and should it produce. That combination of "does", "could", "should" indicates the delicacy of the political debate. At the moment, as we all know, home production is dropping, arguably one could even say like a stone. It is dropping very fast indeed. There are those who argue this does not matter and I think that is stupid, frankly. It does matter, depending on your personal predilection, not necessarily because home grown food is intrinsically better, although for some it may be, it is actually an issue of appropriate land use in the new world that you were referring to, the world of nine billion people by 2050, a world already being reshaped by climate change, a world in which energy, which is what has actually driven production rises over the last 60 years, cheap oil, has enabled agricultural productivity to rise in the last two-thirds of a century. That era is probably coming to an end, in which case what does production do, how are we going to produce food, not just for the existing 6.7 billion people but nine billion. Down to us as people in Britain, we need to say "What is our role in that? Does it matter if Britain is only now producing 60% of indigenous production?" Personally, I think it does. I think it is inappropriate land use not to produce food when you have got the climate, soil and capability of so doing.

There are some subtle questions within production, this first issue for your inquiry, like which products. It is not the total figures. The Defra report of 2008 that you referred to, again rightly in my view, did not discriminate between meat and dairy, for example, and fruit or vegetables. I will pick on fruit. About 10% of what we consume in Britain in fruit comes from Britain. Chris Brown, as we all do, knows that we are not going to grow pineapple in Britain, not for a very long time and not unless you use extraordinary glasshouse technology, but we can grow apples and pears. Why are we allowing that production to be as low as it is? What would or could it take to increase that fruit production? What is the state of vegetable production? Our debate about food security needs to be more discriminating, not

just about the distinction between internationally and home grown food, but about what/which foods to grow "at home". That is the first question.

The second question is an issue of what I call values. What is a good food system? I keep on asking this. I am allowed to indulge myself as an academic! But I think this is mainstream politics now. What is our view of what we want a food system to be like? It is actually a values question. Why does the US or France, equally rich societies as ours, not even dream of mass importing its own food? Yet the visceral value of British food policy is the rest of the world will feed us. It is actually a hangover of Empire, dare I say it, a child brought up in India? We assume someone else is going to feed us. We assume market mechanisms will deliver. In a world when the rest of the world, thank goodness, is getting richer and we are getting poorer, not least due to the pound collapsing, those assumptions cannot necessarily hold. What is a good food system? We have got to juggle sustainability, quality, health, social criteria and aspirations into the business model. That is a values issue.

Thirdly—I am speeding up!—the cultural question. People like me have been saying for a long time that the food system has got to become more sustainable. But to get there, the food system is going to need to bring people with it. People have got used to the cornucopia of the hypermarket; they have got used to untrammelled choice; they have got used to cheap food. Food is always more expensive for the poor than the rich, but how is the behaviour of each going to change rapidly before the demands of sustainability, which it is going to have to?

I will pose a question which, as you know, I have posed to your Committee before. It is what I call the eco-nutrition problem. Both your Committee and the Health Committee have looked at the challenge of diet related diseases, at the time of the Food Standard Agency's creation. But how do we translate the need for healthier diets into food cultural rules? Not fancy nutrition-speak but everyday rules? For instance, do I eat fish or don't I? Do I eat fruit and vegetables? Where from?" "How much do I eat?" is now becoming "How do I get it?" My point is that a juggling of the ecological with the nutritional advice has got to be built into culture. That is going to be an issue of governance, which is my fourth point.

The role of Government is critical in this. Your job as the Committee is to hold Government to account. I am a great fan, as you know, of select committees, they keep ministers on their toes, they keep the system of government on its toes, it is fundamental to democracy and accountability. The issue of governance is have we got the right mechanisms, have we got the right institutions, have we got the right remit to deliver food security?

Fifthly, there is the big question of policy: what is the direction of travel? Is it right? Your inquiry, I presume, is looking at Britain but, as your remarks hinted you only too well know, we exist within Europe and the overarching policy framework is the Common Agricultural Policy. I am one of those



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11 December 2008 Mr Tim Lang, Mr Chris Brown, Mr Peter Kendall, Ms Jenny Linford, Mr Jan McCourt, Ms Hannah Devlin, Ms Annette Pinner, Mr Johann Tasker and Ms Clare Oxborrow

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people who have been arguing that the Common Agricultural Policy must ultimately become a Common Sustainable Food Policy, but is that likely? Is there room for manoeuvre in that rubric? What is the purchase on it? Could Britain take a lead? I think the Cabinet Office Strategy Unit's *Food Matters* report was actually a very good lead in that direction. It did map out a different direction of travel. Your inquiry can really lift the political discussion about that perspective. "What do we want from our food?" means "what direction do we want the food system to go in?" The question takes us right back to the 1905 Royal Commission, dare I say it! They asked exactly that: "after 60 years from the repeal of the Corn Laws, what do we want our land to do?" Personally, I think we today have a moral responsibility to maximise our production appropriately for our land, too. But that enters the little difficulty of what is appropriate sustainable production.

**THE CHAIRMAN:** It is very nice to know that my Christmas reading list has now got one book on it at least, which is the 1905 volume.

**MR LANG:** It is two volumes.

**THE CHAIRMAN:** Well, I might manage Volume 1.

**MR LANG:** No, Volume 2 is the interesting one. Those were the hearings.

**THE CHAIRMAN:** Thank you very much indeed for giving us such a thought provoking start. I would now like to ask Peter Kendall if he would be kind enough to comment and then Chris Brown and Jenny Linford, in that order.

**MR KENDALL:** Thank you very much indeed, Michael. The farming community is really pleased that your Committee has picked up on this theme. We are very conscious that in society the economy is a major focus at this moment in time and how we consider food policy in the longer term might take a bit of a back step in some of the media coverage. For us, as farmers, this is a long-term business so we are really pleased that you are focusing on it despite the economic woes that surround us at this moment in time.

Both you and Tim picked up on some of the Government reports. We continue to be amazed that some of the discussions in Defra, our sponsoring department, still focus on the *Sustainable Food and Farming Report* of 2001, and you referred to the Treasury report of 2005. I think the *Sustainable Food and Farming Report* mentioned food security and dismissed it in a single sentence. The Treasury and Defra report in 2005 said our solution can be found in having an overall global trading system. What was even more surprising, if one drills down into both of those reports, I cannot remember the exact numbers but mentions of the environment in both of them number well and truly over 100, maybe 120 mentions, productivity and competitiveness both get six or seven mentions. They are the sort of dilemmas we are facing looking at the reports that have gone on. We are really pleased that there is now the Cabinet Office report you referred to, Michael, and

other reports and your own inquiry now starting to look forward and become a developing, forward-looking agenda.

Hilary Benn spoke last night at the Fabian Society and he mentioned the importance of domestic food supply. However, we have a concern that many of the utterances from Government and Defra still talk about our dependence on what the world can do for our food security, not what we can do to contribute to world food security. You mentioned the spikes of last year and the shocks that occurred globally in the key commodity markets. I think it is important to reflect how countries reacted to that. We saw Kazakhstan, Ukraine and Russia banning exports very quickly. We saw Argentina banning exports of meat. We saw big subsidies being put on fertilizers around the world. China put a 135% tariff on the export of fertilizers to try and keep them within its own country. India currently spends approximately 2.5% of GDP giving cheap fertilizers to its farmers and a similar amount is spent on defence. At the time we thought globally we would find solutions those many countries became more inward looking and protectionist.

You said in your introduction that you are there to hold Defra to account and challenge them. We look to Defra to be a sponsoring department to the food industry in equal measure to being the one that challenges us on our environmental performance as well. Too often, we look at that balance being out of kilter. I look at how BERR champions both production of business and also holds it to account on issues like being a low carbon economy and how it can improve on its performance.

If I can pick up one of the reasons why that is out of kilter. If you look at the Public Service Agreements that are meted out to different Government departments, Defra at the moment has only one and that is about securing a healthy natural environment for everyone's wellbeing, health and prosperity now and in the future. There is no mention in any way of food production in Defra's PSA targets at this moment in time.

It is against that background that when Hilary Benn came to the Royal Show in 2007, his first official duty as Secretary of State, we challenged him on an early warning system, on how we can try and detect if, as Tim said, we are dramatically reducing our production capacity in certain sectors. I am not saying that we want Government to wave a chequebook and buy a solution to this, but to drill down and see what the cause of that decline might be. If in horticulture it is the lack of availability of labour or the wrong priority of use of water in certain areas, the lack of functioning of the marketplace, and I could mention retailer relationships, that is causing that decline then Government and Defra should drill into finding a solution to what is happening. I do think it is important we try and make sure that occurs.

Yesterday, also, Hilary Benn announced the Council of Food Policy Advisors. Following discussions with Tim this morning, there is some scientific reference on there but we would have liked to have

11 December 2008 Mr Tim Lang, Mr Chris Brown, Mr Peter Kendall, Ms Jenny Linford, Mr Jan McCourt, Ms Hannah Devlin, Ms Annette Pinner, Mr Johann Tasker and Ms Clare Oxborrow

seen a stronger production-based focused science within that group. We would have liked to have seen more commercial agricultural representation on that group if we are looking at systems going forward, and I will continue that in debate with Defra.

When I look at the challenges that Michael alluded to at the start, when I see what has happened to our scientific base, and this is a major part of your work so I am really pleased you are going to focus on it, what the constraints are and what can be done. If we look at the productivity gains in the arable sector, in the 1980s we were growing 4% a year, in the 1990s 2% a year—John Beddington gave me the figures recently—and today we are running below 1% a year increase in productivity. In 1970 we had 17 agricultural research stations in the UK; today there are three. We have now cut our research and development spending direct on agriculture by 45% in the last 30 years, it is about 20 million. You do not even get a half decent premiership footballer for 20 million! What does that tell us about our priorities today in agricultural research and development.

I am really pleased that you are going to do this report and I can tell you that the farming industry is pleased that you are doing it and we will be very keen to help you in whatever way we can.

**THE CHAIRMAN:** Good. Thank you very much indeed for those encouraging words. Now I will turn to Chris Brown.

**MR BROWN:** I will lob in my favourite report as well as we are listing them. Mine is slightly more contemporary than Tim's, it is the *Food Industry Sustainability Strategy* which was where as an industry we came together to look at and agree ways forward and it is disappointing that we have not seen too much activity from that delivery.

I looked in the *Little Oxford Dictionary* for a definition of robust and it said, "vigorous, straightforward". The straightforward bit I struggle with because sometimes I say this is a really simple industry and sometimes it is an incredibly complex one. Looking at the terms of reference and the direct questions that you were kind enough to give me, if I look at the agricultural scene as we see it, I think we see a resilient industry, an industry that has coped with rather more challenges than we would have expected to have had in recent history, one that is competent, one that is technically advanced, and I will come back to that point, and one that has delivered safety, plentiful, affordable food. It is right to point out it is 54 years since the end of rationing. In terms of things that probably need to be addressed, you have to look at the way that the farming base is structured. I am not sure that necessarily new thinking is coming about as quickly as it should, perhaps it is conservative with a small "c". It is probably apt that we are here at Borough Market. I certainly find the best debates that I have about food and about consumers come from people who operate farmers' markets and not directly with the public. There is no difference between selling eight lambs a week and 8,000 lambs a week. They are very sensible conversations that I have with these people.

I think we need to start this national debate. Is the Committee going to be looking at producing more food from our own resources because that is where we start to get into some interesting issues. We have fantastic benefits within the UK. We have the benefit of climate and soils. Peter has talked about the cereal yield and we have the world's highest cereal yields in this country and we can deliver on that. If we are going to continue to meet the challenges that the Committee has provided around how do we increase food production, are we going to stop concreting over it for a start? Is planning going to take due notice of the agricultural land that it is using up? It is apt to point out that London's western market garden now goes by the name of Heathrow and there is no sign of that coming back into agricultural production soon!

The emphasis of this discussion will have to return to one of increasing productivity. Certainly when I entered the industry that was one of the things we were talking about. We were talking about increasing levels of fertilizer application and about putting 350 kilos of nitrogen on grassland, not restricting it to 170. There is the dilemma which Tim highlighted of competing needs for land, that for food production, that for land use and that for biodiversity, which we have not addressed as an industry or as a nation.

When it comes to the issues of soil and water, the marine environment, I go back to the science bit. For those to be addressed we have to have the tools to do so. Peter is right: there was at one stage an Agricultural Research Council which supported Institutes of Soil Science, Food Science, Meat Science and others. That was combined with an extension service that was tasked with linking research results into systems that could be adopted by a wider range of farmers. We now have a very limited, fragmented research base. It is scary to look at the number of agricultural facilities that have closed and university departments that have closed. Obviously, the extension service no longer exists as it once was.

It is interesting if you look at the Defra food security consultation that it proffers global agricultural R&D spend as an indicator but, curiously, it does not require a parallel domestic measure: a case of do as I say, not as I do perhaps. I think we are starting to rely too much on overseas R&D and we need to make sure our own science base is tailored to the requirements for our own circumstances.

You asked me to talk about local food. Asda has 14 local food hubs which have got 600 new suppliers supplying in to us and that is 7,500 lines which are going in. They provide a level of quality, flavour and taste which national brands cannot match. Our local sausage range will double its sales this year over last year and will achieve about £7 million of profit. There is an opportunity there, and one which, I think, to be fair, most of the major multiples are now addressing. The economic climate is going to see more switching of purchasing. Value is a combination of quality and price and that is going to be much more prominent in customers' minds.

11 December 2008 Mr Tim Lang, Mr Chris Brown, Mr Peter Kendall, Ms Jenny Linford, Mr Jan McCourt, Ms Hannah Devlin, Ms Annette Pinner, Mr Johann Tasker and Ms Clare Oxborrow

Defra has to assist in defining the business framework. There are almost too many conflicting interests to be reconciled. The Secretary of State has said that, "We will need to cut the greenhouse gas emissions associated with food production". Taking ruminants, we can reduce methane production by reducing the level of forage in their diets, but 70% of England's agricultural area is grassland, that is what ruminants are there to consume. There is little point in denuding the uplands to feed cattle and sheep on grains imported from overseas. Where is the balance? Where is the debate? How will the competing aims of development, biodiversity, productivity and climate change be reconciled? From a business perspective, where we see a lot of pronouncements, we are increasingly looking for clear direction for us to be able to frame our longer term business strategies. There is a huge question to be addressed and I commend the Committee for doing so.

**THE CHAIRMAN:** Thank you very much indeed. Right, Jenny, would you like to give us the consumer perspective?

**MS LINFORD:** Right. Good morning. As a food writer, I have been writing about food since 1990 and in those days food was a quiet little backwater that was not particularly fashionable and then it became very fashionable and became a lifestyle accessory. In 1990 you did not have to be a celebrity to have a cookbook published but now it really helps.

It seems to me that it is only recently we have seen issues bubbling up to the surface, exactly as Tim said, this whole realisation that food is very important and is very complex. I cannot say if I write a recipe, "Go and buy some cod", because is there going to be any cod? In fact, when you look at the nature of what we are doing to fish around the world, can you give a fish recipe with a clear conscience? What happens when I go shopping, do I buy something organic or do I try and shop locally to support local growers who are non-organic? There are all of these that comes up. It is a sign of our times that our celebrity chefs, people like Jamie Oliver and Hugh Fearnley-Whittingstall, are addressing the issues, they are looking at what our schoolchildren are eating and how our pigs and chickens are being kept. The political dimension of food is very much coming to the fore.

Personally, with regard to the inquiry, there are two areas that I would like to suggest should be looked at. The first one is markets. I wrote a book about British cheeses earlier this year and talked to over 100 cheese makers. At the moment in Britain we have a very buoyant cheese scene and we actually rival France in the number of cheeses we make and people do not realise that. When I talked to the cheese makers what came up over and over again was the importance of farmers' market. One lady up in Scotland, who has been making cheese for over 40 years, said that the best thing that ever happened to her as a cheese maker was the local farmers' market, so she can take the stuff there, she can make money, she gets cash value, she cuts out the middle man and

new cheese makers can try, they can take things along to get people to try them and get feedback. That is very important.

What is sad is that when you look at markets in the UK they are under threat. Speaking as a Londoner, from Newham in East London to High Barnet in the north, traditional street markets are really fighting to survive. These are not glamorous, chichi markets where you trot along and pay a lot of money for some bread; these are basic, down-to-earth markets where people who are shopping on a budget but care enough about getting fresh food, good fresh food to cook for their families, want to go shopping there. The land that these markets are on is under threat often by developers because, until the recent property crash, it made more sense to put a block of flats up than to keep the market going. What is really sad is that when you look at local communities people want to keep the markets, they use them, but if markets lose control of the land, at some point somebody buys that land who does not have a long-term stake, the market has no protection. Personally, I feel it would be great to see some sort of local protection or duty on local government to protect markets and keep them there.

Markets are obviously a way for growers to reach the public and make money. The whole point about markets is they are cheap instead of paying expensive shop rents in London. We have seen that in Borough Market. When Borough Market started its retail food side, one of the best things about it was that it provided a way for growers in Britain coming down from Cumbria, say, Peter Gough or Tim Wilson from Wiltshire, Ginger Pig, they come down and tap into London's consumer market because they can afford to do that. It seems a very logical area that we should look at and support. There is the idea of local food co-operatives, which is another thing that is growing, where people are buying food and it is reasonable for the consumer and also supporting local food producers.

The second area that I think is very important is the idea of food knowledge which Tim was talking about. When I started writing about food and cookery I did not realise that cookery was going to become a vanishing skill. In my son's primary school playground I meet other others and when they find out I am a food writer lots of them say to me, "Do you cook from scratch every night?" and I say, "Yeah", and they are absolutely amazed. They just do not know how to do it. They do not want to do it. It is just from a different planet. Within that de-skilling of food, they are buying ready-meals, buying vegetables already chopped up, they do not whether it is a fresh vegetable if they look at a market stall. We are seeing huge amounts of food waste, which seems to be quite a fundamental area. Staggeringly, we seem to throw away about a third of the food we buy and half of that is edible food. It is wasted because people are buying too much food, they are not using it carefully. We have been used to food being cheap, used to it being ample, being available all the time. Now as we hit a recession, food prices have gone up and anybody who shops for food has

**11 December 2008 Mr Tim Lang, Mr Chris Brown, Mr Peter Kendall, Ms Jenny Linford, Mr Jan McCourt, Ms Hannah Devlin, Ms Annette Pinner, Mr Johann Tasker and Ms Clare Oxborrow**

seen the cost of their bill go up and up and up. This is time to embrace those values for cooking, making us be organised, preparing and being frugal, not expecting to have everything all the time in your laps.

**THE CHAIRMAN:** Thank you very much indeed, some stimulating comments. As somebody who has an allotment I very much warm to some of the things you were saying.

Right, ladies and gentlemen, you have been very patient in listening to what our panel has had to say. Would anybody like to make a comment or ask a question because this is your moment to contribute to our inquiry? Obviously we recognise that you have shown considerable interest in coming to join us this morning. There is always that horrible moment when somebody thinks, "Am I going to be the first person?" I am looking around and if anybody would like to raise their hand, you could be the first person! Would you be kind enough to give us your name?

**MR McCOURT:** My name is Jan McCourt. I am the owner of Northfield Farm which has traded at Borough market for very nearly ten years. I was the recipient some years ago of the NFU President's Award for Great British Food in 2001 which was very much based on the early work that I did here at Borough and elsewhere in supporting other farmers. I am interested who else is in the audience. Do we have any actual food producers here? Do we have any other stall holders from Borough?

**THE CHAIRMAN:** No, it looks like you are on your own!

**MR McCOURT:** That says quite a lot about what is going on in general and very specifically here and now. To an extent I think it undermines what you are trying to do, which is a great shame, because as set out and taking down the various points each of your principal speakers have made what you are doing is very worthwhile. However, looking from my perspective as a very small producer but someone who works with a lot of other producers as well, be it a maker of a biscuit or a baker of a bread or raiser of a sheep, a pig or a beef animal, there is a real perception of us, particularly the small producer, despite what Mr Brown said about the laudable Asda food hubs, of really being in a hinterland, of being totally ignored and forgotten.

Part of that hopefully, marvellous though this Select Committee's work is going to be and has been in other areas, is from that position. There is a distinct lack of any joined-up thinking in terms of the approach to these problems. Rather like a schoolboy I spent some time last night reading your report on the potential of the rural economy. It was fascinating to read and what came out of that, in effect, at least in my reading, was a criticism of the way that Defra is set up and its priorities, and you alluded gently at the beginning of your talk to that.

I think Jenny's mention of education, in effect, and the earlier mention from Tim of the culture of food are absolutely key to it. One of the things that needs to be established right away at the very beginning is

how do you actually define food and what is your definition of food, because, of course, you could solve, and I am criticising Mr Brown—

**MR BROWN:** Most people do!

**MR McCOURT:** I am sure you can take it. In my very modest way I am known to be something of a supermarket basher. If you read the press that has come out very recently in terms of the value lines of some of your competitors in particular, not yourself as far as I am aware, one can solve the problem overnight in terms of the lack of supply of food by emulating the very, very tiny amounts of what I would call real food that goes into a lot of these value line products. A sausage roll at 9% meat is not a sausage roll in my opinion. Then when you drill down into the economics of some of these products, the only person they represent value to is the supermarket that is selling them and they are not value at all to the consumer.

I know that my little business has a perception of being very much at the top end of the scale, whatever that means, but in some ways that is fortunate and in other ways a rather restrictive perception because one of the things I am evangelical about is the concept of value in food versus price. There are many brilliant things that Borough has done, among which without Borough I would not have a roof over my head or my business, but one of them is it is twinned with La Boqueria in Barcelona and they sponsored a group of six or eight of us to go there back in March this year to trade. I went down with my 14 year-old son, who did all the real work, and one or two of the others, without being unkind to anyone else, real producers, people who do make things and in some cases actually farm, and it was the most extraordinary experience. I would go so far as to say that this Committee cannot do its job without going down to La Boqueria!

**MR GRAY:** Hear, hear!

**MR McCOURT:** I know that raises all sorts of other issues! The culture of food down there is absolutely extraordinary and the understanding of value is extraordinary. I take small issue with Jenny who said something to the effect earlier that markets are all about cheap food or cheap prices.

**MS LINFORD:** No, great food.

**MR McCOURT:** I said "small issue". What we noticed very clearly was every single consumer that we had contact with, and obviously there were expats but the majority of them were local people, looked not at the price that was attached to the particular food, they looked at what it represented in terms of value and part of that value was the experience of talking to us, the experience of tasting it. If for their pocket the cost was too high, they simply bought less. They simply bought a sliver of stilton from us as opposed to half a stilton, or whatever it might be. I spent six days doing quite a lot of research, walking around, speaking to a lot of producers and the cultural issue which Tim referred to is absolutely key to that. Obviously there is a place for supermarkets and there is a place for the very tiny producers, such as myself, but at the moment there

11 December 2008 Mr Tim Lang, Mr Chris Brown, Mr Peter Kendall, Ms Jenny Linford, Mr Jan McCourt, Ms Hannah Devlin, Ms Annette Pinner, Mr Johann Tasker and Ms Clare Oxborrow

is a huge imbalance between the two. It has been focused on in great depth in some of the farming press recently. That cultural issue, that educational issue and that concept of value are absolutely key to whether or not we see a food production industry which is dominated by huge players where food is an absolute commodity in the same way that oil or petrol or diesel or gas is.

In some ways my very modest crusade has been to de-commoditise the commodity, to bring people back to understand that food really has a value way beyond just its nutritional value. I think that element of it and the whole joined-up involvement of different governmental departments is important, particularly at the moment because we are at an extraordinary opportunity from a food producer's point of view in terms of this wake-up call. The wake-up call is not so much the scares that you referred to earlier, although they are important and part of it, but the whole economic debate and the struggle to revive businesses, small businesses in particular, whether in rural areas or not.

Although I hate to say it, because I am not a great fan of this Government, some really good work is being done in terms of injecting realistic practical advice into small businesses. The models are there. There is a huge amount of wisdom in this field in the fields, for want of a rather trite description. There is a lot that can be learnt from the producers themselves. What they need in return is more help in actually taking their businesses forward. It is a very, very tough game. In one sense, I agree it is the same to rear eight pigs as 8,000 or whatever, but where one falls down, and I know I am guilty of it, is in the individual business structures. I think we are at a critical stage and it is possible that we lose the little players, such as myself and others, and culturally as well as in terms of quality and holding the big players to account that would be a great shame.

**THE CHAIRMAN:** Thank you very much. May I congratulate you on the passion that came through in what you are saying. One of the great values of doing something like this is that we do hear from those who are directly involved. Sometimes on select committees bodies that represent large groups of people come and talk and there is a dilution effect of the passion that you quite clearly feel. Is there anybody else in the audience who would like to talk?

**MS DEVLIN:** I am Hannah Devlin from *Research Fortnight* magazine. I have a question for Chris Brown and Peter Kendall. I am interested in the Science and R&D Standing Commission. What do you think would be the most immediate priority to increase spending on in terms of research? I also wanted to ask if there is something particular about the agricultural industry that makes it not well set-up to spend on R&D itself and why it should rely more on public spending?

**MR LANG:** It is their inquiry, not mine, but I will happily answer it to feed these thoughts to the Select Committee. On my priorities for research spend, although I agreed entirely with what both Peter and Chris said, and I thought they would say that so I did

not say it, I can work myself up into a deep lather. Can lathers be deep? I think so. You know what I mean.

**THE CHAIRMAN:** It depends which brand of soap you use.

**MR LANG:** Of course, Neal's Yard bought at Borough Market, where else! I get into a lather about the collapse of agricultural R&D. Just when we need it, we have not got it. This is going right across politics. It goes back to Rothschild, who I do not think most people here would know, David Lepper probably vaguely knows. A few people nodding, that is good, it shows our age! Rothschild was the science adviser to a previous government in the 1960s and essentially created a view that we did not need blue skies research, it should all be left to near-market and near-market should be commercially linked. Essentially, in a rush over the last 20 years we have seen the tail end of Rothschild's thinking just when in food and farming we need to have very long-term, not necessarily commercial, thinking.

Having given you my overview, my first point is we need research on eco-nutrition. We do not know what a good diet is. We do not know how to link a good diet for public health to a good diet for ecology. What is a food system which protects biodiversity? There are many schools of thought. I will give it starkly that I have heard given at Rothamsted. Blitzkrieg your growing land and put the biodiversity into fringes. The other is getting the biodiversity into the field and eat it. They are two very different approaches. They need to be looked at and that requires science.

The second is specifically an issue about multi-functionality. The pressure on land is immense already but is going to get even more immense. We have got to combine food production with fibre production, with fuel production, with retention of amenity, carbon sequestration and water sequestration. How do we manage that in a country like Britain which has, I think, geologists, teachers, almost every geological sub strait bar a few known on the planet. We have an incredibly varied soil, so we have got to have very precise issues. I nearly said it before, Michael, and I am now going to say it because I blame research for that. Defra has spent seven years trying to work out the indicators by which we judge soil health for the soil inquiry and somewhere at least in your inquiry that must be a footnote.

**THE CHAIRMAN:** It is a key issue.

**MR LANG:** It is absolutely key. We need to know what do we want from our soils. That is a huge agenda. We need a new rebuild, higher education and extension service that you referred to, Michael, for sustainable food systems, not just for farming but for the food supply chain. The need for co-ordination across that chain has immense implications for research and higher education. I would say that. The new food co-ordination requires input even from people like my team based across the Thames in the middle of the biggest city in

**11 December 2008 Mr Tim Lang, Mr Chris Brown, Mr Peter Kendall, Ms Jenny Linford, Mr Jan McCourt, Ms Hannah Devlin, Ms Annette Pinner, Mr Johann Tasker and Ms Clare Oxborrow**

Britain—I can almost see my university just across the river. I am based just over there. Urban perspectives on food are just as important for food research as that from rural Bangor University or Aberystwyth or whatever. The new agenda requires a rebirth, not of the Agricultural Research Council, but of a Sustainable Food Research Council. The beginning of that thinking is coming through projects that you will know and probably a few of us here know about, but a lot more cross-sector thinking is needed. Ultimately research and education strategy is about money, but we need to ask: money for what. The goal has got to be about sustainable food. Frankly, we do not know the answers and Government is divided on it. FSA keep saying, “Eat fish”, and the Royal Commission on Environmental Pollution have said, “Don’t”. What do I do? What is the research base? The evidence is equally good for both. How do we put that together? That is actually a science policy issue. We have got very good science policy research here in Britain but it has not been let loose enough on food and agriculture. I would like to see that, not just new resources but better use of existing science resources.

**THE CHAIRMAN:** The Committee has been concerned about this, notwithstanding the subject of today’s discussions, and Lynne Jones has been following up and doing quite a lot of work in looking at the background to our current science situation within the Defra family of challenges. I am going to ask her to say one or two words.

**LYNNE JONES:** When I indicated that I wanted to say something it was not really about that, other than to say that we have got some excellent research going on in our research institutes and we must protect those and expand upon them. I would not like people to get the impression that there is not a lot of good, high quality work going on. I think that needs to be an important part of this inquiry.

I recently went to Brazil on behalf of the Committee and it was interesting to see the really high importance they are giving there to their agricultural research base. The EMBRAPA organisation started off in 1974 with about 20 scientists and they did get a lot of help from this country and now they have got 8,000 scientists, and I forget the exact number of PhDs. They have got 39 research institutes and are about to open another three. We need to take note of the importance that they are giving to that.

I wanted to ask a couple of questions and I suppose it is relevant to the Brazil issue. Obviously one of the worries is the deforestation of the Amazon as a result of the production of beef and soya, for example. Chris raised the issue about why are we denuding our uplands and then having livestock production based on imported animal foods which potentially has environmental consequences. What are the drives to that? I spend a lot of time in the Welsh uplands and farmers there are struggling. I know that lamb production in our uplands has gone down substantially. We have gone from a situation where we probably had too many animals on our uplands to currently having insufficient. What has driven those trends, if people would like to comment on that?

My final point is on the culture. Jenny mentioned talking to parents in the playground and about amazement at the idea that we should cook a meal from scratch. We have gone a long way from when I was brought up and the cabbage was boiled for about three hours before you ate it. Our standards are much higher in many ways and there is enormous interest in food, all the TV programmes, all the celebrity chefs, yet we are not cooking at home. How have we got ourselves into this situation? I get great pleasure out of cooking and I cannot understand why people do not enjoy it and do not do it. We have got the Jamie Oliver Ministry of Food, perhaps we should look into that in terms of what needs to be done to change the culture.

**MS LINFORD:** It seems a chore, which is very sad. People who do not do it do not even want to do it. (a) they do not have to and (b) they have no desire to. It is very strange for the parents. I really like to know what I am putting in my child’s mouth and when I look at a packet label I think, “I’ll just cook it myself”. It seems that is quite a fruitful route to tap into, the desire of parents who love their children, which is all of us, wanting to get into the idea of good food being made at home, which is quite potent.

**THE CHAIRMAN:** Just before I bring Peter in, last week I went to a presentation by one of our leading supermarkets on their supply chain and they had one of their butchers along to show us about different cuts of meat. This was in the evening and after they had done this, they turned round and said, “Right, there you are, get on and cook it”, so I am afraid it was back to the kitchen even for this humble Member of Parliament!

**MR KENDALL:** On why production is falling, it is bizarre because as we speak there is promise of a new WTO deal taking into account no non-trade issues, ie environmental and welfare concerns, so we have lower trade barriers. In the EU mostly—the French will not do it—we are removing production link support, so where you now have a payment for managing the land rather than production, and in this forum I will be quite controversial, I believe we do need to think about how we do want the market to give that steer. As a farmer, I do not want politicians and bureaucrats from Brussels deciding what I should and should not grow, that is a dangerous avenue to go down, but we are. The declines you talk about are the result of that change in agricultural policy from one that was paying you to put as many sheep on there as possible to one where you put the right amount to produce the right quality for market.

Can I just reply on research and development. There is a 20 year payback in agricultural R&D and that is why it is different. We are talking about having to give incentives. As an organisation we fought to get the Agriculture and Horticulture Development Board to work closely together. There is a £56 million pot there that goes into promotion, market failure solutions. We want them to collectively find ways of putting that money together, so the industry shows it is putting its money where its mouth is. We

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11 December 2008 Mr Tim Lang, Mr Chris Brown, Mr Peter Kendall, Ms Jenny Linford, Mr Jan McCourt, Ms Hannah Devlin, Ms Annette Pinner, Mr Johann Tasker and Ms Clare Oxborrow

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would encourage the Committee to look at incentives. In the same way as you reward venture capitalists or people who speculate in theatre productions in the City, you get additional tax breaks because you are taking a very long term position and they are high risk and often only very few come home to give you a dividend.

**THE CHAIRMAN:** Is there anybody from the audience? I see two more hands and I know David Drew wants to come in. Time is going to be fairly tight on this. I am going to take the lady at the front, the gentleman at the back and then I see a hand right at the back. Perhaps you would be kind enough to do them one after the other and then the panel will respond and I know David Drew wants to make a brief comment. Lady here in the second row.

**MS PINNER:** Thank you. My name is Annette Pinner. I am from the Vegetarian Society. For me, a really high priority is this fundamental question of behavioural change and what we should eat to make the best use of our resources and how that can be dealt with, especially as some of the conclusions are very likely to be unpopular. I am thinking of Tim's examples of pineapple and apples, but obviously from the organisation that I represent meat and dairy as well. How are we going to move away from what seems to be the underlying principle that there is a demand that must be met to actually working more in harmony more consistently with what our land can supply?

**THE CHAIRMAN:** Thank you very much indeed. The gentleman down there on my left-hand side.

**MR TASKER:** My name is Johann Tasker from *Farmers Weekly* magazine. This question is to Peter Kendall, Tim Lang and Chris Brown. There are people who think we should be more self-sufficient or less self-sufficient and the question is how self-sufficient in percentage terms should we be in the indigenous foodstuffs, ie the food that we can grow in this country?

**THE CHAIRMAN:** We will park that one for the moment and take the final question from the lady at the back.

**MS OXBORROW:** Clare Oxborrow from Friends of the Earth. I just wanted to pick up on something Lynne Jones said about deforestation in Brazil to grow soya because, of course, this is a significant issue not just for biodiversity loss but also for climate change. I think when we are considering food security for the UK we also need to consider what impact our consumption is having on the ability for others in developing countries to meet their own needs in terms of food supply and the significant use of soya for the livestock sector is one really big issue where this all comes together. It will be really interesting to hear comments on that.

**THE CHAIRMAN:** Clare, perhaps you might like to remind everybody of the name of the campaign you have just launched?

**MS OXBORROW:** Thanks. We have just launched a new campaign called the Food Chain campaign

and we have a new report that is called, *What is Feeding our Food* looking at the impacts of the livestock sector.

**THE CHAIRMAN:** Very good. Let us just take, if I may, the specific question that Johann put from *Farmers Weekly*. I will start in the order which he put it, which was Peter Kendall and then Tim Lang and then Chris.

**MR KENDALL:** You heard what I said earlier on about an early warning system and I deliberately do not put targets on it because if you put targets on it then you would have politicians and bureaucrats managing that outcome, and that has not proved successful in the past and I suspect it will not be again. The point I made about an early warning system is it does point the finger back at regulators, it does point the finger back at trade policy or even EU policy. If we are going to see our sectors decline because we bring in foreign products produced in a low welfare environment then we have issues with the supply chain and how the relationships work with some of the big retailers. I do not want to set targets but I do want us to drill down and see what is causing the success or failure in helping to stimulate a successful sector.

**MR LANG:** I will deal with Johann's question about home grown and indigenous. As you know, we are about 70% home grown production and indigenous products at 60%. By its nature I would say we should be raising that. I do not see why we should not be eating only British apples. I do not see why not. I know why we are not, it is because we have not got the apple trees and we took the CAP grants to grub up our fruit trees, et cetera. We all know what went wrong, but to rebuild and re-skill that will take time and will be expensive. Do I want that to happen? Unequivocally, yes. It goes back to Jan McCourt's eloquent plea for production and culture to get closer. Here's an example of how you do it, or this has to be part of that. Am I happy to see the production graph going down? No, I am not, for the reasons I have said, not out of petty nationalism; I am very happily British. My concern is for appropriate and sustainable land use. A new agenda is cutting across what has been a highly politically charged debate. We have to use land everywhere appropriately and sustainably, whether we are talking about Brazil or Botswana, Malawi or us. To allow your productive land to drop, as we are doing, is immoral.

The second question from Annette Pinner about the behaviour change, I think your question was a statement. As you know, I agree because I have said very much the same thing. Behaviour change is already happening. A culture that has shifted people in just 30 years to where children think pizza and curry are British foods and are their favourite foods can deal with behaviour change. I do not think we should be frightened of behaviour change, the issue is what has been driving it and how can we drive it in a more sustainable, equitable land use.

Clare, on your point, although you did not ask it specifically of me, the issue of soya and livestock is an indicator of a meat culture that has gone barmy.

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11 December 2008 Mr Tim Lang, Mr Chris Brown, Mr Peter Kendall, Ms Jenny Linford, Mr Jan McCourt, Ms Hannah Devlin, Ms Annette Pinner, Mr Johann Tasker and Ms Clare Oxborrow

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I am actually a great fan of the debate that the FAO Livestock's Long Shadow Report two years engendered. These very important figures, both globally and also here in Britain, are of us growing and using very important agricultural land to grow grains that we could be eating, and arguably should be eating, to feed to animals. It is a very inefficient land use.

People like me are dusting down 1960s and 1970s' academic research about efficiency and conversion ratios and saying this logic is back and it is back in an era of climate change and water shortage. All of your three questions were the same sort of question. It comes to the point that I hope appropriately, Michael, I was trying to say, that behind the production question that the Select Committee inquiry is going to address is this very difficult word of "appropriate". We have got to nail down what is appropriate land use because it is actually needed.

**MR BROWN:** What is left? As somebody else has given the number I will not as well other than to give an example. The scientist debate has steered away from demand economies to command economies and that is a really interesting thing to explore. If you take the apple example, the customer is now telling me that they want red-skinned apples. Gala apples outsell, that is what they want to buy. It has taken time but we are actually seeing increases in British red apples coming through, and that is the way the market should respond. By the same token, there was an interesting debate which the Committee might like to explore about what is our strategic reserve in terms of production and how much are we going to say, "We need to hold this as our national bank account"—maybe banks is not the best example to use—but also to flex in terms of what the market and customer is demanding.

**THE CHAIRMAN:** Time has beaten us. David, I know you just wanted to make a quick point and then I think we are going to have to wrap it up.

**MR DREW:** It will be very quick. I am pleased that we got on to the issue of demand because we spend a lot of time talking about supply, so I welcome that. The second point is we had the Curry report, not the big one but the small one on county farmers, which has virtually disappeared without any trace. Again, there are some issues about access to the land for people who want to do some interesting things. I know Tim has talked and written about this. There

are some real access issues to do with where we may be looking at slightly different arrangements on how we produce and subsequently prepare our foods. I hope we can look at all of those, Chairman.

**THE CHAIRMAN:** Well, Members of the Committee are the ones who ask the questions and help to set the agenda, so I think the answer on that is an unequivocal yes.

Can I thank our four speakers who have helped us in such a stimulating way to launch this inquiry. If nothing else, it has revealed not only the passions but the complexities which are involved when you come to talk about food which I am afraid we do tend to take for granted. In the United Kingdom for a long time it has been left to the buying directors of companies like Asda, the procurement directors of companies like McDonalds and manufacturers like Northern Foods, they are the ones who have decided in many cases what food policy is going to be. Recent events perhaps have given back ownership of that particular debate to the consumer, to us. As a group of, if you like, the people's representatives, we are going to pick this up and run with it. We will do our best to try and ask the questions which very usefully have been posed both in the questions from the audience, for which I thank you all very much indeed, and the challenging points that our four speakers have made. Thank you all very much for coming and launching this particular inquiry in a genuinely novel way for the Committee.

If you have been stimulated and feel you want to make a further contribution we are always able to have written submissions. They do not have to be long, they can be sent electronically to the clerk of the Committee, but the most important thing is they will be read and will form part of the evidence which ultimately will be published as part of our final report.

The one thing I would say about the Select Committee's work is that it is a genuinely democratic process, we welcome all contributions. Sometimes in those contributions there will be a little nugget that we certainly will not have thought about but which you would make as a significant contribution to our efforts.

Thank you once again for coming. Thank you very much to Borough Market for allowing us to use this splendid facility. We are now going to go off to Jan's stall to enjoy some breakfast! Thank you very much indeed.



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## Wednesday 28 January 2009

Members present

Mr Michael Jack, in the Chair

Mr David Drew  
Mr James Gray  
Lynne Jones  
David Lepper  
Miss Anne McIntosh

Dan Rogerson  
Dr Gavin Strang  
David Taylor  
Paddy Tipping  
Mr Roger Williams

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*Witness:* **Professor Tim Lang**, Professor of Food Policy, City University, gave evidence.

**Q1 Chairman:** Ladies and gentlemen, may I welcome you to the first evidence session in the series to open the Committee's inquiry into securing food supplies up to 2050: the challenges for the United Kingdom. The Committee launched this inquiry at a meeting in Borough Market—I think it is the first time that we have ever called a public meeting to launch an inquiry, but I think that went very well; and it was certainly helped by our first witness here today, an old friend of the Committee, Professor Tim Lang, who is the Professor of Food Policy at the City University. He is well known to anybody who follows food matters; he is a regular broadcaster and commentator in this area and I am delighted that you are here, Tim, to help us in our first evidence session. Looking to the future, I am very conscious that in terms of the outcome of the World Food Summit in June last year, in Rome, two targets were set: one that we should have as a globe 50% increase in food production by 2030 and that by 2050 we should have doubled our food production. It may sound like a long way off but it is amazing how quickly time passes. Perhaps I might open the batting by asking the question because what we are trying to do in the first series of our inquiries is to identify what are the challenges, what are the things that are on our list that we have to attend to if the United Kingdom is to make its contribution to hitting those two targets. So what threats in that kind of scenario timescale do you see that we have to address if we are to have a secure food supply along the timeline I have identified?

**Professor Lang:** It depends what you mean by threats. One of the problems with the notion of food security as you know, we all know, is that it means all things to all people. The issue is who is the "we" and what is the threat and how do you define what you mean by food security? At one end you can have, if you like, a military approach, of food resilience—not that they colonise that word but you know what I mean—and on the other hand there is a notion of food security which says that the only way we can actually produce the right foods by 2030 and 2050 is by sustainability. They are rather different approaches; one is concerned about buffer stocks, stocks—do we have we five days or eight days or is it only three days in the pipeline down motorways; and the other is saying how can we protect soil and water in an era of climate change and deliver public health? So my answer is actually to bat it back to you. I think one of the problems and one of the

things that I would very much welcome from your inquiry is some clarification of what do we mean by food security because it means all things to all people. To answer that problem myself I think we have to clarify what level of production we want to have in Britain or the UK and how could we deliver that and at what environmental cost or not cost; and for what purpose? Is it just to ensure that we are okay or is it to deliver public health gain? Or is it to deliver cheaper food or is it to deliver enough food, it does not matter whether the costs go up? There are some complicated issues of political objectives behind your question.

**Q2 Chairman:** Let us focus for a moment on what Defra says. In the *Ensuring the UK's Food Security in a Changing World* discussion document published in July last year in one of the conclusions they reached on this subject they said: "One of the most important contributions the UK can make to global, and our own food security is having a thriving and productive agriculture sector in the UK, operating in a global market and responding to what consumers want." Does that strike you as a rigorous statement that the government know what food security is?

**Professor Lang:** No, I think they do not know what they want.

**Q3 Chairman:** Have you read nowhere in any text from the government—

**Professor Lang:** Nowhere.

**Q4 Chairman:** . . . that delights your fancy?

**Professor Lang:** No. Firstly the 2006 Defra statement and the 2008 Defra statement were, if you like, the classic: "Do not worry, we are a rich country, we can buy on world markets; we can afford to feed our people; there is not a real problem of food security." That is the classic Defra/Treasury line. Then you start getting things like the December written ministerial statement to try and clarify this, which said, and I quote: "The majority of Respondents to the July consultation paper . . ."—from which you were quoting—"said, 'We should not base our food security policy on the pursuit of self-sufficiency.'" And the written ministerial statement went on; they proposed in fact a more complex process—quote: "It seems clear that food security is most usefully looked at in terms of the resilience of our food supply chains, access to safe, nutritious, affordable and diverse foods and

28 January 2009 Professor Tim Lang

ensuring the long term environmental sustainability of the food and farming sector. The UK's food security is strongly linked to global food security." That is quite interesting. Then Mr Benn, the Secretary of State, in his speech to the Oxford Farming Conference exactly a month later made the following statement—and I quote: "The best way for the UK to ensure its food security in the 21st century will be through strong, productive and sustainable British agriculture, and trading freely with other nations. And just so there is no doubt about this at all, let me say the following. I want British agriculture to produce as much food as possible. No ifs. No buts." I think you see there an illustration of exactly what I was getting at. It sounds clear but then there is a bit of "We will leave it to trade"; but then Mr Benn's statement in January—"No ifs. No Buts," which has been much cited. I still do not think we have a clear, concise commitment to stopping the decline of British food consumption, production of foods which could be sustainably produced. That is what I personally think we need; we need a definition of food security which is linked to sustainability because ultimately the only secure food system is one which is sustainable. So we have to have sustainable development as a goal at the heart of whatever we mean by food security.

**Q5 Chairman:** Interestingly, when the Secretary of State came before this Committee I asked him what was the current priority for the Department now that climate change had gone to the new Department of Energy and Climate department, and he hesitated just for a fraction and then said "Food", and it was as if after a long period of time his department had re-engaged—

**Professor Lang:** Rediscovered food.

**Q6 Chairman:** ... to play a key part with the department's name. Perhaps you might give us your views about how well Defra has performed as a department, which has had food in its title since its inception, and whether because it has now suddenly, if you like, re-engaged with food is it doing it from the point of view of a modern, forward looking idea of what a department in government should be doing about food issues, or is it coming at it from a slightly retro point of view?

**Professor Lang:** I think that is a very good question. A short answer—I will be very harsh—I think it is making some very good and to be welcomed moves to connect production and sustainability but it is not doing it dramatically enough and quickly enough. I do not think it has yet quite got the sustainability of food message; that is the heart of what I think it should and could be about. But compared to, say, 20 years ago and the old MAFF, I think Defra is very definitely a step in the right direction and I would not like us to lose sight of that. Those of us with long memories who have looked for a long time at the food system and how government and governance of food occurs, Defra undoubtedly is allowing a

more complex notion of the criteria by which you would judge a good food system to creep into public policy.

**Chairman:** You hinted in your answer earlier that there is a lot of potential to produce more food in the United Kingdom and you touched on, in your last answer, the role of Defra in realising that potential. Perhaps as we go through perhaps you could, in reply to colleagues' questions, say what elements Defra should be picking on to ensure that we do have a thriving food sector up to 2030 because, in closing, I am just very conscious that for a long time now—if you like, in post-war Britain—we have gradually subcontracted the supply of food to the non-government sector, so that supermarkets, food service companies and food manufacturers take the day to day decisions about what arrives here for us to have on our plates and Defra has somewhat rowed back from that. Perhaps part of our discussion says how much should it re-engage with an agenda from which it has been absent. Before I move on, David Drew.

**Q7 Mr Drew:** Can we go one stage further that this is, in a sense, the epitome of Europeanisation because in food there is a federal policy. It may be that that is not always seen through in every country but in no other area has there been the same history of the European movement, if you like, in actually trying to design a policy which may not be one size fits all but it is trying to make one size fit as many different types of food system as you can possibly incorporate, and that must have had a profound impact on the way that government operates.

**Professor Lang:** I submitted through the clerk's office to you a couple of reports that my colleagues at the Centre for Food Policy have done recently.<sup>1</sup> One of those reports makes it very clear in fact that although there is a decline and, I think, a rather worrying and unnecessary decline in home production of food in the UK, the bulk of the sourcing of the food that is imported comes from other European Union members, in which case the issue that you are raising is critical, which is that if we had a notion of food security it must be at the European level. One of the things that my colleagues are championing is a view that there is a new direction for the Common Agricultural Policy to become a common sustainable food policy and that that actually offers the UK Government very beneficial points of engagement with other Member States, with which over food and agricultural matters, frankly, it is seen as an outsider. What that also means is that it is very complex—back to the Chair's issue before handing over to you, Mr Drew—that there has been a tacit handing over of responsibility for food policy and food security generally to the corporate sector, yet the corporate sector cannot possibly resolve it because it has been driving efficiencies into the market place through the supply chain as its number one goal to try and drive down prices for consumers. That is the long term 60-year task it was given after the 1947 Agriculture Act.

<sup>1</sup> Not printed

28 January 2009 Professor Tim Lang

Decline in food prices means more money to spend on other things. That level of policy is now being set at the European Union level, in which case Britain has to engage with that. The corporate sector actually, through its contracts and specifications, does have a very tight control over its supply lines, but it is doing it in order to maximise efficiencies within those supply chains; what it is not doing is looking at the big issue, which I think follows from the sustainability approach to food security—water, the energy dependency, the oil dependency in particular, which is showing up in fertiliser costs and so on—all those issues that in our report we call the new fundamentals. Those also are addressable at the European level but the British Government could take more of a lead on. So we have the problem in food security which is general in the food policy area of multi-level governance of who has responsibility for dealing at different levels of governance with delivering the appropriate outcome.

**Q8 Dr Strang:** You have spoken of a moral responsibility to maximise food production appropriately.

**Professor Lang:** Because of land use.

**Q9 Dr Strang:** So the question is, should we be producing—“we” being the UK—more food?

**Professor Lang:** Forgive me for interrupting you. Not at all costs. That is why I came back—and I want to stress it again—we need a proper definition of what do we mean by food security; it is too plastic—it means all things to all people. We must have a new national definition of food security, what it means and also what our position is within that. To answer your question within that context, it is about land use. I do not think that anyone I know at all or have read ever thinks that we should be producing mangoes, papayas, pineapples or bananas. In theory you could do so, but what is the point? The point is to produce as much and as appropriately and sustainably of what you could produce. In both of the reports that I have given to the Committee we have stressed the issue of fruit. We are actually producing a huge amount of cereals—a large amount goes to feed animals, let us put that to one side—but only 10% of the inadequate levels of fruit that the British are consuming is produced in Britain; we could be producing an awful lot more apples and pears. So my answer to your question is in general yes we could and should produce more food but we need to be specific about which foods and how, but there are some areas of food production which warrant high priority. I think horticulture is crying out for extra production; it is ridiculous that a country that has 1,900 varieties of apples in the national collection of Brogdale produces almost none of the apples that are consumed in Britain, at inadequate levels of public health consumption. As we know, we should be consuming five portions of fruit and vegetables a day—actually, many of us think it should be seven, eight or nine—and we are only consuming about 2.3. If you translate it into those levels there is a missed market. So the question you are asking is a

fundamental one and I think that although Mr Benn’s statement to some extent was to be welcomed it was merely a speech; it was not coordinated policy driven by Defra to encourage the big corporate powerhouses, the supermarkets, the buyers, to take the long-term investment to encourage farmers and growers to plan. Then there are the other problems that follow from my answer, which is issues like skills and can we do it.

**Q10 Dr Strang:** Thank you for anticipating my second question, which was going to be to ask you what we should we concentrate on producing and you have given us an answer there, so (a) would you like to add to that; (b) would you like to say something about how we should go about encouraging that production?

**Professor Lang:** A: I work in a public health department. Even if I did not you would have to say that a good food security policy has to deliver public health goals while looking after the land to enable it to be used for long term, for future generations—that is the overarching goal. I have said already that I think fruit and vegetable consumption ought to be prioritised. In one of the reports that we gave you we showed our extreme concern at the precariousness of British horticulture, the science, the R & D base for supporting that is problematic. The skills on the land, as you know from your former roles in government let alone outside, are immensely sophisticated that need to be put in place. So it is not just saying, “We want more fruit and vegetables,” but the issue is how and do we have the right infrastructure, do we have the right skills base? Not just at the science and R & D level, but in fruit do we have enough people trained in grafting, pruning? You cannot just plant orchards you have to run them and who is going to do that? At a time of job insecurity and jobs going agriculture and land offers a huge opportunity for long term employment.

**Q11 Chairman:** Are you doing anything on Sunday afternoon because I could do with a hand on my allotment to dig in the remainder of the manure—I am doing my bit!

**Professor Lang:** I know you are a keen allotment holder—I am too busy doing my own!

**Q12 Dan Rogerson:** I will come back to an issue that you parked in your last answer, which is about livestock and there is this question of sustainability and where we should be going and all the rest of it. What is your view for the future for my constituents in Cornwall and what do you think food policy is doing?

**Professor Lang:** This is contentious but I have to say it—and you know I am going to say it, probably—the strong evidence on climate change, greenhouse gases emissions alone is that we need to reduce meat and dairy consumption—and note I say consumption. That therefore implies that we have to reduce production. Again, it is back to who is the “we”. If British dairy production went down or meat production went down would the British consumer demand it and merely get it from elsewhere? So there

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28 January 2009 Professor Tim Lang

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is a production and consumption balance and imbalance proper, which I merely park back. I think it is and it has to be addressed—actually Britain is producing too much meat and dairy and we should lower it if we want to, in line with the Stern Report, in line with all the scientific advice, and treat meat and dairy as one of the quickest and most fundamental ways in which we can lower our carbon emissions, our greenhouse gas emissions through food, which is what Stern called for. We cannot make an omelette without cracking eggs—we have to grasp this. In your constituency—I should have checked I cannot remember exactly the terrain, the topography of your constituency, but let us stick to Cornwall—Cornwall used to be a main producer of potatoes; the potato production has dropped. It used to be a main producer of herbs—it has dropped. It used to have a very large agricultural and field . . .

**Q13 Dan Rogerson:** Cauliflowers.

**Professor Lang:** Cauliflowers, exactly. All of those markets ought to come back with more diversity. The British public, the consuming public has become more literate, more omnivorous in what it eats; it is used to a wider variety of fruit and vegetables. Terrific. Allotment growers, gardeners know only too well we can grow them but they are not being grown in field circumstances. I see a completely beneficial and new role for clutches of agriculture, for further education, for skills enhancement to work with and revitalise farming and growing in Britain. Your constituency is classically in a wet part of Britain where it is seen as only meat and dairy can come out of it. Historically, not true. Also climate change will make it probably less true.

**Q14 Dan Rogerson:** You have answered one part of it but what should be happening with the land if it is not doing livestock, in your opinion. Mr Drew earlier on was talking about the European context. If we are talking about things across the whole of Europe—and climate change will obviously lead to other areas where perhaps livestock and dairy are even more impractical and marginal and hard to justify—do you think that that will have an effect and therefore the sorts of things we are talking about, about whatever we might do with our diets in terms of exports and so on, will have an effect?

**Professor Lang:** It is, and I know that your next witness is John Beddington but if you had the Chief Scientist of Defra, Bob Watson, who was the Chief Scientist at the World Bank, he would give you extraordinarily complex and persuasive data on the need to address the issues that I have been talking about, and that Britain has a moral and political responsibility as co-signature to Kyoto, etcetera etcetera, let alone what happens in Copenhagen at the follow-up to Kyoto to deliver on that. I think what I would like from Defra, why I am broadly sympathetic to Defra but want it to do more and faster is because I think this is an example of what I would want from Defra. I would want it to be working in Suffolk, in Norfolk, in Cornwall, in Yorkshire, in the mountain areas of Wales to say,

“How can you do your bit to address greenhouse gas emissions?” It would be different answers for different locations.

**Q15 Chairman:** Before I bring Roger Williams in I want to pin you down a little bit because what you have done is to paint the picture of potential, but you have also been saying that Defra’s current descriptions of what food security is are not detailed enough. I am reminded from the government’s evidence to this Committee that they said that the government’s definition of UK food security is for people to have access at all times to sufficient, safe, sustainable and nutritious food at affordable prices so as to help ensure an active and healthy life. In your response you started to say that there were certain things we ought to diminish the production of and other things we ought to increase the production of. That is a fairly general statement which still says that people can have basically what they want when they want and at whatever price that they can afford. How would you make that more specific? If you were given the task of redefining it what would it look like?

**Professor Lang:** What would the farming look like or what would the diet look like?

**Q16 Chairman:** What would the definition look like because I am interested to know how far you want to get Defra to go beyond the statement of the general? Does it have to become more prescriptive, more directive, more interventionist if it is going to achieve the level of detail and the definition that you would be happy with?

**Professor Lang:** That is a good question. The answer is I would like it to be more prescriptive. I think it does not need to impose that but I would like it to give a new direction of travel. I do not think it has been clear enough in saying what is a sustainable diet and how can farming and horticulture help produce that and what is the mismatch? That is actually the information we need to have but we can only do that if Defra grasps the nettle, if it will say let us take some specific—

**Q17 Chairman:** I am going to give you some homework because I know you normally give your students homework and so I hope you do not mind if I give you some. Would you like to, after this is finished, let us have your definition. If you were saying to Hilary Benn, your student, “Mr Benn, go away and write down in more detail what you mean by that?” could you write in the answer?

**Professor Lang:** Yes, I will.

**Chairman:** Thank you very much.

**Q18 Mr Williams:** You have clearly laid out how you would like agricultural production to be modified to have a healthier diet and we have heard you on that theme before. We have a little prompt here which says how should such production be encouraged because at the moment farmers are being told to respond to the market place and the market is saying “We want more high quality meat and dairy,” and the policy at the moment is not to encourage any

28 January 2009 Professor Tim Lang

particular sector of agriculture but just to ensure that the potential for production is secured for the future. Are you saying now that the government should intervene in the market place and to try to say to farmers, “Do not produce what the market wants, produce what we want, what we have decided is the best”?

**Professor Lang:** I think the short answer is that you cannot do it that way any more and attempts to do that in the past have only both been experimented with and also delivered in wartime circumstances; in other words, when the framework of existence has given governments legitimacy to do that. You could not do the scenario that you have just sketched. The only way we could get the change from the situation we are in at the moment, where we have a high carbon unhealthy diet, high carbon unsustainable food production system from farm to the point of consumption, is that we have to shift that to something which ticks all the right boxes. The only way we will be able to do that, the Sustainable Development Commission argued in its now very classic report *I Will If You Will*, is by getting government to take the lead, working with industry and the supply chain but ensuring that consumers both are with it, are pulling it and also being pushed. You have to have a mutual work across the triangle of change. No one can impose on any one corner of the other corners of the triangle. There has to be a virtual circle going on. But back to the Chair’s initial questions, what I think the role of government is about—this is my opinion—is that government is about setting a direction of travel; it is not imposing that, it is saying broadly “Dear Britain, dear food supply, dear consumers, dear companies, we actually have to shift from the position that we are in at the moment to over there and the only possible way that we can do it is by working together but we have to do it very fast indeed. The greenhouse gas emission levels have to come down, or else it is bye-bye to climate change stabilisation.”

**Q19 Dr Strang:** We are going to pursue this about encouraging has to be the fully maximised production of where we are self-sufficient.

**Professor Lang:** Where appropriate.

**Dr Strang:** Yes, where appropriate. I think you have covered that.

**Chairman:** David, is there anything that you wanted to add on that.

**Q20 Mr Drew:** I am interested with this idea of how you put all this together. That is the problem with food policy.

**Professor Lang:** It is, yes.

**Q21 Mr Drew:** It is a massive jigsaw puzzle where government is, as you say, in control of it and so again going back to your student, Mr Benn, in your first lecture to him you are going to give him this map and how would you address the start of the map?

**Professor Lang:** I think there is good news here and I really would like to emphasise it because I know you know it but I want to say it to make it absolutely clear that you know I know it. I think these

arguments that I have been articulating, essentially the plea that policy listens to evidence, there is a gap between policy and evidence, it is quite common as we all know, but there is the beginning of a political response to address that gap. I think the Cabinet Office report, the *Food Matters* report was very significant. I declare an interest; I was an adviser to it. It was highly significant, not just because of what the report concluded—it said that the British food system essentially must aim for a low carbon but healthy food supply. That has not been stated as starkly as that before but what was significant was that it mapped out a political process to deliver it and the Cabinet Office Domestic Affairs sub-committee (Food), with the wonderful acronym DA(F) is now beginning that task. It is the ministerial sub-committee, chaired by Mr Benn—he is in the hot seat—that is actually beginning that process, we understand. At the civil servant level that process also needs to happen. It must happen across Whitehall, it cannot just be left to Defra—back again to the Chair’s question. Even though I personally would like Defra to be the lead and it is seen by the Cabinet, I understand, as taking that lead, it cannot deliver a coherent food security sustainability policy—call it whatever we will—unless it is also dealing with the Department of Health, the Food Standards Agency, DFID, the Treasury. It must be cross-sectoral or else it will not resolve the problems that we have. So to stress the answer that I am giving to you I think a political process is beginning but it has to go very fast; it has to go very fast indeed. It has to not just happen in Whitehall but engage with the big players in the food sector. It has to set up regional activities so that farmers who do not deal exactly with the Domestic Affairs (Food) sub-committee know what the direction of travel is that British food policy wants. But there is good news that the political process does seem to be beginning. I think that is good news.

**Q22 Miss McIntosh:** I am slightly concerned by the direction of travel that you are proposing. I represent the largest livestock producing area currently in the Vale of York. We fatten the cattle that are born in the hills and then come down and I think that Thirsk is the largest or joint largest fat mart in the country. So bearing in mind that we do have to produce food to higher environmental standards I personally would not advocate coming out of livestock production. Particularly for girls as they are growing up—there is no substitute for red meat giving them all the vitamins and the blood count that they need. So surely there are other ways we could look at producing a low carbon food production by encouraging people, as you are saying and as the government is saying, to eat more locally produced meat. So surely we should be looking at labelling better and eating more locally produced food rather than stopping livestock production.

**Professor Lang:** I take your point about the last point and I will respond to that last point and go backwards into your first, beginning point. There is considerable confusion among consumers, research shows, about what is the local—is the local British or

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**28 January 2009 Professor Tim Lang**

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is the local within 20 miles? Studies done for companies that I have seen, on a confidential basis let alone public studies, show an amazing variation of what people mean by the local. That is an example that Defra ought to nail—what is local food? At one level you could have it designated as within 30 miles, say—the Farmers' Markets movement has made that sort of attempt, 30 to 50 miles. So I think that there is clarification that is needed there. Back to your issue of meat, of course you can lower the carbon load or the greenhouse gas load of a diet without tackling meat but you will not tackle it very much unless you do tackle meat and dairy. Meat and dairy are at the heart of the need to reduce greenhouse gas emissions. My point is, as an ex hill farmer, which I ought to say, I can see a role and a place for meat production on the hills—what else can you do with them? The history of meat production in East Yorkshire was because of proximity to cereals land to the foods that were grown to enable fattening of animals quickly. The 21<sup>st</sup> century model of agriculture is going to have to be something very different. I understand the historical legacy—back to Cornwall—that all the areas of the UK have, but the 21<sup>st</sup> century is going to require a suspension of that not least because climate change is going to change it anyway. So I do not see the future of Thirsk as remaining in meat even if it is there now.

**Q23 Miss McIntosh:** I think that would be something that we might disagree on.

**Professor Lang:** I am sure.

**Q24 Miss McIntosh:** In your view what constitutes a sustainable food supply?

**Professor Lang:** This is the sort of thing I want Defra to actually nail down. We have strong evidence on climate change—not just carbon but all the greenhouse gas emissions. We have strong evidence on nutrition; we have strong evidence on energy use; we have strong evidence on the great family of issues that we can lump together as ecosystems—soil, water, etcetera—a whole variety of environmental, quality, health and social issues. My own definition, which I will happily send in response to what the Chair asked me to do, groups what we mean by a sustainable food system and what a sustainable diet must address under those four headings—environmental, health, quality and cultural issues and then the social/ethical issues. So I think we can actually see the beginnings of an emergence of what I have called with colleagues an omni standards approach to food. Even if we have not yet in Britain defined what a sustainable diet is or a sustainable food system is we now have very good evidence about what the criteria are by which we should judge one. So I think we are a bit like the political process in my answer to the previous question; I think we have the beginnings of what can be turned into a definition of a sustainable diet and a sustainable food system. We now know that you could not have a 2050 food system that ignored carbon; anything that ignored carbon would be stark raving irresponsible and flying in the face of evidence.

Equally, for a food system not to deliver the requisite mix of nutrients would be flying in the face of 100 years of epidemiology and nutritional research. So we have some very, very strong evidence bases that we can throw into the policy pot.

**Q25 Miss McIntosh:** I would argue that meat and dairy products that are produced locally, within whatever definition the government might come up with, are both the most sustainable and the healthiest products. How are you going to meet the sustainability target if you are taking products which are not grown locally, so by definition have to travel further, so that you are increasing the food miles and are probably not as healthy?

**Professor Lang:** Let us deal with the sustainability issue as food miles. The distance that a food travels can add to its carbon load, it is clear, but long distance food is not necessarily the highest carbon loading of the food. There is pretty good evidence that seasonality is a factor that cuts across it. If you want the classic Defra study of the long distance tomato it is better to have a long distance tomato grown under the sun in Spain in terms of its carbon load than having one that is under a greenhouse, gas or coal fired or whatever, artificially heated greenhouse grown locally, so the local may actually be inappropriate. But if you are saying that an out of door sun grown tomato in Thirsk, in which case the window of growing will be fairly narrow, would probably be—I have not seen a study that has done this—a lower carbon than one that is grown in Spain and then trucked from Spain so the local may be better, you are quite right. Let us get back to your issue of meat and dairy. No one in public health and nutrition that I know of is arguing that there should be no meat or dairy. The issue is how much and then the sustainability argument of how is it produced? If you have meat three meals a day, seven days a week this is going to be a very high carbon diet. If you have meat infrequently—special occasions, feast day food not every day food—it can take a place in a sustainable diet, no issue about it. Sustainable is not just healthy, remember, but greenhouse gas and the other criteria. So I am not arguing a case—I really would like to make this clear—against meat and dairy full-stop. I do not eat meat, although I used to be a vegan sheep farmer.

**Q26 Miss McIntosh:** Can I ask a very personal question, is that where you are coming from?

**Professor Lang:** Me personally?

**Q27 Miss McIntosh:** Yes.

**Professor Lang:** No, I am looking at the data. Just go and look at the data, the IAASTD or the climate change data on meat—we have to reduce it. The excellent, huge study—and if the Committee does not have that I urge you to read it—the *Cooking Up A Storm* report, written by Tara Garnett at the University of Surrey, the *Food and Climate Research Network* report, is a sensational summary of all the data. There is just no way, it seems, that we can get away with not having to reduce meat and dairy

28 January 2009 Professor Tim Lang

consumption from our very high levels—we the British. The Americans' is even higher than us. It is a difficult, tricky issue, I accept.

**Q28 David Lepper:** Meat and dairy on the one hand and there is you, Professor Lang. The government places a lot of emphasis on healthy eating.

**Professor Lang:** It does.

**Q29 David Lepper:** It tells us about five a day and all the rest of it and what we should be doing. You are talking both about that and sustainable eating as part of a sustainable food policy. How do we change consumers' preferences, our preferences, Anne McIntosh's preferences?

**Professor Lang:** With great difficulty, in case you thought I was on Planet Zog! With great difficulty. But the interesting thing is that there is great appetite to change. The surveys that I see show the public saying that actually they want to address climate change; they are becoming extremely concerned about it. Again, back to the Chair's initial push to me, I think this is a role where Defra ought to be leading; it is not something it can hive off to the Department of Energy and Climate Change. It has to see that food is a leading opportunity to address the issue of climate change in people's ordinary lives because the Stern report showed the IAASTD report showed, the Tara Garnett *Cooking Up A Storm* report showed, numerous reports have shown and reiterated—and taking the European Union's IPRO study, the Manchester University Sustainable Consumption study have all shown this—that whichever way you crunch the numbers we have to alter our diets. People are very conscious of their diets and their food; they have become literate about the importance of food. So my point is that there is an appetite for change but it is not being helped, and I think part of the reason people are not changing their diets towards a low carbon diet is because they do not know what that means, they do not know what it looks like, they do not have the guidance. It is back for the need for coordination between Defra and the Food Standards Agency, Department of Health, DFID and so on. You have competing messages coming from different organs of government; you have competing messages coming from the supermarket shelf. You walk down supermarkets aisles and it says "Fair Trade" or "healthy" or "low carbon" or "bird friendly" or "animal friendly", these are all single issue competing messages. Actually it is only government that can pull all of those together and say that a sustainable diet looks like winning on these but maybe trading off a bit on that, and trying to minimise what you trade off, to get win-wins across all fronts. But the appetite for change among consumers is much greater than is sometimes seen by the cynics.

**Q30 David Lepper:** So what many of us thought was a good idea at the time, setting up the Department of Energy and Climate Change might not have been such a good idea because it hangs a particular set of labels on the issue of dealing with climate change.

**Professor Lang:** I think that is true.

**Q31 David Lepper:** The synergy that you are talking about becomes perhaps less attainable.

**Professor Lang:** That was always the risk with setting up DECC, as we all know. The truth is whichever way you have government departments you are always going to be cutting the cake in one way or t'other. Government, whichever way we coordinate responsibilities, always has that problem with joining up. Both the challenge and also the excitement of food and this security issue is how do you get all across government to deliver a coherent position. My point is that I do not think the right messages are coming from government to help consumers change, but they have an appetite to do so; they want to eat healthily, they want to do the right thing for the environment but they do not know what it looks like. Food industry studies are showing that already—they do not know what it means. The food industry needs guidance on that. Not even mighty Tesco can resolve climate change.

**Q32 Mr Williams:** You make a case that all meat production is very poor in terms of carbon emissions.

**Professor Lang:** It is high load, not necessarily poor.

**Q33 Mr Williams:** Very high in terms of carbon emissions. Just to take the case of non-ruminants to start with because it is simpler in terms of non-ruminants, but chicken and pig production, they are actually eating plant products that were grown basically that year. All the carbon that was in the plant products has been taken up from the atmosphere that year and released back, so I am not quite sure how you say that it is high in terms of carbon because all the carbon has been sequestered at that particular time. They are not using ancient sunshine, they are using current sunshine. I do not quite follow your argument.

**Professor Lang:** It is not my argument, it is just the data—I read it just like anyone else. All the lifecycle analyses studies have shown consistently and coherently all around the world the high load. The food and agricultural organisations, *Livestock's Long Shadow* report confirms that.

**Q34 Mr Williams:** The data I look at, just talking about the carbon emissions from the production, is not looking at where the carbon came into the production cycle and all that was sequestered from the atmosphere in the year of production. I am simplifying it to a certain extent.

**Professor Lang:** Yes.

**Q35 Mr Williams:** Yes, there may be costs for machinery, cost of fertiliser in terms of carbon, but there is a key issue there that I think has failed to be understood in the analysis.

**Professor Lang:** I cannot comment. I am not a climate change specialist; I read the literature like everyone else does. I merely get—and all my colleagues around the world in my sort of work—consistent messages from the climate change

28 January 2009 Professor Tim Lang

specialists, whether it is the Chief Scientist at Defra or the World Bank or the FAO. They are agreed, whether you are doing short term or long term analyses you are dealing with an area of high carbon. That is leaving carbon and methane—

**Mr Williams:** I left it non-ruminant just to simplify the argument.

**Q36 Paddy Tipping:** You have reminded us on a couple of occasions of the importance of the EU and CAP and many of the policy levers are there. When it comes to food security should we not be having the discussion there rather than at Defra?

**Professor Lang:** I take that point but I do not see it as an either/or. If I need to clarify my earlier remarks I feel it is essential that the UK works out its food security within a European context. It has very good opportunities to link sustainability criteria for what that might be at the European level but I think we need to have a lead from Britain. Britain has taken a very interesting lead in global politics on climate change. I think in diet we are not taking the lead that we could and should be doing. So I do not see it as an either/or.

**Q37 Paddy Tipping:** One of the leads that the government has been taking with the EU is in broad terms moving away from payments, subsidies on—

**Professor Lang:** Decoupling.

**Q38 Paddy Tipping:** Decoupling, moving towards public good and environmental gain. How does that link into the argument about food security because a simpleton might say subsidies on production would bring forth the policies we want.

**Professor Lang:** There is probably no way we are going to turn the clock back to recoupling, but the great irony, as your question is astutely getting at, is at the moment we are decoupled production incentives to farmers is exactly when we need to get a new direction for encouraging appropriate land use and food production. What we are not doing is linking environmental gains into food production. We are seeing the decoupled CAP as paying for environmental goods instead of paying for food to deliver those environmental goods. I would like a recoupling of sustainability into food production.

**Q39 Paddy Tipping:** Is that what the phrase you used today, the common sustainable food policy—

**Professor Lang:** Is articulating that.

**Q40 Paddy Tipping:** Just describe that in a bit more detail.

**Professor Lang:** Go back into the history of the CAP. We all know 1956, 1957 the Straker Conference, the Treaty of Rome, one of the three founding motives for the European Union as it now is—the Common Market as it was—was from the ashes of the Second World War that Europe should never again experience what we would now call food insecurity—they did not use that language—but that there should be adequate and decent production to stop, among other things, the famine that occurred in 1944 in the Netherlands, let alone the dislocation

to supplies that Europe had had directly through a war. So the Common Agricultural Policy had to some extent a moral imperative. It is often portrayed in the British literature as being a hideous, protectionist, French inspired conspiracy to do the wrong things. I am not going to defend the CAP at all—I have been a critic of it for most of my life, as I think you know—but I think we should not forget that moral and political direction that it had. I am saying, my colleagues and my reports that we have submitted to you are gently, as academics, saying that we think there is a new political possibility for Europe to coalesce around a common sustainable food policy at exactly the moment where it has severed links due to political embarrassment and also financial costs of the old CAP. I welcome decoupling but actually it is throwing the baby out with the bathwater—it is forgetting the need to produce food sustainably in Europe. Not least as a climatologist said extremely emotionally in the British Association meeting in Liverpool at which I was at, at the end of the summer last year, if Europe does not recognise that it is going to be in the front line of the need to produce more food for the world it has to wake up very fast. I look at the European Union, I look at the Commission, I look at the Parliament and I do not see a recognition of the urgency for Europe to increase—increase—its production as long as that is sustainable in this broad direction of sustainability that I have been trying to articulate, namely what is good for the soil, good for water retention, embedded water and all of those issues, and mainstream public health and nutrition. I think there is a new vision now for a European food and farming.

**Q41 Paddy Tipping:** But you and your colleagues have been, as you put it, in a gentle academic dialogue—

**Professor Lang:** Sometimes it is fairly brutal, as you know.

**Q42 Paddy Tipping:** Let us get on to the brutality of reforming the CAP. What is the prospect in the near term of getting the common sustainable food policy for which you are pressing?

**Professor Lang:** Short term not much, I will be very frank; we do not see any signs of a mass outbreak of Greek farmers who are even now, as we know, blockading the food system of Greece and brought it to a standstill in nine days; I do not see them going out into the streets for a common sustainable food policy—I do not see that. I am saying that this is a long term political project, but it has to begin now for the reasons that Europe is taking a lead on the post-Kyoto, Europe has been the arena in which environmental policy has been hammered out. It has been the lead area, the lead fiscal payer on agriculture and food and we should be connecting those. It has actually had a very low role on public health but the Maastricht Treaty, the Amsterdam Treaty gave it new powers—Section 123, if I remember, under the Amsterdam Treaty gave it public health powers. It is edging into a coherent position. What I am saying very forcibly is that my



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28 January 2009 Professor Tim Lang

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colleagues and I think that Britain should take the lead; we need to get our own house into order—it is not. We have an at least three-planet food system where over consuming is an unsustainable food system. We have an inadequate diet, it is leading to obesity and all these other public health issues that do not necessarily concern you but I know do generally. Our food system is not passing the policy laugh test. So we have the task of getting our own food system into order to make it sustainable for the long term, but also I think we can apply that model and that thinking at the European level. Apart from anything else I think it gets us out of a political problem at the CAP. We are locked into a minority position. Whenever the British get up and try and argue something about the CAP we are marginal before we even open our lips. I think this view, the common sustainable food policy offers an

opportunity for allies across Europe and gets Britain out of this lingo that it has been locked into over the last 15 years.

**Q43 Chairman:** Thank you very much indeed and thank you for getting us underway. You have given us a lot of things to chew on of a verbal nature and we are grateful for that. Thank you for accepting the homework challenge of defining with greater clarity what we mean by a definition of food security. Obviously if there are further things that arise in your mind about which you would like to let us know subsequent to this or in the light of any other evidence, as always we will be delighted to hear from you.

**Professor Lang:** Thank you very much and good luck with the inquiry; it is very, very important.

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**Memorandum submitted by Professor Tim Lang (SFS 76)**

The UK government should adopt a new definition of sustainable food security, as: “the use of measures in pursuit of policies to promote a food system, locally, nationally and globally:

- where the core goal is to feed everyone sustainably, equitably and healthily;
- which meets culturally appropriate goals of suitability, availability and accessibility;
- which is diverse, ecologically-sound and resilient in the face of increasing environmental, economic or social volatility and creates robust and sufficient supply systems and stocks;
- whose principles and mode of operation can be maintained for the long term, thereby enhancing not just protecting the land’s productive capacity; and
- which builds the capacities and skills necessary for future generations.”

*March 2009*

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**Memorandum submitted by Professor John Beddington, Government’s Chief Scientific Advisor (SFS 31)**

**SUMMARY**

The challenge to ensure secure and sustainable UK food supplies to 2050 is intrinsically linked to a series of interconnected global issues, including climate change, population growth and the inexorable rise in global demand for food, energy and water. UK food security must be considered in that wider context.

Science and technology has contributed greatly in the past to enhancing food security in the face of substantial increases in demand, and there is enormous potential for it to do so in the future. The future challenge is to deliver increased production with reduced inputs such as water, energy and nutrients, on limited land, whilst ensuring environmental sustainability and coping with climate change impacts.

The UK research base can has a major role to play in meeting this challenge, with a track record of world-class outputs delivering substantial benefits both to the UK and overseas, linked to our goals for global food security and poverty reduction.

The Government Office for Science is strongly engaged on these issues, both to strengthen the evidence base and understanding of the issues and to sharpen and enhance the overall coherence of the UK response in the area of research and innovation.

**INTRODUCTION—THE GLOBAL CONTEXT**

1. The challenge to ensure secure and sustainable food supplies in the UK up to 2050 is one of a series of closely interconnected issues, impacting strongly at the global level but with implications for all countries. Most notable amongst these are climate change and the need to sustainably manage the world’s rapidly growing demand for energy and water, at the same time as global population is set to soar to around 9 billion by mid-century and to become more prosperous.

2. In an increasingly globalised world, and one in which issues such as climate change can only be tackled through international endeavour, it becomes increasingly difficult to consider only a UK perspective.

3. These issues are further connected by their impact on global poverty, most acutely in the developing world, and on achievement of the Millennium Development Goals. The FAO has estimated that 854 million people globally are undernourished, the great majority in developing countries. With the cost of food and energy soaring in 2007–08 the World Bank estimated that a further 100 million people risked falling into extreme poverty. Food and other commodity prices have more recently declined again as a result of the global economic downturn and the abatement of some short term factors. However underlying drivers such as climate change, energy and water demand, and population growth will impact increasingly on food production and food security over the long term. They present a significant problem that will become increasingly acute in the absence of an adequate response at all levels, from global to local.

4. The recent price shock revealed starkly how UK food supplies and costs to consumers are strongly impacted by developments overseas. This includes natural events such as adverse weather conditions affecting harvests in other regions (particularly if combined with similar occurrences in the UK), the policies of other nations developed in response to these, and other factors such as the growth of biofuels affecting supply and demand in international markets. After an extended period of relatively low and stable or declining prices, it provided a clear warning of the need to avoid complacency in tackling now the longer term challenges.

5. Total world water demand is projected to increase by over 30% by 2030, and energy demand by over 45%. Agriculture is by far the largest user of water, at approaching 70% to total supplies. The agricultural sector will increasingly need to compete for this with demand from the world's growing cities.

6. Economic advances projected for the developing world will help lift millions from poverty, but in other ways will add to the challenges. As incomes rise to £1–£5 per day people eat more meat and dairy products, causing a rapid growth in demand for agricultural commodities to feed livestock. Driven by population rises and growing prosperity, world food production will need to increase by some 50% by 2030 to meet this burgeoning demand.

7. The backdrop against which this must be met is one of rising global temperatures, impacting on water, food and ecosystems in all regions, and with extreme weather events becoming both more severe and more frequent. Rising sea levels and flooding will hit hardest in the mega-deltas, which are important for food production, and will impact too on water quality for many.

8. The need both to mitigate climate change and to adapt to that which it is too late already to avoid is clear. It has been suggested that global greenhouse gas emissions must be reduced by at least 50–60% by 2050 compared to current levels. The UK's target to reduce emissions by 80% on that timescale means that all sectors must make a major contribution, achieving steps changes in past performance.

9. What does this mean for the agri-food sector? The world must produce 50% more food, on less land, with less water, using less energy, fertiliser and pesticide—by 2030—at the same time as bringing down sharply the level of greenhouse gas emissions emitted globally. It is a non-trivial challenge, but it is one that can be met if the right steps are taken.

10. I believe we need a new and greener revolution, a revolution that science and technology can help deliver both for the UK and internationally.

11. Ultimately, UK food security will link closely to global food security. A “go it alone” strategy is unlikely to be either feasible or desirable, although environmental drivers argue for some further shift towards locally sourcing.

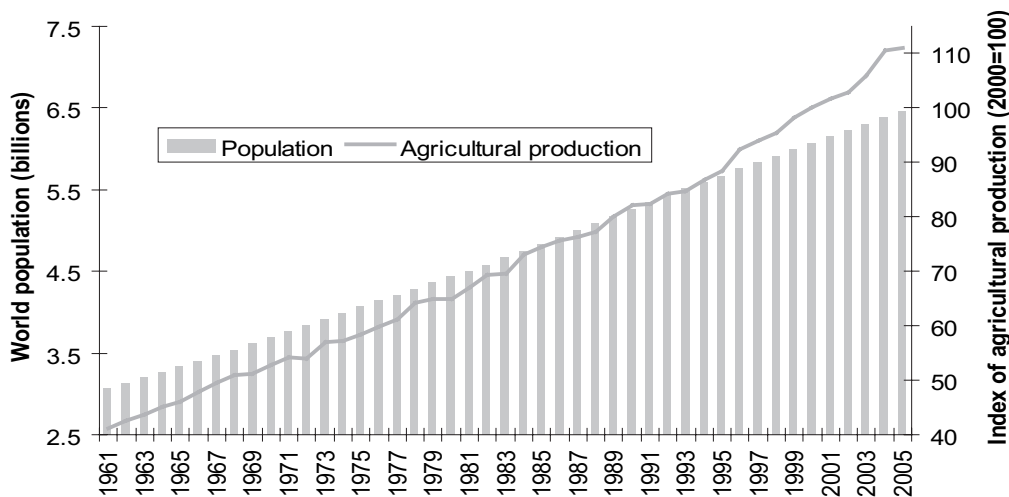
#### THE CONTRIBUTION OF SCIENCE AND TECHNOLOGY

12. Despite Malthusian fears of looming famine in the first half of the 20th century, the graph below illustrates how agricultural production was able to climb well above the rate of population growth in the last four decades. Global production has more than doubled in the past 40 years, despite only an 8% increase in the use of land for agriculture since the 1960s.<sup>1</sup> Dramatic improvements have been achieved in both developed and developing countries. Cereal production in China for example increased from 91 million tonnes in 1961 to 390 million tonnes by the end of the century, with a similarly impressive increase from 70 to 186 million tonnes in India.<sup>2</sup> More recently, Brazil has doubled grain production since 1990 with very little increase in land area, partly through large-scale mechanisation.<sup>3</sup>

<sup>1</sup> IPCC AR4 WGIII TS8.

<sup>2</sup> FAO AGROSTAT, April 2000.

<sup>3</sup> Embrapa, Brazil.



*FAO: World production and population since 1961*

13. Much of the success over this period can be attributed to technological and process innovations, such as the introduction of chemical pesticides, fertilisers, irrigation and crop improvement through breeding.

14. In contrast, the absence of such approaches in Africa has contributed, alongside other factors, to an enduring stagnation in yields.

15. Significant untapped potential remains even with current crop varieties to reap the benefits of past achievements from science and technology. The FAO has estimated that if half the extra yield considered attainable with current varieties were realised in 11 major rain-fed wheat producing countries, world wheat production could be increased by 23%.

16. The benefit of investment in agricultural research is clear, for example delivering an average internal rate of return of 43% in 700 R&D projects evaluated in developing countries.<sup>4</sup> Yet developing countries invest just a ninth of what industrialised countries put into agricultural R&D as a share of agricultural GDP. Another perspective is that agricultural R&D has tripled in China and India over the past 20 years, but increased barely 20% in sub-Saharan Africa (declining in about half of the countries there). This has contributed to the widening yield gap with the rest of the world, with further key issues relating to the adoption even of available technologies. It represents both a major challenge and an opportunity for future UK policy and research, centred on Government goals to tackle global poverty and enhance food security and to ensure UK food security in an increasingly interconnected world of global markets.

17. Despite the demonstrable benefits of research, the extended period of stable or declining global food prices in recent years has been one driver for reduced growth in the levels of investment globally in publicly-funded agricultural R&D. Private sector research has grown but its commercial orientation has placed emphasis on cost reduction rather than yield increases, and in particular there has been less incentive to address the needs of poorer farmers and to focus on more strategic, longer term issues.<sup>5</sup>

18. There is a compelling case that the declining trend in the growth of global public R&D should be reversed. Studies suggest a strong link between agricultural productivity improvements in a given year and investments in agricultural research over the previous 30 years and more.<sup>6</sup> The UK must frame its own future domestic and international contributions in this context.

*Current and future research challenges*

19. There is an enormous contribution that science and technology can make to help ensure UK and international food security over the long term.

20. For example, focusing on the UK, one study suggests a theoretical yield potential of 19.2 t/ha for UK wheat and 9.2 t/ha for oilseed rape, if future research enables physiological limits to be achieved. This compares to current average yields of 7.74 t/ha and 3.2 t/ha respectively, based on Defra figures. The realistic yields attainable will be much less, however there are still substantial gains to be made. Looking ahead to 2025 and 2050, other work suggests realistic yield potentials of 11.4 t/ha and 13.0t/ha for wheat and 4.1 t/ha and 5.7 t/ha for oilseed rape on these timescales respectively.

<sup>4</sup> World Development Report 2008, IFPRI.

<sup>5</sup> USDA May 2008.

<sup>6</sup> Alston *et al.* 2000.

21. Annual UK wheat production since the 1980s has averaged around 14m/t, peaking at 16.7 m/t in 2000. Achieving the yield potential estimated as realistic, on the same area of land, would deliver annual production of 23.9 m/t—over a 70% increase compared to the current average.

22. The wider adoption of existing knowledge, technologies and best management practices could on its own deliver significant improvements. For example, extending further the illustration above, could increase yields to 8.71 t/ha for wheat and 3.88 t/ha for oilseed rape respectively. It will be important to strengthen mechanisms for the translation and wider deployment of research outputs if this potential is to be achieved. This is where the “early wins” are likely to be. However the greatest gains, combining both productivity and environmental benefits, will come from further R&D investments. Priority areas for research include e.g. crop improvement to enhance nutrient and water capture and conversion, maximising the capture and conversion of light, and improving natural resilience to pests and diseases. More generally, climate change adaptation will remain a key research topic, including climate-water modelling.

23. Crop protection is crucial. Around 30% of crops are lost even before harvesting due to pests and diseases, with the figure far higher in some cases, and substantial further losses are experienced post-harvest. Pesticides play a vital role in safeguarding yields, a fact that I believe has been insufficiently recognised elsewhere in Europe as EU regulations covering this area have recently been updated. The withdrawal of existing pesticides products without alternatives to replace them, and without demonstrable benefits to human health or the environment, could result in a significant reduction in crop yields in the UK and across Europe, with the potential also to impact beyond Europe’s boundaries.

24. New generations of pesticides have increased in effectiveness, with application rates down to “grams per hectare” from “kg per hectare” a few decades ago. This has brought both environmental benefits and efficiency savings. Supported by UK research, other non-pesticide approaches to crop protection are also proving effective in set circumstances, and are particularly valuable in the developing world where access to and safe use of pesticides has been a problem. For example, one of the most damaging weeds in Africa is a witchweed, *Striga*, responsible for billions of dollars of damage each year. In Kenya, a “push/pull system” has been trialled successfully, supported by BBSRC funding. This involves the intercropping of a fodder crop—*Desmodium*—that prevents *Striga* from germinating, in conjunction with another technique, “trap cropping”, which attracts pests to a crop bordering the main crop.<sup>7</sup>

25. Genomics has been important in improving crop varieties for yield, sustainability and quality. Successes to date have included salt resistant durum wheat and more disease resistant oil seed cassava. Crop breeding has also focused recently on the opportunity to enhance the nutritional and health value of food itself. Following the demonstration that vitamin A can be produced in rice, breeding programmes have begun to select crops for improved levels of a range of important micronutrients.<sup>8</sup>

26. Conventional breeding has achieved dramatic increases in productivity. However, quantum leaps in future may involve fundamental new approaches to plant science. One possibility, still at an early research stage, is to re-engineer the photosynthetic pathway in rice, with consequent potential for greater production per unit input of solar energy.<sup>9</sup> Genetic modification techniques, although remaining controversial in the UK and some other countries, provide new possibilities for crop improvement and to accelerate the development of solutions. The Royal Society’s current study on biological mechanisms to enhance food crop production promises to make an importance contribution in this area, by providing a balanced assessment of the different biological approaches that could be used to enhance supplies and their likely consequences and impacts.

27. Technological innovation through the use of mineral fertilisers has been another key factor since the 1960s in enabling the increases in productivity that have been achieved. Unless nutrients removed through cultivation are replaced, from organic or inorganic sources, crop production cannot be sustained. Other benefits from fertilisers include enabling the potential of high yielding seeds to be realised where the natural nutrients in most soils are insufficient and enhancing productivity on nutrient poor soils.

28. However fertiliser use also presents environmental challenges, such as through nitrate leaching, and requires careful management. The key aim is to match nutrient supply and demand to maximise crop production whilst minimising loss to the environment. It is a key area where science can contribute. For example, research by Rothamsted has resulted in farmers applying very little nitrogen to cereals in autumn or winter, as studies showed almost all of this to have been wasted. As a consequence, it is estimated that surplus nitrogen applied to wheat crops is now less than a third of what it was 20 years ago. Leaching in nitrogen sensitive areas is estimated to have been reduced by 20%.

29. Future research priorities include to further improve understanding of when to apply fertilisers dependent on factors such as crop variety, climate and soil type.

30. At the forefront of science, nanotechnology promises new products and approaches to assist crop protection, as well as having applications in other agricultural areas. For example, smart sensors and delivery systems may help combat viruses and other crop pathogens, and new products may help plants’ ability to absorb nutrients. Already today, nanotechnology has delivered improvements to pesticide delivery

<sup>7</sup> Integrated pest management, Hassnali et al, *Phil Trans R. Soc B*, Vol 363 no. 1491 p.611-622.

<sup>8</sup> <http://www.harvestplus.org/research.html>

<sup>9</sup> <http://www.irri.org/media/press/press.asp?id=137>

through encapsulation and controlled release methods. Capsules can be inert until contact with leaves or insect digestive tracts, at which point they release the pesticide.<sup>10</sup> In combination with the use of nanoemulsions (suspension of nanoparticles), pesticides can be applied more easily and safely. Smart sensors, applied to the field, may in future allow early detection of disease and monitoring of soil conditions to improve application of water, fertilisers and pesticides.

31. The benefits of agricultural research illustrated above need to be set in the context of the broader role science and technology can play in the food supply chain, from “farm to fork”. Improvements in food quality, efficiency of processing and supply, and reduced losses of food bring major benefits, including in terms of increased choice, higher quality and lower costs for consumers.

32. Nanotechnology is already used in packaging to improve the shelf life of foods by the inclusion of silicate nanoparticles that prevent oxidation and spoilage. Increased shelf life for foods subject to rapid spoilage such as fruit and vegetables could contribute to reducing household waste, and so food demand. In the UK, roughly a third of the food bought by consumers is thrown away.<sup>11</sup>

#### UK RESEARCH BODIES AND PROGRAMMES

33. The UK is supporting major research programmes both in the UK and internationally in areas related to food security. For example:

- The Biotechnology and Biological and Sciences Research Council (BBSRC) funds fundamental, strategic and applied research that underpins agriculture and food supply. Total spend in this area was £185 million in 2007–08. This included research on the following areas: plant and crop science (including the control of pests and diseases); soil science; aquaculture; animal health; animal welfare; food safety; food manufacturing; diet and health; effects of environmental change on agricultural systems; and agricultural systems.
- Defra, via its Sustainable Farming and Food programme, currently invests around £29 million p.a. in agricultural and food research. This includes for example supporting Genetic Improvement Networks, which underpin breeding for crops combining high yields with traits for increased sustainability. Other research focuses on reducing the effects of agricultural inputs on air and water quality, and on the industry’s resilience to short term disruptions.
- DFID under its new research strategy has committed to spend £400 million on agricultural research from 2008 to 2013 to support research in six areas: to develop food that is more nutritious with higher yield crops; to create agricultural jobs for the poor from high-value crops; to protect farming communities against climate change, drought, pests and diseases; to better understand how markets can benefit poor farmers; to achieve the sustainable management of forests, fisheries and wildlife resources. This support is channelled to international research organisations (mainly Consultative Group on International Agricultural Research—CGIAR), regional research organisations in Africa and Asia, joint research programmes with BBSRC, and to public-private partnerships and programmes to get research into use. A key recent achievement was the agreement reached in December to reform and revitalize CGIAR organisation, to improve the impact and efficiency of future research.

#### *Strengths and Challenges for UK Science*

34. The UK has great strengths in science and technology related to food, extending across agriculture, fisheries, animal health, sustainability, food safety, diet and other areas. We can be proud to host many world class facilities, such as Rothamsted Research, the John Innes Centre, the Plymouth Marine Laboratory and the Institute of Food Research.

35. In bioscience, the UK ranks second overall in the world in terms of research outputs.

36. In climate science and modelling, a key area linked to our food security goals, UK capability includes the world-leading Met Office Hadley Centre, as well as the Climate Impacts Programme providing increasingly refined information and projections to support adaptation and planning at a regional and local level.

37. Building on these assets, and combined with other factors such as a moderate climate and fertile soils, the UK is well placed to ensure domestic food security over the long term and to contribute substantially to similar goals at a global level.

38. Securing this contribution from science will require a clear recognition of the importance of sustained investments in research for future benefits, as well as maintaining and developing the supporting infrastructure for this.

39. Another priority will be to tackle skills gaps identified in areas such as plant breeding and plant pathology, agronomy and soil science.

<sup>10</sup> <http://www.syngentaprofessionalproducts.com/to/prod/primo/>

<sup>11</sup> WRAP, The food we waste, [http://www.wrap.org.uk/retail/food\\_waste/research/the\\_food\\_we\\_waste.html](http://www.wrap.org.uk/retail/food_waste/research/the_food_we_waste.html)

40. As importantly, I believe there is a need to ensure timely exploitation of research outputs and to place greater emphasis on applied R&D linked to productivity as well as environmental goals. Stronger partnerships and dialogue between the public and private sectors will be required. I will be exploring these issues further with key stakeholders, as set out below.

*Government Office for Science (GO-Science) contributions on food security*

41. GO-Science is directly leading to a range of work on food security, both to strengthen the evidence base and understanding of issues from a UK and global perspective, and to sharpen the UK response where research, technology and innovation can contribute. Key current activities are set out below.

*Foresight Food and Farming Project*

42. Foresight has recently begun an exciting project looking at the global future of food and farming, guided by the question: “How can a future global population of 9 billion people all be fed healthily and sustainably?” The findings are due to be launched around October 2010.

43. The project will draw on cutting-edge science from diverse disciplines to take a long-term (25–50 years) view of the issues. It will:

- analyse the global food system: including changing demand, production and supply and broader environmental impacts;
- identify key drivers of change and investigate how they could combine to affect the food system across the world and give rise to wider impacts. This analysis will define major challenges in the future, and the uncertainties associated with them; and
- consider how new science, policies and interventions could best address those future challenges—both in the UK and internationally.

44. The project will consider food and farming in oceans and freshwater, as well as on the land.

*Foresight UK Land Use Futures Project*

45. Foresight is also undertaking a major study on future land use in the UK, exploring how this could change over the next 50 years. This includes examining society’s future needs and values towards land use. It will use the latest evidence and expert opinion across the environmental, economic and social science disciplines to identify where the greatest pressures on land could be and to identify practices which encourage valued and sustainable land use practices. The findings are due to be launched in January 2010.

46. The project has already highlighted, for example, the need to build capacity to tackle land use issues systemically and in a more integrated way, and to place greater emphasis on the management of key resources such as water. There is widespread agreement that the demands being made on land are greater than ever. It is clear that food policy will continue to influence demands on land use over the long term. Food security concerns may lead to pressure to increase agricultural production. Foresight will examine how these demands might be balanced against others such as the need for additional housing, access rights and forestry; and how the role of new technologies and management practices might influence overall patterns.

*Optimising Public Sector R&D*

47. Following up a key recommendation from the Cabinet Office *Food Matters* report, I am leading a cross-government group to strengthen the coherence and coordination of food research across the public sector. An important aim of the group is to promote a more joined-up approach on research, centred on the Government’s vision for safe, healthy and sustainable food, a thriving UK agri-food sector and UK and global food security.

48. The group will provide a forum where key cross-government food research and innovation issues and priorities can be discussed and addressed. It will also facilitate engagement on these issues with wider stakeholder groups, including research providers, funders and users. Early work by the group will focus on developing a high-level food research strategy to facilitate better cross-government working. Another current priority is to gain a better understanding of the level and scope of current research related to food across the public sector.

49. In addition, GO-Science is supporting discussions involving the Technology Strategy Board, Defra, BBSRC and others on options for a Technology Strategy Board initiative in the agri-food area, as a means for improving the development and exploitation of agricultural and food research in the UK. This recognises the critical role that the private sector has to play in the translation of research outputs into practice, both to meet the Government’s food security goals and to reap the opportunities that exist within a huge UK and global market.

*Other activities*

50. GO-Science has also commissioned two important academic studies which it is shortly to publish in advanced draft form (finalisation being subject to further independent expert review which may identify additional areas for development). These have examined respectively: (i) the world food commodity price events of 2007–8 and the factors driving these, and (ii) the potential to increase wheat and oilseed rape productivity in the UK. Analysis from these reports has helped to inform aspects of this memorandum.

January 2009

*Witness:* **Professor John Beddington**, Government's Chief Scientific Advisor, gave evidence.

**Q44 Chairman:** Ladies and gentlemen we welcome Professor John Beddington, the Government's Chief Scientific Advisor. Thank you very much for making time to come and talk to us and also for your thought provoking written evidence which is certainly very interesting. Our last witness challenged us and in fact I think challenged the government about the definition of what we mean by food security and I look back through your own written evidence, which picks up on a lot of the issues we are going to be discussing which, if you like, address the question of food security but it does not itself actually define what we mean by food security. So in writing your submission to us was there a definition that was in your mind that you were addressing when you put your thoughts on paper?

**Professor Beddington:** I missed Professor Lang's discussions with you, I am afraid. I see this as operating at a number of different dimensions. My first response to this is that I think we have at the global level a genuine issue of world food shortage, the problem of can you feed nine billion people by 2050 in some form of equitable and sustainable way? I think that is at the world level. There are obviously additional operational definitions, for example the food security within a particular state of the UK, about what are the food security issues there. I think it still is the case whether you can feed the UK population in a sustainable and equitable way. The questions then come out as whether in fact does that mean that we produce all our own food and I would argue that no, it does not, but we need to have some issues. So I think at a global level we are genuinely challenging whether enough food can be produced given the constraints of climate change, water shortage, energy demands and so on, and that is a genuine issue. Within the UK the argument has been that we are a relatively prosperous country and can go on to the world market to buy things and so therefore total self reliance on food is not an issue and there are debates to be had around that.

**Q45 Chairman:** I understand what you say and I was going to ask you about the scientific challenges of feeding nine billion people and that will come out in the course of our questions, but let me just remind you what Defra, who are in the lead on this, have actually said in terms of their definition of food security. What they say is the government's definition of UK food security is for people to have access at all times to sufficient, safe, sustainable and nutritious food at affordable prices so as to help ensure an active and healthy life. You are a scientist, you are used to dealing with precision in terms of

terminology and definitions are a very important part of the world in which you operate. Is that a precise enough definition from the point of view of arranging the science to support its achievement?

**Professor Beddington:** No, I think one would have to interpret it in some form of quantitative way. I think as an operational definition one could arguably use it as a guideline but once you actually got into detail you would have to query questions about affordability; you would have to raise questions about healthy nutrition and things of that sort. But that is the issue.

**Q46 Chairman:** You have put down a little list of things that it needs probing about and you are very heavily involved in the government's efforts now to address this issue, so are those the kinds of questions that as the Chief Scientist you are asking of others as you try to define work programmes to address the issue?

**Professor Beddington:** I can either do it now or describe a bit later the programmes we are involved in.

**Q47 Chairman:** I think we are going to come on to some of those but I mention this definition.

**Professor Beddington:** If we stay on the definition we really need to be asked operational definitions and to anticipate the sort of issues that I raised on a global basis of what do we mean by equitably, what do we mean by sustainably? These are things that do properly need to be explored and looked at. The definition that Defra has given you needs filling out and actually posing the question in an appropriate and quantitative way. I have not done that in any detail, but we are embarking on programmes to try and take that forward.

**Q48 Chairman:** Let us park that one for the moment because you opened your remarks by quite rightly reminding the Committee that the challenge is how by 2050 we were going to feed nine billion people, and that requires a doubling, according to the target set at the FAO in June last year, of the world's food production. Looking at the information that is currently available to you as a scientist, do you believe that the world has the potential to increase its production to meet that demand and thereafter sustain that production for whatever you like to define as the foreseeable future?

**Professor Beddington:** If you are asking for a view my view would be yes, but it is going to be a yes with a very large "but", because there are some very significant constraints that the science and

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28 January 2009 Professor John Beddington

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technology and indeed the policy is not developed to address. I would highlight two factors which were actually going together with that particular question. One is in fact climate change and how that is actually going to operate between now and that time period and there are major indications of serious disruption to food supplies, particularly due to changes in rainfall and to a slightly lesser extent, I would argue, changes in temperature. The second issue really related to that is that there are, I think, enormously serious problems to do with the availability of water and the changing distribution of water that is expected through climate change and also the anthropomorphic generations. There is a very, very large movement of urbanisation—2008 was the first time that the urban population exceeded the rural for the world population as a whole—and I think that that urbanisation and the requirements that urban communities have for fresh water is going to be a problem. As I am sure the Committee knows, something like 70% of available fresh water is used by the agricultural industry at the moment, so how are we going to do it? The challenge is enormous. Putting it in almost a sound bite form the challenge for agriculture is to grow more food—something of the order of 50% in the next two decades and doubling in four decades—on less land because of various factors, urbanisation, climate change and so on, with less water, and because there are other issues to do with climate change and related health issues probably using less fertiliser and less pesticides than we have historically done. So it is an enormous challenge but I think it is one that if we actually focus on the science and technology and take the food security issue as seriously and in an inter-related way with the climate change issue and not ignore one to the exclusion of the other then there is a possibility, but that is part of the foresight project that I have started; it is part of a number of studies around the world that we will be wanting to look at. My belief is that to solve the problem we have to look to science and technology.

**Q49 Chairman:** Can I therefore ask you about risk profiling because you have described a number of long term phenomena that are going to affect the ability of the world to feed itself up to 2050 and it strikes me that the more you ask the world's agricultural systems to produce more and more so the risk factors rise because if you do not have much headroom or slack in the system then if something goes wrong the events could be catastrophic. Is there an exercise that is being done amongst the scientific community to relate the passage of time to the risk profiling that affects whether you can actually achieve and sustain this long term, very large increase in the amount of food that we are going to need as a planet?

**Professor Beddington:** That would be very much a topic of discussion with the foresight team that we put together. I expect the risk profiles will be examined on these various decadal things because the risk will operate and we need to be thinking about mechanisms whereby there is adjustment to unpredictable factors. For example, if climate

change is moving rather faster than we had thought, as I think we discussed when I was last in front of this committee, we have got to think hard about how those constraints are being built up. But, quite clearly, your point, I accept, is that we have got to not just do some sort of assessment of averages and likelihoods, we have got to actually think about what those risks are. One I have characterised is the very recent food spike in the period 2007-2008. I think discussions vary on what are the most important factors, but, quite clearly, any analysis would indicate that the reduction in global reserves of some of the key grains, and so on, has got to have had an important effect, as you have no buffering of food prices. So one of the things that one would use to actually address the risk profile is to be asking questions such as: can you build up better and more adequate and more appropriately sized reserves of key commodities?

**Q50 Chairman:** One of the things that politicians do not do very well is long-term. I just wonder, given the long-term nature of the exercise that the scientific community is currently embarking on in dealing with some of the issues that you have outlined, what assurances have you had from the Government of the day that they have put in place mechanisms that will enable the work programmes that you are identifying to actually be sustained over the long-term, particularly from a financial point of view, but also to make certain that you have put in place the mechanisms that will see the job through and not be sacrificed because somebody says, "Oh, well, we have not had a problem for the last couple of years, so it is all right, is it not?"

**Professor Beddington:** I think your point is a good one. First of all, I think that the food security issue is clearly an international one. The UK, just as the UK, has an important contribution to make, as I think Tim Lang was arguing just before I arrived, but one has got to be thinking about mechanisms in the international community. For example, the Department for International Development working with the CGIAR system is an example.

**Q51 Chairman:** Can you tell us what CGIAR is?

**Professor Beddington:** I really wish you had not asked me that, Chairman. Consultative Group—

**Q52 Chairman:** You can phone a friend. What is the audience's answer?

**Professor Lang:** Consultative International Agricultural Group for Research. It is 15 research stations.

**Q53 Chairman:** I think you owe him a pint for that actually!

**Professor Beddington:** Yes, but G follows C, so I am not sure, I think it may not be accurate. Give me one second, Chairman, and I can tell you from my enormous brief.

**Q54 Lynne Jones:** Just tell us what it is rather than what it is called?



28 January 2009 Professor John Beddington

**Professor Beddington:** Okay. It is a group of internationally funded research organisations that are based in the developing world. For example, one example of it is the WorldFish vehicle, which deals with aquaculture and fisheries. There is one that deals with rice, there is one that deals with wheat, there is one that deals with animal husbandry and there is a group of these. There have been some developments, which I could mention, but there has been some concern that these have not been working together as well as one might have hoped, but there have been significant developments which DFID have been involved in with actually getting an overall council for these organisations to work together and be rather more integrated and related. I will write to you, Chairman, rather than delay the committee with what CGIAR is, rather than fluster through my brief to try and give it you exactly.

**Q55 Chairman:** That is very kind. Finally, before I hand over to Lynne Jones, one of things I know you are doing is a cross-government group to strengthen the coherence and co-ordination of food research across the public sector.

**Professor Beddington:** Yes.

**Q56 Chairman:** But I am very conscious that the provision and the supply of food in the United Kingdom is very much in the corporate private sector at the present time and that in that sector they too sponsor a great deal of scientific research. Are you in any way trying to combine the public and private research effort to ensure complementarity and to reduce overlap?

**Professor Beddington:** The answer is, yes, I am acutely conscious of it. Indeed, I was meeting with Marks and Spencer only this morning to discuss some of these issues. As you know, they have a fairly substantial food and green food agenda. What we are doing is this. I believe there is scope for what I would term a Food Research Partnership, which would be a forum where all the players, including government agencies and the private sector, would be able to explore what are the priorities that are needed for research in food and to ensure that complementarity that is obviously desirable is there. I am modelling it on work that my predecessor put together called the Energy Research Partnership. That is actually rather easier in energy, because in energy you have very major oil companies, utility companies, and so on, so there are fewer players, but the food research partnership will be more complicated to do. My aim is that we will have stakeholders from the industrial sector sometimes, for example, representatives of the retail trades, clearly the NFU, clearly representatives from major corporations like Syngenta, and so on. We are hoping to have our first meeting in March and I see this as part of the development under the Cabinet Office Taskforce, on which I am leading the work on research, to take this forward. We have had an initial meeting where this was discussed, and we have gone as far as specifying which of the stakeholder groups we are planning to invite to this meeting at the moment, but I completely accept the committee's

point. There is no point trying to do government research if you are not closely linked into the key players in industry, and I do not mean just in the productive sector; I think we have got to think about the retail and the branding sectors as well.

**Q57 Lynne Jones:** You have highlighted the importance of science for dealing with the challenges ahead in relation to food production for a growing population. Yet public research into food and farming has been declining since the mid eighties. Is that decline coming to a halt, and what are the prospects for a substantial increase in spending? I noticed in your submission you said that DFID is allocating a large budget towards agricultural research; in fact it seems to be proposing to spend far more than Defra, which I was quite surprised at. Is the situation improving? What needs to be done to improve the situation?

**Professor Beddington:** Certainly, I would agree. I will answer your question in two parts. Certainly I would endorse that there has been a significant decline, and if you take out the animal welfare and animal health agenda, that decline is even greater. I think that is unfortunate. That is mirrored throughout the world, unfortunately. World Bank spending on agricultural research, similarly, declined very substantially in this period and in the developing world. I hope, as I have been arguing with my colleagues in Defra, that this will be turned round, and I believe that there should be an increase in spending on appropriate agricultural research. I do not think the current situation is satisfactory. Of course, this is not the ideal time to be talking about major new investment because of the problems in financial services, but I believe this is sufficiently important that we should be looking to see an increase, and that is certainly the case that I will be taking up with my colleague Bob Watson in Defra and will be taking up with Defra ministers.

**Q58 Chairman:** Yesterday I sat and listened to a statement where the Government said that motor cars with greener futures seem to be worth investing some billions of pounds in. Are you not saying that the same priorities attach to investment in all of the huge challenges that you enumerated in your opening remarks, which is going to affect the production of food? That seems to be a very good thing to be spending money on at this time, does it not?

**Professor Beddington:** Yes. I think there are some complications about that analogy, but in terms of the amount of spending that one would put on food, I think it should be significantly increased. I think the point about electric cars is that there is a major potential for exports first, the technology develops, you actually have climate change benefits, and so on, which is slightly beyond what the food is.

**Q59 Lynne Jones:** Surely that applies to the food sector. When we are talking about a current budget of 29 million, even to double it is peanuts in relation to what we are talking about in other sectors.

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28 January 2009 Professor John Beddington

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**Professor Beddington:** I would not disagree with that, and if we thought about the science budget as a whole, arguments could be made along those lines given the amount of money that has gone into the financial sector. Taking the food, I think 29 million is not—

**Q60 Lynne Jones:** The science budget has grown, but within that growth—

**Professor Beddington:** There has been a decline in the Defra budget for food. That is unfortunate and I think it should be reversed.

**Q61 Lynne Jones:** That leads me on to the issue of the skills base, which you again highlighted in your submission and also in other submissions. What are we going to do about this? It does seem to me to be serious when you are talking about areas like plant breeding, which is going to be crucial, if we are going to be able to feed the world. Are you making any recommendations as to what we are going to do to build up that skills base and what sort of timescale are we going to need for that?

**Professor Beddington:** In terms of the skills base, obviously there are some time delays, but I believe the focus on research, which the BBSRC are leading (and the BBSRC has indicated that it intends to spend significantly more on agricultural research than has hitherto been the case) will have a natural feedback, in the sense that with that extra research budget universities will look to their postgraduate population to do it, but I think there are some difficult issues there which need highlighting. I highlighted in my comment that we are losing some rather key skills. One of the biggest problems that we have at the moment in world food terms is the control of pests and disease. Many of the pests are insect pests, and yet our training and postgraduate training in the taxonomy of insects and arthropods in general is actually, I would not say dangerously low, but certainly a matter of concern. I think we need to look right across the board and say, “Where is the training going? Where are our colleges where people can actually do research that is sufficiently applied, that is going to be relevant to agriculture?” I think that this is the thing that I will be taking up with my colleagues in DIUS, because DIUS has the responsibility for the development of the skills-base at universities and, indeed, also by dealing with the funding of the research councils. So my colleague Adrian Smith, who is the Director General of the research councils, and I will be exploring ways to do it. What I would say at the moment is that there has been a run-down. I highlighted the decline in some of the major institutions. I am glad to say, some of the BBSRC institutions are still some of the best in the world, but are they getting the right recruits in? We have an enormous challenge, I believe, an intellectual advantage, for example, in plant genomics, which we should not see eroded, but getting people in to do degrees in agricultural science, I am not entirely certain that is the right way to do it because I think many of the problems that we have are generated in biology and chemistry, and some of them in physics and engineering, and what

we have got to try to do is ensure that there is a research base and an appropriate career structure for people to take this forward. One of the things that I was extremely saddened about when I was at Imperial College was that Imperial merged with Wye College—which seemed to me to be an enormous opportunity—the longest standing agricultural college in Britain, and, unfortunately, for whatever reasons, and I was not party to it, that merger did not really work and Wye College, effectively, in terms of its production of agricultural students and agricultural researchers ceased to exist. That is to be seriously regretted, but we have got to look at where we still have centres of excellence and where we can build on them, and I would cite BBSRC institutes and I would also indicate that some of the key departments, Reading being an obvious one, are areas where we have the chance to build on that. I think the funding level going into research is going to be increased, but we have also got to be thinking rather creatively about the job market, the way in which it works both in government and in the private sector.

**Q62 Lynne Jones:** I take your point about undergraduate training, but the old MAFF used to have a studentship scheme for postgraduate students. Is there a case for reinventing such a thing? We are not just talking about “blue skies” research, we obviously need to have the next stage of research, which is where we have probably lost out in the decline we have just been talking about. I am not sure you have answered my question about building up the skills base on the development side as opposed to the “blue skies” research area.

**Professor Beddington:** I think your point is a good one. The BBSRC is essentially funding work in the area of path breaking science. It is the remit of the research councils to do that. How do we actually build up the applied skills? I think there are different questions. The Food Research Partnership we are talking about I would seek to explore; I would also seek to explore it with DIUS, because we are in a situation where those individuals who are coming through have the applied skills, they know how to work with the farming industry, they know how to work with the retail industry. The recruitment of that is, I believe, uncertain and we need to be addressing it and I plan to do so. If you would like me back in a year’s time, I would hope to come with some good news and some initiatives, but I do not have anything that I can show you at present.

**Q63 Lynne Jones:** You spoke earlier about what you are doing to engage stakeholders. Obviously some of those larger stakeholders, and some smaller organisations like breeders, are engaged in research, and it is very important that we have good co-operation at the research level. What are you doing to encourage that, or what do you envisage will need to be done if your aims are going to be achieved?

**Professor Beddington:** It is a good point. The analogy I made with the Energy Research Partnership is one where you have very large organisations. For example, the Energy Technology

28 January 2009 Professor John Beddington

Institute that followed from the Energy Research Partnership and Rolls Royce, Shell, Caterpillar, BP, E.ON, and so on, enormous major corporations. The food industry is not like that; it is much more complicated and has many small and medium sized enterprises, not least in the actual productive base, within the farming community. We have got to work out ways of doing that, but what we have got to make certain is that we hear those voices and try to ensure that research, when it is government funded, meets some of the requirements of these enterprises and that we work together, and that is the aim of this work.

**Q64 Lynne Jones:** Some of the hurdles for those small companies accessing government funds, it has been suggested, are too high for them to really engage. Would that be something that you would be looking at?

**Professor Beddington:** I think certainly, if that is, indeed, the case.

**Q65 Lynne Jones:** It was evidence we have had from John Innes talking about link funding and case studentships.

**Professor Beddington:** Yes. Everything I have read about the link, and I have been in the job a year, but the link programme seemed to have met a real need, and in the way in which we take that forward I think we have got to try to make certain that the work that government funds meets demands from all sectors. Government should not be putting money in to solely benefit a large corporation which can actually match those funds. Getting a model where, in fact, you get a buy-in from smaller enterprises has got to be an aspiration for us. I will be working within the Food Research Partnership in hand with Defra and the Food Standards Agency and others to try to ensure that that happens. You posed the problem. I agree with the problem. I do not have an answer yet, but be assured, I recognise this is a problem and we are trying to address it.

**Q66 Mr Drew:** Is not part of the problem with research in this area that there is a decline anyway in the relevance of agricultural colleges? All the ones that I know have diversified into all sorts of other areas outside agriculture. If you are trying to make the case for greater investment in science, the supply chain of people is itself getting somewhat smaller. Is this not something we ought to be looking at if we are to reinvigorate our farming industry in this country? We should do something to stop that decline.

**Professor Beddington:** Yes. I think one could spend some time examining the history and the way in which agricultural colleges and departments have actually diversified to meet quite reasonable new agendas. I think the importance of the environment, the importance of climate change, the social issues associated with the rural economy: all of these are proper but we need to be thinking about the applied science which actually can be of value to food

production at the farming level and also the food producers. I think it is a reasonable problem to pose and I think we need to explore how we deal with that.

**Q67 Mr Williams:** A lot of the work that used to be done by government funded organisations, such as the Plant Breeding Institute in Aberystwyth and the Plant Breeding Station in Cambridge, has now been taken over by commercial organisations?

**Professor Beddington:** Yes.

**Q68 Mr Williams:** But more and more of those are not even based in Britain at all. The question is, particularly in plant breeding, will they be committed enough to breeding varieties that are suited for the conditions that we have in Britain, or will we have to make do with second-rate varieties that are bred for other countries?

**Professor Beddington:** It is a problem. I am actually going to visit Syngenta's research lab in Manchester tomorrow—I am going up to Manchester after this meeting—and I think engaging on that here is important. We do have world-class facilities. Rothamsted and the John Innes Institute and some of the work that is done in Cambridge are world-leading. There is no doubt about that, so we have a chance to look at it and, in terms of marshalling that scientific excellence that we have in the country, I think there should be a good chance of ensuring this engages with industry in an appropriate way, but the history has not been good.

**Q69 Mr Williams:** Particularly with the refusal to engage with the technology surrounding GM organisms, it has been a disincentive for these international companies to commit themselves completely to the British and even in the European context?

**Professor Beddington:** I have spoken on this at various meetings, and I think I have spoken on this at a meeting prior to even taking up the job. The first thing to say is that it is plant genomics that is absolutely the key. Whether plant genomics guides you for marker breeding, which is extremely successful and useful technology, or some of the problems that we are facing in the context of world security, I think that in the present state of science we think by far and away the only best way forward is to try and solve these problems using genetically modified organisms. There are a few of them that look to be extremely difficult unless you use GM style techniques. For example, salinity resistance in some of the cereals, the problems of drought resistance, and there is resistance to certain pests and diseases, but I do not think GM is either good or bad. GM can or cannot solve the problem. If it can solve the problem, we need to be thinking about it. We obviously have had a history of debate on GM, and I think they seem to be reversing now, but my view about it is that if there is a problem that can be solved by using GM technology and it can only be solved by GM technology, the first thing you should do is develop and let us look at that, and the second thing, you have to look at whether there are either health or environmental disbenefits, because that is

28 January 2009 Professor John Beddington

the appropriate thing to do. So we need to ensure that we have a safeguard mechanism. That being said, I do not think that the current operation of the regulations of GM crops in Europe is working at all well. In fact, it is taking a very, very long time to get any form of agreement. I am sure this committee is better aware of the detail of that than I, but I think it has had a consequence. In fact, small and medium sized enterprises are probably not going to be able to do that because the regulatory burden is so substantial and the time delays before getting agreement are substantial, and that is a real issue. I think that we need to be engaging to see if we can actually turn round the European regulatory system to improve that. In terms of the other things, one of the things I would highlight for you, which others may have done so forgive me if I am telling you things you know already, is that the Royal Society study on the contribution of biotechnology to the food security problem is expected to be reporting in the spring or early summer,<sup>12</sup> and I think that will address some of the issues which that expert group believe will be addressed by GM crops. I would be very surprised that there are techniques which do not involve them, but we have got to recognise that there is a consumer attitude, particularly in Europe and to an extent in the UK, which is very resistant to their use. Whether that resistance is scientifically underpinned or whether in fact it is not, we have still got to recognise it is there, and we need to be thinking about the ways in which we take it forward. For example, GM cotton is ubiquitous, and suppliers of cotton goods are using GM cotton the whole time. They are not doing that in the context of food. I understand there is a behavioural response: something that is going to go on your shoulders is less concerning than something you put in your mouth, but these are issues. My hope is that we have a sensible scientific debate, but I believe what we have to try to ensure is that proper fears are addressed, that we have proper assessments of environmental impact, but that when GM technology is brought in it is actually genuinely solving the problem, and Europe and the UK are way behind. GM technology is developing throughout the rest of the world.

**Q70 Lynne Jones:** On that point, we have actually lost a lot of research jobs from multi-national companies actually moving their researchers back to the United States or elsewhere, and it is only Syngenta now that is here at all. Perhaps one of the reasons there has been such reluctance on the part of the people of this country and Europe to take on board the benefits of GM technology is that the research and development has been carried out by these big multi-national companies? In other countries, for instance, in Cuba, there is a lot of state research in this area. Is there not an argument that there should be more public research in this area if we are going to get wider acceptability of GM technology?

**Professor Beddington:** It is an interesting suggestion, and I think your analysis of the historical situation may well be correct. I think that I would like to see such development both aimed at the fundamental science to understand the plant genoms of the key crops but also to look at the way in which that funding is done. BBSRC is funding work in this area; I believe the Department for International Development by the CGIAR system—which I can now tell you is the Consultative Group for International Agricultural Research—is also doing that. Indeed, on the point you make about Cuba, there was some very interesting work that was done in Africa on cassava, which came directly from the CGIAR and is genetically modified and has actually solved some problems. I believe in the international community this is working well, but it is worth examining.<sup>13</sup>

**Q71 Mr Drew:** On the question of GM, I hear what Lynne says and I have some sympathy with public research, but is not part of the problem here that maybe people may be irrational but in the main they have got a very clear view on GM, not just in this country but in the rest of Europe and, indeed, in other parts of the world, and that is partly connected to the structure—how GM has come into the food chain—but this puts science in quite a difficult light, because science may be saying we will do this totally objectively, but consumers do not see it that way; they see it as an imposition, that you are coming in the back door through animal feed. There has been no scientific evidence of what may have been introduced into the food chain, but this area of food it is not an easy place for science to be.

**Professor Beddington:** Your point is a good one. What I would say here is that when the GM debate first started several years ago, first of all, the developments were actually focusing on essentially cost-cutting issues like that, they were not solving difficult problems that you could only solve in that way. For instance salinity, drought and so on. So that was it. There was, I think, as Ms Jones has indicated, some distrust of the large corporations that were involved in it and there was a debate, but I think that what science has got to do is to indicate whether there are uncertainties or where the balance of the evidence lies. I think that when it first came in there was a reasonable concern: are there genuine health effects? That seems to me to be a perfectly reasonable question to pose to the scientific community. The answer is that the data had not had a chance to accumulate, you had not had long-term studies that were able to do it, but I would point to something which I have actually said earlier on to another select committee. There has been, as far as I am aware, no litigation in the USA, or elsewhere, on the basis of health damage to humans from taking GM crops. It does not mean to say they do not exist, it does not mean they should not be examined properly, but GM has been eaten widely throughout the world and we have not had indications of major problems. That is

<sup>12</sup> *Witness amendment:* The Royal Society report referred to is in fact expected to be published in September 2009.

<sup>13</sup> *Witness amendment:* CGIAR research briefly referred to on cassava uses the genomic technique of marker assisted breeding rather than genetic modification.

28 January 2009 Professor John Beddington

not definitive, but I believe it is indicative that in fact this is a thing that could be up for re-examination, and I would welcome the debate. I think the Royal Society will be posing some of the issues that biotechnology can do to health; we will examine that. The food and farming study, which is looking at 2050, is going to be looking at a whole variety of techniques. I would say GM is not the only answer. Proponents of GM who claim it is the only answer, I believe, are incorrect, but it may well be part of an answer to a number of very difficult problems that cannot be solved by genomic related marker breeding or, indeed, conventional breeding. I am sorry, that was a bit long-winded, Mr Drew.

**Q72 David Lepper:** Could you comment on the willingness or otherwise of farmers to participate in field trials of GM crops? Do you have any information about whether that willingness is declining, or increasing, or is static?

**Professor Beddington:** I am sorry, Mr Lepper, I do not have any information on that. Obviously, we could turn to colleagues at Defra, who would probably have it. Such conversations as I have had on it are primarily focused on what seems to me to be slightly anomalous, as the publication of the location of the trials followed by their destruction, all be it illegally, so I think there are clear issues there, but in terms of the farming community as such, I just do not know, I am afraid.

**Q73 Dr Strang:** Do you think the public sector in the area we are talking about has got the balance right between “blue skies” research and practical research? You seemed to be hinting earlier, picking up from Lynne, that in fact there has been a very severe decline in investment in the more practical applied area? One of its strengths, I thought, was you had the more fundamental people in the same research station as the more practical people. Just on the general point, do you think that we have got the balance wrong and there is too much underplaying of the actual practical farming side?

**Professor Beddington:** Yes, I do. I think that what BBSRC are doing by encouraging this scientific research is absolutely excellent, but I believe we have got to think hard about how the research that is actually being done can be utilised to solve the practical problems that we have in the food industry at present. I think that the balance is wrong and how we redress that we need to explore, but I think the sort of initiatives that I have indicated and the way in which the Government has set up under the Cabinet Office this food taskforce I hope will be examining those. I am chairing the group on research, and I think that is the sort of question that we should be addressing. My instinct is that the balance is wrong, but it needs clearly to be examined and debated.

**Q74 Chairman:** You will not be surprised to learn that not everybody would agree with some of the things you have said. The committee have been furnished with a copy of a Soil Association publication entitled *An Inconvenient Truth about Food—Neither Secure Nor Resilient*, and it puts

forward a challenging analysis which says, because of import dependency for things like pesticides, primary energy, et cetera, we have got to address that agenda if we are to secure a viable food supply from using our own resources. They talk, for example, about working through the Food for Life Partnerships: “The Soil Association is recreating the diverse regional food economies capable of responding to any future food emergency”, and it talks about local sourcing. It is an alternative point of view. In terms of the science effort, is that a point of view that you respect and is it the kind of approach that ought to have some scientific input to underpin a different approach than the one that perhaps you have advocated where people who were involved in what I might call mainstream agriculture, as currently practised, might well recognise what you have said as supportive but here are a group of people who have a different analysis? Do you feel that we should be supporting their view with an appropriate line of scientific thinking?

**Professor Beddington:** I should say, I have not read the document, Chairman, so it is slightly difficult to comment in any detail, but think that locally sourced food has clear advantages to do with the environmental impact, the green house gas emissions, the fact that it also has benefits to bring to rural economies; so there are clearly good things to do there. In terms of the research questions that it poses, I think they are primarily social science questions rather than scientific ones.

**Q75 Chairman:** Let me bring it down to a very simple level. One of the things that came out of the workshops at the FAO conference in Rome was a very interesting debate as to whether you go down the use of the types of technology which are science-based that you have talked about or should you at the most basic level use the type of basic agricultural organic techniques with which many small-scale, for example, sub-Saharan African farmers are actually used? The question from the Western scientific position is: should we use our knowledge to support the maximisation of the potential of a type of simpler agricultural regime that many millions of people are familiar with because if they can produce more, in global terms, that takes pressure off the lines of supply which might be of importance to us?

**Professor Beddington:** I think the simple answer to that is clearly we should. It is a question of one answer does not suit all. If you look at parts of Sub-Saharan Africa, there is real potential for relatively modest interventions in term of seed, in terms of irrigation, in terms of infrastructure, in terms particularly of crop storage, which actually has the potential to make the productivity of small-scale agriculture and small-scale agricultural communities enormously more productive, and clearly that is one of the things that we should be looking at. The Department for International Development are actually engaging a whole number of projects which are looking at improving small-scale agricultural productivity and addressing some of these issues. As I say, water and storage are two of the very key ones, but also there is infrastructure, the

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28 January 2009 Professor John Beddington

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development of markets—lots of things like that. In DFID, you might think about talking to the Chief Scientific Adviser, Sir Gordon Conway, and asking him about the work that DFID is doing in agricultural research. He would be able to answer in much more detail, which might be helpful to you in terms of the general situation. One of the debates is really on farm size. Are we looking for enormous agricultural entities in areas? The answer is, yes, in some areas where there is not a large indigenous population and where you can have the potential for producing a large amount, but also in the areas where there are large centres of population and rural communities you want to try to improve their productivity too. At the very start of this discussion you were saying how this is a very difficult problem; are we going to be able to do that? The answer is I think we can, and it is not just by doing pure science and technology, but it is actually addressing these issues; and sometimes there will be very simple fixes, but I think they should be done and they have got to be done at lots of different levels.

**Q76 Chairman:** You mention the word DFID. I notice that in paragraph 16 of the evidence you sent us you said, “The benefit of investment in agricultural research is clear, for example delivering an average internal rate of 43% in 700 R&D projects evaluated in developing countries.” Yet you did not provide a parallel figure for the return on agricultural investment spend from the United Kingdom. Does such a number exist?

**Professor Beddington:** Not that I am aware of. If I had got it I would have actually included it. There was a detailed study that was done in international development looking at that internal rate of return. I will inquire further, but when I was preparing the written evidence, Chairman, we could not find it easily.

**Q77 Chairman:** The reason why I mention that is that you were making a case earlier that we should be looking again at the quantum of spend in this area, and I would have thought it would have been very valuable: even if the rate of return was half that, people would be falling over themselves to get a rate of return like that on investment under the current situation.

**Professor Beddington:** Your point is well taken. I would say that this is being looked at in terms of the importance of scientific investment as a whole. This is an active project that is working within DIUS, and my colleague, Adrian Smith, is developing this to actually ask generally about R&D and what methodologies you can use to evaluate how good the investment is. That is work in progress. I think it is a perfectly reasonable question to pose in terms of the subset of that in terms of the agricultural sector. As far as I am aware, it has not been done, but the point you make is correct. If we are going to do this and argue the case for more investment in agricultural science and in research, where are the benefits and are they quantifiable? This is a question I will take up with colleagues in Defra.

**Chairman:** Thank you.

**Q78 Paddy Tipping:** You talked to us a lot about GM and particular consumer resistance, but there is consumer resistance to all technology in food production. People are anxious about food scares. They do not believe ministers when they give reassurance. What is your role and the role of the Chief Scientist and your colleagues to try and have a rational debate about this with organisations like the Daily Mail, for example?

**Professor Beddington:** What I would argue is the key is evidence, the appropriate thing is evidence, and we should be asking about what the evidence looks like. I am charged with the role of trying to ensure the evidence is the best there is. If there are uncertainties, they should be characterised as such, and I think that historically there have been uncertainties. I do not think one could reasonably try to allay fears unless you indicate that appropriate work has been done and that the evidence base indicates that those fears are groundless, but you need to do the work, you need to make the assessments before you do that. I see my job as essentially saying: the scientific evidence is this but there is this degree of uncertainty with it, and I would characterise it in that way, I should not try to pretend that I should characterise it where we do not know, and that, I think, is where my job finishes and the job of others takes over. My responsibility is to make certain, if there is scientific or engineering information which we need to do which we have, that we can collect it, and, where there are uncertainties, I should characterise those.

**Q79 Paddy Tipping:** That is a very balanced approach. You would never see yourself as an advocate in the face of a lot of ignorance?

**Professor Beddington:** I think the role has many styles, shall I say. I think that if you go too far you have the potential to undermine the position that you wish to be making certain that the science and the uncertainties around the science is characterised, and I believe that is the appropriate way to do this in my role. I think where I can move down the advocacy scale is where scientific evidence, or what is claimed to be scientific evidence, is produced in favour of a particular policy which I believe to be completely incorrect.

**Q80 Miss McIntosh:** Could I turn to the Pesticides Directive. I was over in the European Parliament the week before and it was fairly obvious that, whereas Britain was minded to try and amend the original directive, we were not getting much support from other Member States. I notice that you say in your submission that you believe that if, indeed, the Council of Ministers does formally adopt the Directive there will be a significant reduction in crop yields across Europe. Why do you think it is the case that other European countries did not support Britain in limiting the remit of the Directive?

**Professor Beddington:** I have asked the same question. One of the things that I believe is really rather difficult in the European Community is the way in which the scientific community operates within different Member States and with the Commission. When the pesticide regulation came in

28 January 2009 Professor John Beddington

and was starting to be discussed, Defra were obviously engaged, but there was no equivalent that I could talk to in member countries to actually say, "This looks very strange." One of the things that I did, there is a group of a mixture of science ministers and chief scientific officers like myself, it is called the Carnegie Group, it is the G8 plus five, and I presented a paper to that Carnegie Group meeting in December in which I made the case that I believed that the use of a hazard based assessment of chemicals or, indeed, any other activity was unscientific and inadequate except in cases of very dire ignorance, where precautionary principles should come in, and we debated it at that time. My impression is that, if one could have that debate at an appropriate level, there would be agreement, but I do not understand why this particular Pesticide Directive has come through. In terms of the potential loss to crops, it will depend, I believe—and this is my understanding from talking to Defra colleagues—on how it is implemented, but *prima facie* just taking something and banning its use or seeking to reduce its use just on the basis that it is a hazard rather than doing a proper risk assessment seems to me to abrogate the scientific responsibility and certainly is not an evidence based policy, but I think the UK position is perfectly reasonable, is a properly science based and evidence based policy. I have no explanation. I have not worked at any length of time in Europe to understand why this has happened, but I do see a real potential problem here. The sort of question I ask myself is: why has this not applied to the energy sector? If one is moving towards a hazard based assessment in agricultural chemicals, why are we not saying actually nuclear is quite a hazard, and so on. It is almost a *reductio ad absurdum* argument, if you actually start focusing on the use of hazard rather than risk, and I will continue to make that case in Europe.

**Q81 Miss McIntosh:** My understanding was, obviously when it was a small organisation that within the Commission, there were a number of national experts seconded by each national department that used to advise the Commission at the earliest possible stage that the directives were drafted, and if they have gone away from that system that is highly regrettable. In your view, is there anything the UK can do to mitigate the impact of the Directive if it is adopted in its present form?

**Professor Beddington:** The biggest one is to do with fungicides. I think that it is the sort of thing that we need to look at. It is going to be coming in, in two or three years. There is a hope that people will argue that the pesticide and the chemical industry may actually come up with alternative fungicides which do not have the capability of some sort of very large concentration of endocrine disrupters, but I do not know. I think this is work in progress. In a naive way I did not believe this would happen. I am a year into the job now and realise such things do happen, and we need to think about how we mitigate it because the UK, particularly in wheat, we have a maritime climate, we have a much bigger problem than some of our colleagues elsewhere in Europe and we need

to think about that. Whether this results in new strains or a change in land use, I am not sure, but it has got to be addressed, because if this is implemented in a severe way we are going to have really big problems.

**Q82 Miss McIntosh:** Is this the first time that a directive was decided on a hazard based—

**Professor Beddington:** As far as I am aware, yes, certainly if that is a true statement, and as far as I am aware it is. If I am incorrect I will find out and I will write to you.

**Q83 Chairman:** Can we move from the land to the seas. The UN FAO calculate that between 15 and 20% of all animal proteins come from aquatic animals, but we know, whichever fishery in the world you take, that the stocks of fish and marine life is under enormous pressure because of tremendous over fishing. Again, in your paper the only reference I could find to the marine dimension of science was in paragraph 34, where you list the Plymouth Marine Laboratory as one of the places where you say the UK has great strengths in science and technology, and then I read on to look at the terms of the Foresight Food and Farming Report and I could not see very much reference to marine activity, and then I got to the end of the paper. So why is there no activity in marine to parallel land when, clearly, it is a very important source of protein but one which, in sustainability terms, is under enormous pressure?

**Professor Beddington:** First I can give you some reassurance, because in discussions with the stakeholders and the expert group we have decided to include both capture fisheries and aquaculture, both fresh water and marine, in the study of the Foresight Group, and we are at the moment putting together a group of experts, one of whom, Professor Serge Garcia, used to run the FAO fisheries department and was the officer in charge of essentially doing these large assessments. Why are fisheries such a mess is a complicated issue. Because I used to work in fisheries I was reticent to follow my hobby horse, but I wrote a paper in 2007 for science together with two colleagues, Professor Colin Clark from UBC and a colleague David Agnew from Imperial, and the argument there is really two or threefold. The first problem is that we do understand the science. The science is that, very straightforwardly, we know what sustainable yields are, we know how to deal with uncertainty, we know how to deal with estimations of uncertainty in marine fish stocks. So why does it not work? The first question is that the regulations are poorly enforceable. Regulations that are enforceable need to be used, and there is a big difference behind having a regulation, that is to say regulated on the basis of tonnage of catch, which is very hard to regulate because you have to monitor it, you have to go to ports, you have to board vessels to see what is happening. An alternative regulation which says the number of days at sea, or control of effort, is much more easily enforced. That is one thing. The second, which I think is equally important, is that in terms of

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28 January 2009 Professor John Beddington

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marine fisheries the ones that are successful—in the paper that I wrote we did look at successful fisheries and there has been a subsequent study on that basis—tend to be ones where the ownership question has moved from hunting to husbandry. You provide ownership of the resources and, therefore, it is in the interests of those who have the ownership of resources and are exploiting them to actually do that; so you do not have a top-down control that you will need input from government to make these things work. These fisheries where there has been an ownership allocation of property rights to the fisheries are the ones that have been most successful and are the least depleted in the world. Our study in science showed that, and there has been a subsequent study from colleagues which I can share with you. If you would like, we can pass those studies to the committee. So I think there is a mixture of those problems to do with regulation, but I think that the ownership is one way of actually getting round that because monitoring and control, when in fact it is the interests of the fishing industry to avoid that monitoring, to avoid that control, is very difficult indeed, extremely expensive and does not work. We have just published another paper with colleagues on the extent internationally of illegal, unregulated fishing, and it is very serious. It is very serious in countries where they have very poor ability to monitor and control.

**Q84 Chairman:** As a former fisheries minister who still bears the scars of dealing with the industry, there is much which I could debate, but I will not, I will restrain myself from running old stories, but one of the things that does concern me from the UK scientific point of view: a lot of the science is not taken note of by politicians, who ultimately will make the decisions, and perhaps it is an interesting question, where you point out that science has at least an understanding of the challenge, that science is not always adhered to when it comes to determining the end game of what under those regimes, like the Common Fisheries Policy, determine how much fishermen should take from the seas. What work is being done to analyse the potential of the marine environment to feed vast parts of the world which put a greater dependence than we do in these islands onto the product of aquaculture? Again, one of the themes that seems to come out is that if you have less pressure on food supply chains in the developing world, clearly that makes it a bit easier for us to sustain ourselves and, to go back to a point you were making in your evidence at the beginning, if we have to dip into markets outwith of our own production, there may be things for us to buy if they are not being demanded, because in the developing world there has been too much pressure for protein on the marine environment and, therefore, we head to the land environment. One might argue that what has been happening in China, with a desire for land based protein sources, has contributed to the increase in demand for the kinds of food stuffs upon which we are dependent and, therefore, what we can contribute scientifically to safeguarding the

potential of the marine environment is very important. Is there work going on to address that issue and do you believe as a scientist that particularly in those areas where there is very heavy dependency on the marine environment for food stuffs it has the potential to develop its supply to meet the burgeoning populations in particular of places like South East Asia?

**Professor Beddington:** I think the first thing to say, if we are focusing on South East Asia and China as well, is that there are very substantial fresh water and brackish water aquaculture industries which work very well, and also in South Asia in particular there is what you might call fish ranching; so it is a mixture. It is not pure aquaculture but it is not pure capture fisheries and it is a mix. These are relatively small contributions but in some water bodies it can be extremely valuable socially. There are some difficulties with very intensive aquaculture in the developing world. This is not an area that I know particularly well, but I think one of the key issues is to do with ownership: because if you are actually developing aquaculture systems in rural communities, how that is actually allocated is a real and difficult issue. Co-management of small communities is one of the ways that it is actually dealt with. Quite a while ago I ran a programme on fisheries for DFID on fisheries management science and we had a number of programmes which dealt with the social issues and how, in fact, that could work in a whole variety of areas, and there are some social systems for managing inshore fisheries that address that. Whether, in fact, it is possible to actually really generate it I am not certain, because I think it is to do with the level of productivity as you move further off-shore. If you take some of the major up and running systems, most of the productivity is some way off shore and needs semi-industrial capacity to deal with it. I think that there is the potential for aquaculture to deal with it, but you also have the real problems that we see in more developed aquaculture—issues of disease, issues of genetic composition of the species, issues to do with pollution. Shrimp aquaculture is the one that took off throughout the developing world with major problems of environmental degradation and major problems of economic sustainability. So a lot of money was lost and a lot of communities boomed and busted, basically, and left significant problems of environmental damage. It is not, I believe, a universal panacea, but it is really important. We have excellent institutions. Probably the top aquaculture institute in the UK is at the University of Stirling, an excellent institute of aquaculture there, world renowned and they do very important work. I mentioned the CGIAR and WorldFish as a very substantial aquaculture programme, and as far as I am aware, DFID put some money into it, but the extent, I am afraid, I do not know.

**Q85 Chairman:** Will your expanded foresight work also underpin the scientific input that will be needed as the European Union prepares the start of the process to reform the CFP in 2013?



28 January 2009 Professor John Beddington

**Professor Beddington:** I do not think so. The reasonable question that you will then ask me is: why not? I think we need to look at oceans; we need to look at aquaculture. Focusing as a particular case study on the CFP may be a reasonable thing to do, but that will be down to the stakeholder and the lead expert group. The first meeting of the group of lead experts in this area will scope out what work is actually going to be done on fisheries and aquaculture and oceans generally, and it will also look at fresh water bodies, I hope. It is a question of should we be doing that as a case study. The European Union is very important in this area, but in terms of global scale it is relatively modest—about 100 million tonnes come in.

**Q86 Mr Drew:** In terms of the fishing issue, is there such a thing as a sustainable fishing policy or is it literally you put your rod out and you hope you do not take too many fish and there is not much you can do about it? Again, science gets used and abused in this area very regularly. It is not unknown for the fishermen to launch a raid against scientists to say they do not know what they are talking about; there are so many fish around these islands you would have to be blind not to recognise that, and all the evidence is contrary to that. Is this something we could achieve?

**Professor Beddington:** I think there has been a problem of credibility of the scientific assessments with the fishing community. We need to think about ways to take it forward. ICES<sup>14</sup> have working groups which provide advice to the European Community and that advice is done in a rather neutral way. It says, “Our estimate is if you take this much, the stock will continue to decline. If you take less than that, there may be some modest recovery. If you take this much, there will be a very fast decline.” To an extent, that advisory work is taken. They have chosen to present it in that rather neutral way, which leaves it to essentially a political discussion on how much of that advice—. I am sorry, Chairman, I am thinking that I am telling you things that you know extremely well, but that is the way they choose to do it. I think there has been a credibility problem. I think, particularly at some stages in history, the credibility problem is based on the data that was provided to the scientists, particularly in terms of catches because, as I indicated, some of the catch data are quite problematic. If you have poor information coming into the science, the science will not be as accurate. I think that some of the things that have been done in the USA, for example, involve fishing communities in doing scientific measurements, and some of the plants to perhaps do that in the UK have the hope for doing it because it is in everybody’s interest to get this right. Scientists do not want to be operating on duff information, giving assessments which are formally incorrect because the information is poor. Fishermen, hopefully, would be expecting to have good scientific

assessments which they concur with, but I think that there are very strong economic pressures in terms of short-term returns which mean that there are decisions taken and attitudes taken which are not necessarily based entirely on scientific evidence.

**Q87 Lynne Jones:** Just a bit of lateral thinking. Could I ask about the potential of marine biomass? One of the issues is the competition for land for biofuels. Some of this competition could be diluted, perhaps, by looking for resources in the marine environment. Is there potential there?

**Professor Beddington:** Yes, I believe there is some work going on on that. You have the issue of mitigating competition on the land, but there is actually quite a lot of competition for the coastline and for the off-shore area, but I think we have got to look at a whole number of solutions and, in terms of marine algae as a potential production of energy crops, I think there is research in there. It is not an area I know particularly well, but I think there is important research being done on this. I think British Petroleum have had a substantial project on it at present, and the Energy Research Institute in California that BP put funding in, which was led by Stephen Chu, the Nobel Prize winner in physics who has just been appointed by President Obama as his Secretary of Energy. The research there, I believe, is also looking at the potential for marine algae as well as lots of other things such as biofuels. We have got such a big problem in energy, food, water and climate change; we have got to look at a lot of possible solutions.

**Q88 Lynne Jones:** I put questions earlier about investment in bio-technology research. Perhaps I could also raise the flag for organic farming and whether there is enough investment put into research of organic methods which may have the potential to help us reduce our inputs into agriculture?

**Professor Beddington:** I think the answer to that one is very much along the lines of my answer to the question about what happens in the developing world for small-scale farming, and so on. I think if there are clear questions from organic farming which are amenable to scientific analysis, we should look to see what is an appropriate level of input for them, but I am afraid my knowledge of other particular scientific questions on organic farming is limited.

**Q89 Lynne Jones:** They just point out that there is so little research effort directed to organic research compared to other aspects of agricultural research. I am not sure whether there are any valid unfunded projects, but perhaps we will be asking them that.

**Professor Beddington:** I guess it really is a question of what are the problems that are amenable to scientific and engineering solutions, and if they are out there, then we can be looking at them.

**Q90 Mr Drew:** We have got the big overall strategy for food, but there is a growing interest—the Chairman is an example—in growing your own,

<sup>14</sup> International Council for the Exploration of the Seas

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28 January 2009 Professor John Beddington

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community agriculture, sustainable local food chains. To what extent is this a bit of a missed opportunity for the scientific community, in as much that there could be some quite interesting, innovative lateral thinking going on to look at how we could restructure the food industry so that we do go back to smaller scale production on a localised basis? Is this something that science ought to say something about?

**Professor Beddington:** I think it is a mixture of science and economics to assess whether that is feasible and the extent to which the local area could generate it, and the implication for industry is more economics and social science than science, but I think if there are questions for the science side of things, it is to look at what is the level of productivity we are talking about and what would be the land use implications for it. One area where we are actually doing some work is that I have a foresight study which started in the summer on the future of land use in the UK in which I am sure we will be addressing that, and that is due to report at the tail end of this year or early next. I think that that is a question that we could be posing there because we are a small island with lots of competing land uses and that is one area where that particular question could be addressed.

**Q91 Chairman:** In conclusion, can I refer to paragraph 33 of your written evidence. You have given us the global figure for the Biotechnology and Biological and Sciences Research Council fund and you have listed a number of areas where that money has been spent—185 million. I wonder if you could provide us with a bit more detail, a break-down of the kinds of things it has been spent on, and what proportion of the work that they are funding is directly relevant to UK agriculture? I am not clear from this whether there are projects within this which have a development perspective. The reason I ask that question is I had the pleasure of visiting John Innes and was very impressed by the work that I saw there, but I said to them: what was their budget? They said the total was 25 million. I said, “How much of that do you get from central funds and how much do you have to go and compete for?” They said, “Roughly 50:50.” So I did my sums: 12.5 million. They spend their time rushing round convincing everybody that they ought to get research contracts, so that is taking their time away from doing their work, and the other 12.5 million they get, I am assuming, from Defra, BBSRC. Then I reflected on the fact: how much does it cost to buy a premiership football forward. We have recently seen the odds upped a bit with a Mr Kaka, who appears to command £100 million, but let us say you are talking 25-30 million, have we really got our proportions of spend right when the entire budget of a place like John Innes would not buy one premiership forward? Are we going to address that issue in terms of what you are doing?

**Professor Beddington:** I take it you are not wanting me to come back to you with comments on the market for professional footballers.

**Q92 Chairman:** I would not expect you to be breeding a little line of those, although it might be quite a good paying proposition! I am more interested in assuring myself that if we are reprioritising investment in this area, 185 sounds a lot but when it is broken down into a myriad of smaller scale projects which have to be funded and I am worried a little bit whether we are going to spread the jam very thinly when there are certain key challenges, which you outlined earlier on, which we have to address if mainstream agriculture and, indeed, aquaculture are going to have a cat in hell’s chance of delivering what the world needs to meet those big global food increase production challenges. I suppose I should sum it up by saying: are you trying very hard in the work you are doing to stop the jam being spread thinly and ensure that it is being focused where it really is needed?

**Professor Beddington:** Yes; I share your concerns. I think there are a number of levels on this, and in terms of responding to the detail of your question, perhaps we could write to you with the information that you asked for, if that is okay.

**Q93 Chairman:** Yes.

**Professor Beddington:** But I would make some comments as well. First of all, in terms of the competition for funds, I see that as quite healthy, in the sense that the fact that you work in a government institution does not seem to me to be a guarantee that you do not have to compete with academic institutions, and so on, for funding. I think that is appropriate. I actually think that the individuals in organisations like John Innes welcome that competition; everybody would like to have very large guaranteed streams of funding, but I think the competition is important and I think that has merit. In terms of the scale of funding, in a sense we discussed that before. I think the scale of funding should go up. I am encouraged that the BBSRC is significantly increasing its funding in agricultural research and I think the explorations I am going to be having in terms of the Food Research Partnership, with Defra and BBSRC, the Food Standards Agency, will relook at that question. Whether in fact there will be a change and whether in fact the question of is it spread too thinly is addressed, I think it should be: because I think one of the points that has been made to me when I visited some of the institutions is just that, that there are too many small scale studies, sometimes desk studies, which are not actually addressing the key and fundamental scientific issues, and that is something I do intend to follow up. That was a point that was made to me two visits ago recently.

**Q94 Chairman:** Good. You have certainly got plenty in the in-tray to keep you occupied. We are very grateful indeed, both for your written evidence and, indeed, the answers to our questions, and thank you for agreeing to supply a little bit more information. If there is anything that you would like to add to

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28 January 2009 Professor John Beddington

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what you have said, either now or in the future as we carry on with our inquiry, we would obviously be delighted to hear from you. It does strike me that you have at least got a measure of the challenges. It

will be very interesting to see how it goes in terms of delivery, but thank you very much for coming and giving evidence to us today.

**Professor Beddington:** Thank you, Chairman.

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**Supplementary memorandum submitted by Professor John Beddington, Government's Chief Scientific Advisor (SFS 31a)**

1. *In paragraph 16 of your written evidence, you refer to the average internal rate of return in R&D projects evaluated in developing countries. Do you have comparable figures for the UK?*

The widely quoted figure for the average internal rate of return of research in developing countries of 43% is drawn originally from *A Meta-Analysis of Rates of Return to Agricultural R&D*, by Alston *et al*, a copy of which is attached.<sup>15</sup> The distributions of rates of return are assessed with reference to factors such as the commodity researched, the geographical region the research is carried out in, and the type of institution funding the research.

The 43% figure is the median rate of return to agricultural research in developing countries. There is no comparable figure given for the UK specifically, however the same source estimates a median rate of return to agricultural research conducted in developed countries of 46%. The mean of the rate of return estimates for developed countries is higher than that for developing countries (98% versus 60% per year). The authors conclude that the rate of return to research may be higher when the research is conducted in more developed countries.

As the authors note, these figures should be treated with caution due to the inherent uncertainties with characterising the benefits of research, and the high degree of noise relative to the signal in the meta-analysis. The rates of return are affected by a number of factors, which can be grouped broadly into four categories: the way the rate of return is measured, the type of research being evaluated, the characteristics of the analysts performing the evaluation and the way the evaluation is conducted.

2. *Is the Pesticides Directive the first EU directive to use hazard rather than risk-based criteria?*

Issues of hazard and risk are relevant to a wide range of legislative areas in the EU, and a variety of approaches to risk assessment are used across these. A comprehensive examination of these areas would clearly be a major undertaking. In responding to the Committee I have therefore focused on those areas most relevant in the context in which the issue was raised during my session with the Committee. There are two examples in particular I would highlight:

- The safe use of chemicals is dealt with under the REACH (Registration Evaluation, Authorisation and Restriction of Chemical substances) legislation, EC Regulation 1907/2006, which includes both hazard and risk provisions, but overall is considered to take a risk-based approach.
- The Cosmetics Directive (76/768/EEC) includes provisions which are clearly hazard-based. The Directive includes a list of around 1,300 substances that are not permitted at any concentration. The list is constructed based on the hazard posed by the substances i.e. those substances that are classified as category 1 or 2 carcinogens, mutagens or reproductive toxins (CMR 1 & 2) are included on the list.

However, a risk-assessment approach is used to set limits for allowable levels of other substances such as preservatives and colourants, which are not CMR 1 or 2.

Thus hazard criteria have been used in at least one previous EU Directive, the Cosmetics Directive.

3. *In paragraph 33 of your written evidence, you refer to a total spend by the BBSRC of £185 million in 2007–08. Please could you supply a more detailed breakdown of this figure?*

BBSRC has provided the detailed breakdown below of its food and agriculture spend by research area (Section A) and Institute (Section B), as well as information on the relevance of BBSRC funded research to UK agriculture (Section C).

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<sup>15</sup> Not printed.

**A. FUNDING BY RESEARCH AREAS**

BBSRC estimated spend in 2007–08 on research relating to agriculture and food was £184.6 million. Table 1 shows the breakdown of this into research areas. Of the total, £66.4 million was on research predominantly relating to plants, £48.8 million on research predominantly relating to animals (livestock and fish), and £30.3 million related to food manufacturing, food safety and (human) diet and health. A substantial proportion of this research (44%) is defined as strategic and applied research.

**Table 1****BBSRC RESEARCH SPEND RELATING TO AGRICULTURE AND FOOD—BY SCIENCE AREA (ALL INSTITUTIONS, 2007–08)**

<i>Research area<sup>1</sup></i>	<i>Estimated research spend<sup>2</sup> (£M) 2007–08</i>	<i>% Basic<sup>3</sup> (Spend)</i>	<i>% Strategic and Applied<sup>3</sup> (Spend)</i>
Plant and crop science	<b>66.4</b>	60%	40%
Animal health and welfare	<b>47.7</b>	40%	60%
Diet and health	<b>14.1</b>	56%	44%
Food safety	<b>10.9</b>	49%	51%
Agricultural systems	<b>7.2</b>	54%	46%
Effects of environmental change on agricultural systems	<b>6.6</b>	45%	55%
Soil science	<b>6.3</b>	48%	52%
Food manufacturing	<b>5.3</b>	27%	73%
Aquaculture	<b>1.1</b>	22%	78%
Studentships (all relevant research areas)	<b>18.9</b>		
<b>Total</b>	<b>184.6</b>	56%	44%

<sup>1</sup> This analysis excluded all spend that does not relate to food and agriculture. The large portfolio of generic biochemistry, cell biology, genetics and structural biology research that underpins all areas of bioscience but which is not specific to food and agriculture or related systems have been excluded.

<sup>2</sup> Figures are based on the primary area associated with individual research projects and exclude the overlaps that occur between science areas, therefore actual spend in any one area (including overlaps) will generally be higher.

<sup>3</sup> Basic and Strategic/Applied research are defined based on the Frascati coding of individual research projects, as used in annual analyses for the Office for National Statistics (ONS). According to these definitions, BBSRC does not support Pure Basic research, but does fund Orientated Basic research that aims “to produce a broad base of knowledge likely to form the background to the solution of recognised/expected problems or possibilities”.

**B. FUNDING OF BBSRC RESEARCH INSTITUTES**

The above figures (Table 1) refer to spend in UK universities, Research Council institutes (including BBSRC institutes) and other eligible institutions. Of the £184.6 million total, £71.8 million was spent at BBSRC institutes. Table 2 shows the BBSRC funding relating to agriculture and food at the BBSRC research institutes; Table 3 shows total income for the BBSRC research institutes, from all sources and for all research areas.

**Table 2****RESEARCH RELATING TO AGRICULTURE AND FOOD AT BBSRC INSTITUTES (2007–08)**

<i>Institute<sup>1</sup></i>	<i>Main research areas addressed</i>	<i>Total research spend (£M)</i>	<i>% Basic (Spend)</i>	<i>% Strategic and Applied (Spend)</i>	<i>BBSRC capital funding<sup>2</sup> (£M)</i>
Babraham Institute (BI)	Diet and health	1.1	57	43	1.0
Institute for Animal Health (IAH)	Animal health	14.1	25	75	17.6
Institute of Food Research (IFR)	Food safety; Food manufacturing; Diet and health	10.8	43	57	1.3

<i>Institute</i> <sup>1</sup>	<i>Main research areas addressed</i>	<i>Total research spend (£M)</i>	<i>% Basic (Spend)</i>	<i>% Strategic and Applied (Spend)</i>	<i>BBSRC capital funding</i> <sup>2</sup> (£M)
Institute of Grassland and Environmental Research (IGER)	Plant and crop science	5.9	61	39	4.1
John Innes Centre (JIC)	Plant and crop science	17.2	54	46	2.3
Roslin Institute (RI)	Animal health; Agricultural systems	6.8	46	54	1.8
Rothamsted Research (RR)	Plant and crop science	15.9	30	70	6.4
<b>Institutes Total</b>		<b>71.8</b>	<b>41</b>	<b>59</b>	<b>34.6</b>

**Table 3**

## TOTAL INCOME OF BBSRC INSTITUTES (2007–08)

<i>Institute</i> <sup>1</sup>	<i>BBSRC funding</i> <sup>3</sup> (£M)	<i>Other funding</i> (£M)	<i>% BBSRC funding</i>
Babraham Institute (BI)	25.1	8.1	76
Institute for Animal Health (IAH)	31.9	13.5	70
Institute of Food Research (IFR)	12.8	4.5	74
Institute of Grassland and Environmental Research (IGER)	10.0	9.6	51
John Innes Centre (JIC)	23.2	7.2	76
Roslin Institute (RI)	11.6	9.0	56
Rothamsted Research (RR)	23.7	9.6	71
<b>Institutes Total</b>	<b>138.3</b>	<b>61.5</b>	<b>69</b>

Source: BBSRC Annual Report 2007–08

<sup>1</sup> Includes BBSRC-sponsored Institutes receiving core funding from BBSRC in 2007–08. Roslin Institute (RI) transferred to the University of Edinburgh on 1 April 2008; IGER transferred to Aberystwyth University (as the Institute of Biological, Environmental and Rural Sciences, IBERS) on 1 April 2008.

<sup>2</sup> BBSRC capital funding includes a representative proportion of total BBSRC capital funding to the each Institute, based on the proportion of research spend included in this analysis. Percentages of total BBSRC capital funding included here are as follows: 100% (IAH, IFR, IGER and RR); 90% (JIC); 80% (RI); 10% (BI).

<sup>3</sup> BBSRC funding includes Core Strategic Grant funding, research grants and capital.

## C. RELEVANCE TO UK AGRICULTURE

The majority of BBSRC research spend is of direct short or long term applicability to the UK agriculture and food sectors, as well as being of international relevance. BBSRC has a small number of programmes in agriculture and food research concerned solely with international development, primarily relating to sub-Saharan Africa or South Asia, and with co-funding from DFID. Most of these grants, awarded through the Sustainable Agriculture Research for International Development initiative, started after 1st April 2008 and therefore contributed only £0.1 million to the total research spend in 2007–08. Total commitment to this initiative is £6.83 million, of which the BBSRC contribution is 33% and the remainder from DFID.

February 2009

**Supplementary memorandum submitted by Professor John Beddington, Government's Chief Scientific Advisor (SFS 31b)**

1. *The notes to Table 1 (of the supplementary written evidence submitted by Professor Beddington in February) state that Basic and Strategic/Applied research are defined based on the Frascati coding of individual research projects. Would it be possible to supply the Frascati definitions of Basic and Strategic/Applied research?*

The Frascati guidelines are drawn from p 30 of the 2002 *The Frascati Manual: Proposed Standard Practice for Surveys on Research and Experimental Development*, published by the OECD.<sup>16</sup>

The "Frascati" guidelines split R&D expenditure into three categories:

- *Basic Research*: Basic Research is experimental or theoretical work undertaken primarily to acquire new knowledge of the underlying foundations of phenomena and observable facts, without any particular application or use in view.
- *Applied Research*: Applied Research is also original investigation in order to acquire new knowledge. It is, however, directed primarily towards a specific practical aim or objective.
- *Experimental Development*: Experimental Development is systematic work, drawing on existing knowledge gained from research and practical experience, that is directed to producing new materials, products and devices; to installing new processes, systems and services; or to improving substantially those already produced or installed.

2. *For Table 1, would it be possible to provide the same information for the research spend relating to agriculture and food 10 and 20 years ago? The Committee appreciates that the BBSRC was not established until 1994, so the figures for 20 years ago would not be directly comparable.*

Detailed research spend comparable to that provided for 2007–08 (split by food research areas) is not readily available for 10 and 20 years ago. However, BBSRC have supplied trend data over the last seven years, and some information from published sources for 20 years ago.

In summary, spending of the AFRC in 1997–98 was £49.5 million, while spend by the former Science and Engineering Research Council (SERC) on research related to agriculture and food was a proportion of £50.7 million spent by the Council in the Environment, Biotechnology, Process engineering and Biology areas. Note these figures are not adjusted for inflation.

FOOD-RELATED RESEARCH TRENDS 2002–09

**BBSRC RESEARCH SPEND—SUMMARY**

	2002–03	2003–04	2004–05	2005–06	2006–07	2007–08	2008–09
<b>Total estimated spend on research relating to food (£M)</b>	<b>132</b>	<b>129</b>	<b>138</b>	<b>150</b>	<b>171</b>	<b>185</b>	<b>189</b>
Total gross expenditure (taken from annual reports) (£M)	264	264	268	304	351	380	N/A
% of total BBSRC gross expenditure which is on research relating to food	50%	49%	51%	49%	49%	49%	N/A

Total BBSRC gross expenditure (taken from BBSRC Annual Reports) is also shown, together with the % of that total which is spent on research relating to food.

Please note the following:

1. Figures shown above for research relating to food represent estimates but the BBSRC believe they are reasonably robust. They are based on the same research categories as recently supplied to GO-Science for 2007–08 and 2008–09 spend. This included research on the following areas: plant and crop science (including the control of pests and diseases); soil science; aquaculture; animal health; animal welfare; food safety; food manufacturing; diet and health; effects of environmental change on agricultural systems; and agricultural systems.
2. Spend in 2002–03 was slightly higher than in 2003–04—this was due to higher institute capital spend in 2002–03.
3. There is a gradual increase in actual spend from 2003–04 to 2008–09. Relative to total BBSRC gross spend, the investment in research relating to food has been stable across the seven years from 2002–03, averaging around 50%. This evidence is consistent with other analyses. Investment in

<sup>16</sup> OECD PUBLICATIONS, 2, rue André-Pascal, 75775 PARIS CEDEX 16, (92 2002 08 1 P) ISBN 92-64-19903-9—No. 52703 2002.

plant and crop science (which represents much of this analysis) has been fairly stable over these years and has only increased in latter years (i.e. 2007–08 onwards)—a consequence of recent crop science initiatives. Returns to the Office of National Statistics, which include a category for agricultural research (NABS code 6), suggest a gradual decrease (as a % of total BBSRC spend) across these years. However, the scope of the NABS 6 analysis is narrower than this one, representing around half of the research portfolio included in this analysis.

#### FOOD-RELATED RESEARCH SPEND 20 YEARS AGO

Total research spend awarded through the former Agricultural and Food Research Council (AFRC) was £49.5 million in 1987–88, all of which is assumed to be relevant to agriculture and food and therefore comparable to the BBSRC data provided for 2007–08.

In addition, some of the total research spend (£334.5 million) awarded through the former Science and Engineering Research Council (SERC) is likely to have been relevant to agriculture and food; in particular, some (though not all) of the research awarded through the SERC Engineering Board (Environment area, £10.5 million; Biotechnology area, £5.5 million; Process engineering area, £7.2 million) and the Science Board (Biology area, £27.5 million). The total research spend awarded by SERC through these potentially food-related areas was £50.7 million, a proportion of which is likely to be relevant to food security. Note these figures are not adjusted for inflation.

BBSRC was established in 1994 by incorporation of the former Agricultural and Food Research Council (AFRC) with the biotechnology and biological sciences programmes of the former Science and Engineering Research Council (SERC).

*May 2009*

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## Wednesday 4 February 2009

Members present

Mr Michael Jack, in the Chair

Mr David Drew  
Mr James Gray  
Lynne Jones  
David Lepper  
Miss Anne McIntosh

Dr Gavin Strang  
David Taylor  
Paddy Tipping  
Mr Roger Williams

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### Memorandum submitted by Chatham House (SFS 66)

#### *How robust is the current UK food system?*

1. The UK's food system is essentially robust in terms of its ability to maintain consumer access to food in the face of stresses and shocks. But that status cannot be taken for granted. There is a need for active monitoring and management of contingent risks. There are some structural weaknesses in the domestic supply base. And there is a set of systemic challenges to the food system that require action now if its resilience is not to be tested more severely in the decades ahead.

2. In discussions of security and supply, it is difficult to talk sensibly about a single picture for "food" as a whole because of the diversity within the system. In farming, the issues facing cereal growers, poultry producers, horticulture, etc., vary. This diversity is also present further down the value chain in food processing and manufacturing.

3. A great variety of foods are supplied to consumers reliably, week in, week out. There are powerful incentives for individual retailers and their suppliers to identify and manage risks to supply. When individual sources of supply go offline, whether for predictable reasons (such as seasonality of supply) or unpredictable reasons (such as animal disease outbreaks or severe weather), the food chain has proven adept at sourcing alternatives. Indeed, in modern times UK consumers enjoy access to a greater variety of food, at more affordable prices, and with more continuity of supply than any time in history. This access is, for many, something to be taken for granted.

4. The UK enjoys access to a variety of food sources that helps diversify risk. It sits within a single European market for food and, of the food that we do not produce ourselves in this country, the majority is imported from within the EU, or members of European Economic Area (e.g. fish from Norway and Iceland). The UK imports the remainder of its food from a wide variety of different countries. Many of these imports are of foods that cannot be grown here—rice, bananas, oranges, etc.

5. There is a continuing need to monitor and manage threats to the food supply and distribution posed by the basket of contingent risks that remain present. For example:

- *Food contamination.* Food safety has greatly improved over the years. Understanding of food related risks and how they are linked to methods of production, processing, storage etc. is increasing, as is our ability to detect contaminants in our food. But there remains potential for accidental or malicious contamination, that could affect the consumer health and confidence in the food system. The Sudan I incident in 2005 showed how a defective source of an ingredient can spread contamination far and wide through the food chain.
- *Failure of food logistics systems.* Food logistics are predicated on availability of transport infrastructure, including good links to the rest of Europe. Contingency planning for loss of key infrastructure should take into account food supply requirements. The "just-in-time", low inventory models of the contemporary food system have *potential* vulnerabilities. Multi-national supply chain structures, with longer logistic pipelines and disparate assets could be particularly exposed in a crisis event. Planning for scenarios that compromise the functioning of the food logistics system, such as an avian flu epidemic or energy shortages, needs to take into account food supply and distribution requirements.

6. There remains the possibility of "shocks" to the system being delivered through global markets. Food chain enterprises face continued volatility in commodity markets, both for inputs (e.g. animal feed, energy, fertiliser) and outputs. Severe inflationary effects on commodities and input prices over a sustained period also have the potential to tip supply chains into a crisis situation, particularly if the cost absorption through the chain is disproportionate to retail price rises. The interface between global market trends and regional regulations can introduce additional stresses, as with the import of GM animal feed to Europe. Europe's reliance on inputs from elsewhere, such as animal feed and oil, is just one illustration of the fact that the security of food supply cannot be measured by end-product self-sufficiency.



7. The resilience of the UK food system has to be considered within its European and global context. In many instances, the systemic issues are global in nature. They apply to the UK but also exist in most other parts of the world. The UK cannot fully isolate itself from global events—dysfunction in EU or global markets has an impact on UK consumers and producers. So it is in the UK’s interest to ensure that the global food system is operating sustainably. But in turn, the focus for UK food security should not solely be on the global picture, without considering the long term resilience and viability of the UK food system.

8. The long term challenges are fundamental. Many stem from processes deeply embedded in the structure of the modern food system. The environmental and resource challenges include:

- the need to radically reduce the greenhouse gas emissions produced by the food system;
- reducing the end-to-end dependency of the food chain on fossil fuels (given climate change and expectations of higher energy costs in the decades ahead); and
- depletion of the natural resources and ecosystem services on which food production depends (e.g. soil, water).

9. These need to be addressed while meeting the dietary needs and aspirations of a larger and (we hope) wealthier global population. And in ways that help to reduce the inequalities of food security that are seen in the world today.

10. Ultimately it is consumers’ choices about how and where they spend money on food that dictates the patterns of wealth creation and environmental impact in the supply chain. Their dietary choices, and their willingness to pay a premium for products of assured provenance, are key system drivers. So consumers need to be part of this debate and engagement by industry (including farming) with them needs to be part of the process of change.

11. In that context, the growth in popular interest in food in the UK—where it comes from, how it is produced, what it does to us—is the single most positive trend in the food system today. Harnessing and developing that interest is going to be critical to the future of UK farming, and to the prospects for the transformation of the wider food system to a more secure and sustainable model.

12. A UK food and farming sector that, by virtue of the productivity it achieves and value it generates, is competitive in local, European and global markets will succeed in servicing both domestic and overseas demand. In some sectors, further restructuring is likely to be required before economic viability is the norm.<sup>1</sup> And there is a long way to go before the system exhibits environmental sustainability.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

13. In many areas of the debate about food supply and food security, it is necessary to move from the generic (“food”) down into food groups or particular markets (e.g. cereals, red meat, poultry) to have a coherent discussion because the opportunities, constraints, production patterns and conditions for trade differ widely among them.

14. It is common to focus first on cereal production. Embedded within projections such as those in the question above are choices about how much grain production is diverted to non-food uses (such as biofuels), and dietary trends and choices (such as propensity to consume meat).

15. There is a need to raise the productivity of food production, here in the UK and overseas, but in a more sustainable way than we have managed in the past—producing the foods that consumers want to buy at the price they are prepared to pay, but doing so using inputs more efficiently and reducing waste and pollution.

16. Raising aggregate output on the scale indicated will require changes that include:

- an increase in the baseline yield potential of the major traded grains but also of the crops grown in sub-Saharan Africa and elsewhere that are not widely traded;
- a reduction in the yield losses due to pests and diseases;
- interventions that reduce post-harvest losses; and
- adaptation to climate change effects.

17. In contrast to the previous Green Revolution, these yield improvements need to be made at the same time as the climate is shifting, greenhouse emissions are being reduced, and key inputs such as water are becoming more scarce in many areas. More sustainable farming systems and farm technologies are needed.

18. This is at heart an innovation challenge. As a wealthy nation with a strong scientific tradition and a sophisticated arable farming sector, and as a country where there is an appreciation of the challenges ahead, the UK ought to be as well placed as any to engage with them and seize the opportunities therein. The issue is whether we will chose to do so.

<sup>1</sup> See, for example, the report of the Northern Ireland Red Meat Task Force.

*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

19. The UK food market is highly diverse, but key themes include healthier eating, convenience and a growing interest in provenance. The last ten years have seen a growth in consumer interest in food, how it is produced and where it comes from. This is not universal but it is widespread and is a hugely positive development. The current economic conditions may suppress people's ability to pay for "better" food. However, this trend seems likely to re-establish itself when recovery comes, though it will be repressed if food prices remain at a higher level than we have become used to over the last two decades (as is possible).

20. If that interest can be sustained and widened, the prospects for the UK food system and UK farming are far brighter than if it withers. It seems likely that the long term future of a large part of the UK farming base (especially that beyond the cereals sector) depends on consumers being willing to pay more than the minimum in order to access UK-produced food—directly or by shopping at supermarkets that "edit" that choice for them.

21. The future ought to be about a food system built around sustainable, healthy diets. But there is a long way to go on all counts. And the transition has its own embedded challenges, for instance:

- significant progress towards the "5 a day" target for fruit and vegetable consumption is a very high priority from a health perspective, yet the UK imports 90% of the fruit consumed here (by value) and a significant share of its vegetables, despite efforts to extend seasonal availability of UK production; and
- decline in red meat consumption (for health or environmental reasons) erodes domestic markets for UK livestock producers, many of whom are already unprofitable.

22. Local food networks help harness interest in food. They can help in reconnecting people with how food is produced. They can also help building social capital in communities. But provenance is not the whole story—changes in the types of food people buy matters too.

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

23. The Government's response to the food price crisis has included significant support for international crop research effort, focused on raising yields in developing countries. It is time for Defra to launch a process to look at whether public investment in research, development and deployment of solutions to the challenges facing the food chain is adequate and appropriately allocated in the UK and in the European Union.

24. Defra should also lead the development of a "vision" for the reshaping of a food system into a form that is productive, competitive, and resilient but also sustainable. Research for the Chatham House *Food Futures* report uncovered conflicting and wide ranging views over how the future food supply system should develop. While there is not necessarily one right pathway to meeting future challenges, it is important that there is an overall coherent framework/roadmap that helps to guide and shape behaviours. Defra are in the position to convene this debate. The vision needs to articulate in some detail; the desired outcomes from the system its principles and attributes as well as the debate around the choices that need to be made in reconciling the goals of sustainability with competitiveness and resilience. It also needs to be developed in conjunction with a wide range of food supply stakeholders—the private sector along with non-governmental organisations have to play their part in shaping the new system.

25. Defra could also, with the industry, develop a clearer vision for how the productivity of UK farming is to be enhanced in order to seize the market opportunities and deal with the environmental challenges it faces. This does not imply maintaining the status quo in the industry structure; there are areas where further change is inevitable. In areas like the uplands, there will be choices about how land is to be used and the environmental and economic services we want it to support.

26. Through its work on UK food security it should provide a coherent risk management framework through which the short, medium and long term risks to food security can be monitored and managed.

27. It should, working together with other departments, look for opportunities to strengthen public interest in food and in sustainable, healthy diets, by building on initiatives such as, the Year of Food and Farming.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

28. The governance of the food chain is highly complex. Government input ranges from the global (e.g. Codex Alimentarius), through the regional (e.g. the EU), to the national (UK), the devolved (e.g. Scottish Government) and the local (e.g. local authority trading standards). Many of the rules and standards in the system are set within the food chain by private sector agents, rather than by legislators and regulators.

29. The recent Cabinet Office report *Food Matters* set four strategic policy objectives for UK food policy. These commit the Government to engaging with the environmental, safety, economic and environmental challenges facing the food system, in concert. The report defined the policy architecture—from vision through strategy to decision-making machinery—that would help government make progress towards these objectives.

30. The onus is now on Defra to develop policy within that framework and accelerate the process of change. This will require it to work with other parts of Whitehall, with the devolved administrations and engage with the European Commission. And for government as a whole to engage with industry in a joined-up way.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

31. Although the UK can make a direct contribution through its own food output, the share of incremental global food demand that can be met from domestic production is very modest. Even today, with its high relative efficiency, the UK's cereals sector accounts for less than 1% of world grain production. It is generally acknowledged that the greatest latent potential and the greatest need for global food production increases is in the developing world. Long term global food security requires that this potential is realised.

32. There is no economic or environmental rationale for government to set targets to raise UK output of particular food products (whether expressed in calories, kilos or dollars) in step with changes in global food demand.

33. The UK's indirect contribution to the global challenge is potentially far more significant. This indirect contribution can be made through applying the UK's capacity:

- for scientific and technological innovation; and
- to lead and influence relevant EU and international agendas on issues ranging from climate change to trade.

34. The UK's responsibilities are therefore to:

- Support the development of a productive, competitive UK food sector that is founded on sustainable technologies and business practice. A more successful UK food industry will win market share and make a greater contribution to overall world demand.
- Use its influence to encourage policy changes in Europe and worldwide that foster conditions which support the competitiveness of economically, environmental and socially sustainable practices—such as responsible governance of water resources, carbon pricing, labour rights and openness to trade.
- Invest in the supply of the basic knowledge that will underpin the techniques and technologies of the future food system—both here in the UK and for the developing world.

35. From this flow the following types of indicators:

- Change in total factor productivity within the UK food chain, looking at key farm and manufacturing sectors.
- Positive changes in EU/international policy and qualitative assessment of UK influence on those processes.
- Citations of scientific papers that have UK based authors in areas of science relevant to the long term challenge, such as crop science.

36. This monitoring framework is not the same as that required to monitor UK food security—it is tracking performance against a different problem.

This document was prepared jointly by Andrew Jarvis, a Senior Research Fellow in the Energy, Environment and Development Programme at Chatham House and Kate Bailey, a Senior Research Associate within the Food Process Innovation Unit at Cardiff Business School. Andrew recently joined Chatham House to direct its work on food policy and food security. Kate led the research team for the food supply project convened by Chatham House which culminated in the recent report *Food Futures: Rethinking UK strategy*.

January 2009

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*Witnesses: Mr Andrew Jarvis and Ms Kate Bailey, Chatham House food supply project, gave evidence.*

**Q95 Chairman:** Welcome to our second evidence session into our inquiry on food security and welcome to our first set of witnesses from Chatham House in the shape of Kate Bailey and Andrew Jarvis. I think, Mr Jarvis, you were the Deputy Director of the great team which produced the Cabinet document *Food Matters: Towards a Strategy for the 21st Century*. Are you the aforementioned Mr Jarvis?

**Mr Jarvis:** Guilty, yes.

**Q96 Chairman:** You plead guilty. Very good. I know you came to talk to us before, so I know you know all about food, so that is jolly good. One of the things which comes through from reading the literature in this area is that if one takes as benchmarks the target that the world has got to increase its food production by 50% by 2030 and double it by 2050 those are very long-term programmes to achieve those, if you like, two simply stated global targets. Do you think the political cycle is compatible with the nature of the long-term work which will have to be undertaken if collectively the United Kingdom and its partners in the world are actually to ultimately achieve the objectives set by those two benchmark targets?

**Mr Jarvis:** Good question! There is clearly an issue in terms of climate change about the challenge of meeting long-term targets, action now and possibly foregoing benefits in welfare now in the interests of long-term gain. That is a recognised part of the political economy of the climate change debate. In relation to the food supply question, there is clearly an overlap but I am not sure that the trade-off patterns are necessarily quite the same, for example in terms of the investments we could be making now in innovation for high productivity and lower impact. Those ought to be, it seems to me, achievable within the timescales available.

**Q97 Chairman:** I suppose what was going through my mind was that the Government has recognised quite clearly the importance of climate change and they have got a target with legislative backing to it, so there is something all the time to test progress towards whether we are going to make it. But one thing which worries me about all this is that when you look at all the work which everybody says has got to be done to try and respond to the agenda which is now emerging to deal with this subject, most of the things which have to be done, if they are scientific, organisational food chain based, are all going to take quite a long time to evolve and yet our Parliament sort of chugs along on roughly a four yearly cycle and it is not always easy, because of change in political priorities, to sustain that type of long-term work. So given that you have identified an awful lot of things in your own evidence to us which need to be done, how do we keep people's noses pressed closely to the grindstone on this?

**Mr Jarvis:** There is a couple of timescales over which these things play out. If we look at any particular sector now, there will be a range of performance in terms of financial performance, environmental performance matrix and we can have policies now which endeavour to raise the average, raise the bar,

squeeze the long tail of the poor performers and move more towards the leaders. Then there is the longer term trend of moving the technology curve, the practice curve, forward, which will require a complementary set of policy initiatives. I am not sure it is that different from the way we manage and try to promote technological change in other areas of the economy.

**Q98 Chairman:** I think what I am trying to pin you down on, because you understand how government works, is what sort of mechanisms should a committee like this be recommending in a report such as the one we are producing to ensure, if you like, that the same long-term view as is being taken of climate change is also put in place to deal with the challenges of food security?

**Mr Jarvis:** To turn that around a little bit, I think a good start would be to ensure that there is a common understanding, so that if we think food security is the problem, particularly for the UK, there is a common understanding of what the problem is. There are lots of different views on that and the term is used in lots of different ways and it is, frankly, a deeply confused debate. It would be quite helpful if some of that confusion was dissipated through us getting to the point where we have a clear understanding of what the problem is. There are going to be various dimensions to that problem. There are short-term issues, basically almost civil contingency things which could interrupt our security of supply. Then there are these longer term challenges for the UK, and the global ones. We should be able to understand what sets those apart and develop appropriate indicators for monitoring them and managing them where appropriate. The tools we use for managing the risk of failure of food logistic systems tomorrow are going to be different from the tools we use and operate, because obviously they are over different timescales, to those we use to make sure we have got adequate yields of drought-resistant wheat for 2050, to do our bit to feed the world and providing for the British food chain.

**Q99 Chairman:** Mr Jarvis and Ms Bailey, could I ask you both—and I know, Ms Bailey, you have not said anything yet—when you speak, could you use a little more volume because I sense there are one or two people in the audience who are desperate to hear what you have to say but who are struggling with the rather bizarre amplification in this room to hear your pearls of wisdom, so if you could just bear that in mind, that would be very helpful indeed. When we had the Secretary of State in front of us and we said, “What is your current priority?” about two months ago. Now he has lost climate change as the main driver for the Department, he hesitated for a millisecond and then said, “Food.” So we thought that was jolly good. He did not immediately offer to take the Committee out for dinner to talk about it, but he did say the priority was food. How do you rate Defra's performance as a department ever since it was incepted, which has had “Food” in its title?

4 February 2009 Mr Andrew Jarvis and Ms Kate Bailey

How do you rate its performance in the context of its food responsibilities? What do you think those responsibilities are?

**Ms Bailey:** From the research we did with the Chatham House Report I think the feeling from stakeholders is that Defra's focus has been very squarely in the agricultural sector, so if you are talking about food as a whole it has kind of ignored the rest of the food supply chain. That is one particular critique of them. Secondly, that its focus on agriculture has been very much on the concern of climate change and the sustainable elements of agriculture and while there have been some small elements of money and some help given to agriculture to be more productive, there is definitely a feeling that this needs to change in that the focus has to be about how do we make agriculture for food both productive and sustainable and that no longer can those two paths be separate and that they need to be joined together in the policy objectives.

**Q100 Chairman:** Do you sense that Defra is now an enthusiastic player in the discussions which have been taking place about the production of food, or has it been dragged kicking into something it does not really want to get involved in because it is more interested in doing something else?

**Ms Bailey:** I would say about two and a half years ago, when we first started the Chatham House Project, while our project was not specifically looking at food security, it that definitely was not an issue that Defra was considering. We have seen, and hopefully as part of the process of doing our research, that Defra has become more involved and is starting to take more of a proactive stance in terms of starting to outline better food-based policy and start to think about food security, but I would say that still from stakeholders we are getting the feeling that they needs to be more proactive and take more of a lead in terms of pulling together the different strands. Food is so complex. It cuts across so many areas and it is about how they can start to pull those strands together into some sort of overarching vision, strategy, that is for the whole food supply.

**Q101 Chairman:** Let me just ask you a couple of brief things before passing on. I mentioned at the beginning about the benchmark targets which came out of the FAO in June last year. Do you think we have a responsibility in this country to play our part in increasing the amount of food which is produced, because there is a lot of discussion in the literature about our place as a trading nation as opposed to our place as a place where food is produced and the figure of only 1% of world food supply, 1% of arable crops, is often quoted to put us in context, almost to say we are not really a significant player. Nonetheless, should we make a contribution to achieving those global targets?

**Mr Jarvis:** Our view on that is that one needs to avoid confusing means and ends. If we focus on developing a productive and competitive British food sector, broadly stated, end to end, that is sustainable in economic terms and in terms of the broader climate challenges to be faced, then it will do

its part. It will win market share. It will do its part both in feeding us and contributing to solving the broader global problem. As you point out, it is clearly not the case that we can deal with the global problem through the feasible incremental changes in output in the UK. That proposition is a non starter. Focusing on that sustainable competitiveness and productivity, together with the indirect things the UK can do to effectively leverage its influence on the global problem, through things like investing in basic research, creating public goods which are going to help solve this, not just for here but for elsewhere, creating solutions that we can sell to the wider world, is a means of doing more than is feasible off the arable fields of the east of England.

**Q102 Mr Williams:** Kate Bailey said that Defra does not take responsibility for the whole of the food chain, but as I understand it they have only got responsibility up to the farm gate. The Department of Health has responsibility for a lot of other issues and perhaps the Department for Business has responsibility for competition, so part of the problem is that there is confusion and nobody is actually taking hold of the real issue, the total problem and the total issue?

**Ms Bailey:** Yes. Andrew is probably in a better position to answer this because the *Food Matters* report identified that the responsibility cuts across the many governmental departments and there is a need for a better framework for government departments to work better together and for Defra to take a lead on that.

**Mr Jarvis:** The basic proposition of the *Food Matters* work is that the food basis is a complex area which government has to deal with. There are many departments which have an interest in it because there are many aspects of public interest in it, aspects of food safety, public health, environmental impact and the 3.7 million jobs associated with the food chain. It is a challenge for all the stakeholders, whether it is supermarkets or governments, to manage that complexity. What *Food Matters* tried to do was set out an architecture for managing that from the point of view of a joined up vision at the top, through a strategy which pushed against the four key objectives it set out, and there is a machinery underneath (committees and the like) to try and bring people together so that in the future we ought to have the means of making those linkages. Now, it is early days and I am no longer in the Cabinet Office, but I would hope it is moving forward.

**Chairman:** Just before I pass on to David Taylor to continue our questioning, you said it would be very useful if we could actually have a definition of what we meant by "food security". Would you like to go away after you have given your evidence today and think about what your definition, as Chatham House, would be of that and let us have an answer, because we asked Professor Tim Lang to do the same thing. I am collecting definitions!

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4 February 2009 Mr Andrew Jarvis and Ms Kate Bailey

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**Q103 David Taylor:** I think for the Committee, Chairman, answering that question at least in part, we feel that robustness is a key quality, and indeed it was the first category, I think, which we listed on the sheet where we were asking for evidence to be submitted. You may be aware of the City University's report three months ago, the Centre for Food Policy, called *Towards a National Sustainable Food Security Policy*. They were (no pun intended) more robust about the robustness of the UK food system. They said that there was no sense of threat in the short-term, that the food supply chain worked well and had good levels of resilience. You were a shade more cautious in the opening paragraph of your submission. You stated that it was essentially robust and could maintain access in the face of stresses and shocks, but you then went on to observe that there were some structural weaknesses in the domestic supply base. I do not know whether by that you mean poor integration of primary production and processing and retailing, but perhaps you had something else in mind. Could you just elaborate on that a little?

**Mr Jarvis:** Yes, of course. Part of the issue here is the distinction between the function of the system as a whole, who it is serving, and the welfare and health of the components of it. There are issues, as you rightly point out, in terms of the function of the individual supply chains, which have been picked over and the Curry Commission set out an agenda in relation to aspects of that which I think remains valid. There are issues on the production side, which I am sure you will know better than we do, about particular sub-sectors which are struggling in terms of the proportion of enterprises which are turning a profit. In the pieces of work I have done in the past, red meat production, the beef and sheep sectors, tend to come out from the data as particular parts where many of the enterprises are struggling. Sectors which are struggling is not what you want to see in the context of this proposition of a sustainable, competitive supply chain.

**Ms Bailey:** I think I would say also that through the Chatham House research, which looked at four different scenarios, one of the scenarios was a global food crisis and when we ran this through various experts and stakeholders from the industry they saw that there was potential for a global food crisis to spill over into the UK either through price shocks or short-term shortages. So we cannot afford really to take our food for granted in that there is this possibility of food global influences combining in certain ways which then create very difficult trading circumstances and very difficult circumstances which could cause some problems in the UK. I think it would be silly of us to ignore that. It is actually about being aware of these potential threats and putting in place proper risk management frameworks, contingency planning.

**Q104 David Taylor:** Which do you think is the most significant of the weaknesses which you have just identified in the domestic supply base, one which maybe Government can try to do something about?

**Mr Jarvis:** My take on this is that in our focus on the long-term challenges, which are pretty fundamental—the prospect of trying to effectively pull greenhouse gas emissions out of the food chain is a challenge which is going to keep a lot of people busy for a very long time—we do not want to forget about the fact that there are other things, perhaps in the medium term or short term, which we also need to keep monitoring and managing. To anticipate our answer, a little bit, to your question about the definition of food security, we should be considering short, medium and long-term issues and the various dimensions of risk. So the prospect of the impact of avian flu on the function of the distribution system and our ability to continue to put food in the shops, all sorts of global events, need to be as much part of our view as climate problems.

**Q105 David Taylor:** You say you have talked to experts worldwide. I think we are less likely to snap to attention and defer to experts in the light of what has happened in recent times in the finance sector. God save us from experts! What modelling have you done in relation to some of the factors you are describing which have an impact on production and sustainability, and so on? There must be something which you work with. I am not talking about some sort of prices model, but do you have access to or do you utilise your own modelling, or do you just talk to experts?

**Ms Bailey:** The way the project was actually constructed is that it was not based on any econometric model but it was based on research into trends and data of global factors and events which are readily available, and it was understanding how those various trends can combine. So how would population growth, climate change, the availability of land and water and resources, how would these various factors combine, effectively a thought experiment which we then group them into the four different scenarios you can see in the report. It was about thinking through with—when I say “experts” I mean people within the food supply system within the UK, and you have to hope that they know what they are doing because they are part of that scenario—to think through how these potential effects start to impact on the UK and through that process we are able to start to understand that there were some key dependencies of the food systems and interdependencies which could be at risk. I would say that a lot more research needs to be done. There needs to be more understanding of the food supply system: where actually are these key dependencies and the potential vulnerabilities, and what are those threats which could impact on food security going forward?

**Q106 David Taylor:** A major characteristic which would influence things in a very significant way is price and you yourself say in paragraph 6 of your submission that severe inflationary effects on commodities have the potential to tip supply chains into a crisis situation. This is getting to be quite dramatic language. Could you just expand a little for the Committee on that point, please?

4 February 2009 Mr Andrew Jarvis and Ms Kate Bailey

**Ms Bailey:** One of the scenarios which we constructed looked at a global event either through climate change, through an extreme weather event, or through animal disease, which starts to restrict supplies of key commodities. This then sends huge price shocks around the world, not just the food commodity price but also oil, and also inputs, so things like fertilizer prices start to rocket. When we put this in front of the stakeholders we gathered, it was seen that these global price shocks could have a huge inflationary effect on prices in the UK and if those prices were unable to be passed on to the consumer, the supply chain itself would be unable to absorb all of those price rises and therefore could start to inhibit the actual sale of goods along the supply chain, and that would effectively tip into a crisis situation.

**Q107 David Taylor:** Just one final question. There is a phrase within that same paragraph which talked about the crisis situation and you qualified it by saying, "particularly if the cost absorption through the chain is disproportionate to retail price rises." Could you put that into the Queen's English?

**Ms Bailey:** Yes. This was again in reaction to the scenarios in that if there are extreme inflationary effects, particularly on input prices into agriculture (fertiliser, oil, et cetera), and those costs are not passed down the chain, in that the retailers are trying, as is their want, to be competitive and to reduce the cost to the consumer, producers particularly would be vulnerable there and unable to cover their costs of production and that would then cause problems in supply ultimately if that continued for a long period of time.

**Q108 David Taylor:** What we are seeing to an extent, in a small way, in the dairy price reductions in this country at the moment? Retailers are trying to reduce the farm gate price of milk yet again. Is that something you have observed at all?

**Ms Bailey:** Obviously this has been an issue with the dairy sector for quite a while and I think there is an issue over the cost of production versus the retail price.

**Q109 David Taylor:** One last question. Are you happy with the access to modelling information and modelling systems, because there are problems? Obviously you are looking back on what has happened in the past over the last decades and generations. You are driving forward using the rear view mirror. I wonder what attempts are made to try and identify trends which were not present in the past and to try to evaluate how significant they will be in terms of price or supply, whatever it might be, climate change?

**Mr Jarvis:** It is not something I have looked into directly. My suspicion is, off the back of the events of the last 18 months, there are quite a lot of people around the world taking a look at their models, brushing them up and developing them. The debate which was taking place a year or so ago, and more recently over biofuels, for example, yielded as many estimates of the relative impact of those things on

price, even on a short term basis, as there were analysts looking at it. It is coming out of an era where prices have been relatively low for a long period of time and, notwithstanding the 950 million people who do not get enough to eat, there has been for much of the world a surplus. I suspect this has not been top of everybody's list of research topics.

**Q110 David Taylor:** Sorry, that was the last but one question. This is the last one! You look, presumably, at the effects and impact of futures markets, do you, in food, particularly in the large highly developed countries such as the States and Western Europe?

**Ms Bailey:** Again, it was not any econometric model. We did not look at the economics and the impacts of speculation, but if you look at the various research which is out there, there is a wide variety of views as to how much impact speculation has had on the price rises we saw last year. So in one of the scenarios we did play a part in speculation that it did cause some of those price hikes.

**Mr Jarvis:** There is an additional point which is worth making, perhaps, which we alluded to earlier. It is quite difficult to get very far with discussions of food security while talking at the sort of level of "food". You actually start getting much more traction off them by bringing them down into discussions of commodities. There are huge differences in the issues and the challenges for us in the UK and more broadly. The patterns of crop reduction, trade, and environmental vulnerabilities for, say, vegetable production are completely different from those for red meat and grain. To get traction on these other things you do have to go down a level. Unfortunately, it adds another dimension of complexity, but it is actually at that level where you start to get the insights which start to be helpful.

**David Taylor:** I just think the futures market is supposed to provide stability and certainty and it is more likely to provide volatility, but there we are.

**Q111 Mr Drew:** I just wondered if you looked at some movement away from the choice-based system. The whole basis of food is that if you can afford it, you can get it, and yet we have got obviously food miles, we have got climate change impinging on the way in which our food supply operates. How much public resistance would there be if choice was to be more limiting? Is that something you have looked at?

**Mr Jarvis:** It has come up in previous work. I think the reality is that when you step into a supermarket there is clearly a vast range of choice, but it is already, at that point, still being edited by somebody on the basis of the selection of parameters of price and quality, and so forth. We have seen over the last few years an extension of choice, environmental factors having a bigger part, a more explicit part, in that choice editing which happens, often without us noticing. Environmental, ethical, animal welfare and other parameters are being used to screen what is put in front of us. I suspect that as, for example, climate change policy works its way through, this will happen increasingly but without the consumer necessarily being conscious of it. If I am running a

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4 February 2009 Mr Andrew Jarvis and Ms Kate Bailey

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food company and I cut our carbon footprint by making my factories more efficient, the product on the shelf may be the same, the consumer may be none the wiser, but the food chain has got a little bit more eco-efficient. I am not sure that my son's selection of varieties of crisp flavour is necessarily going to be constrained by a lot of these key drivers for change that we are looking at at the moment! Clearly, there is an influence within product groups but the broad proposition is also what are people's diets going to look like? Is there a proposition here of a more sustainable healthy diet, and what does that look like? That is really quite key.

**Q112 Miss McIntosh:** You say in paragraph 4 of your submission that in fact the UK's food is supplied from a variety of sources which helps diversify risk. Hilary Benn said that the best way for the UK to ensure its food security is through a mixture of UK production and trade. What do you believe is the best balance between these two, home produced food and imported?

**Ms Bailey:** That is a difficult one, is it not?

**Mr Jarvis:** It is a tricky one and I am not sure it can be sensibly answered, not at least in the level of "food". If you look at existing patterns of production and trade, they vary enormously by commodity and then within commodity. I think we should think very carefully before we start setting production targets for oranges or potatoes, or anything else we might choose to set. A far more productive way forward seems to be to make sure that we are focusing on this transformation, making sure that our domestic sector is competitive and productive in the total sense, and what will follow will follow.

**Q113 Miss McIntosh:** In terms of self-sufficiency, we reached a peak of between 60 and 70% in the eighties and we are now about 60% self-sufficient. Are you convinced overall that we are as self-sufficient as we could be and should we become purely self-sufficient in those goods that we grow?

**Mr Jarvis:** The reference point there was perhaps the most extreme point of the particular set of incentives under the Common Agricultural Policy. So there are costs and benefits to any of these targets and our experience over the last 10 to 15 years suggests that producing a lot domestically does not necessarily insulate you from vulnerability. We have had problems with animal health in this country. It has been our access to supplies elsewhere that has kept food on people's tables at affordable prices. So I am quite passionate about the fact that food security is a derived indicator of a bunch of other things rather than something one should be discerning in its own right, because there is a very real risk of a large number of unintended consequences, both economic and environmental. The reason why we moved on from the policies of the 1980s is because of all the economic, environmental and perhaps social issues that went with that.

**Q114 Miss McIntosh:** Could I put it another way? We used to be a sort of net exporter of food, is that correct?

**Mr Jarvis:** I am trying to think through the statistics I remember. I am not sure I can answer that with confidence.

**Q115 Miss McIntosh:** If you have the statistics which will prove that and if we are no longer a net exporter, I wonder whether we should have cause to be concerned? If you have the figures, that would be helpful.

**Mr Jarvis:** But again, of what? If one picks those apart, if it is about grain, I think it may well be true but people eat more than that, aspire to eat more than that. The fruit and the vegetables and everything else, the meat and the protein which is on the table also matters.

**Q116 Chairman:** I think what Anne is driving at is that when you look at the literature there are some people, for example, who are saying, "We produce a very small percentage of the fruit we eat in this country, excluding the argument about tropical fruits which we cannot produce. Should we be doing more on that?" When you were answering earlier, it is a question of sorting out the balance between do you set out your stall to secure your food supply by being brilliant traders in the world and knowing that if one supply line gets cut off you immediately have got something else, or do you respond to the feeling by indigenous producers that a great opportunity now presents to do more for ourselves, and if we are looking at risk which is the one you ought to put your money on?

**Ms Bailey:** I do not think it is either/or, I think you have to look at both. We are part of the global situation, we are a trading nation, so yes, we should be trading. We should be encouraging an open market and we should be exporting and importing as necessary. On the other hand, we need to make sure we have got a productive, sustainable, thriving agricultural sector which is competitive and is able to compete in that global market and support that trading opportunity, but it is not an either/or.

**Q117 Chairman:** But where is the comfort zone? In other words, Anne has identified some numbers of percentage production. Have we let it go a little bit too low, or should we do a little bit more, because you could increase production but if demand goes up, the percentage stays the same? Where is the comfort zone? Where can we feel that we have got the balance right?

**Ms Bailey:** I think it is misleading to look at self-sufficiency at the top level. This is what Andrew has been saying. I think you have to look at it sector by sector, even commodity by commodity.

**Q118 Miss McIntosh:** Earlier you mentioned about the trading arrangements. What would you most like to get out of the trading arrangements? Where should we be looking to get the most out of them,



4 February 2009 Mr Andrew Jarvis and Ms Kate Bailey

and what are the challenges we face to deliver the most out of the trading arrangements? Do you fear any protectionism around the corner?

**Ms Bailey:** I will answer the last bit about protectionism. I think one thing that came out of the research is that stakeholders do have some nervousness, particularly in light of last year's food price rises and the last couple of years, where we have seen more protectionist behaviour globally. So there is a feeling that while we should encourage and move towards more open markets, we should not 100% rely on those. We have to accept that at some points there may be some restrictions in those global markets either due to some crisis event or climate change, or to more protectionist behaviours in response to food shortages.

**Mr Jarvis:** In the case of the fish sector, when I was looking at the trade figures sometime last year, the example of fish, the UK is a net importer of fish. We buy lots and lots of things like haddock and cod, principally from Norway and Iceland, who manage their stocks rather well and have got more stocks in their seas than we have access to in ours. Meanwhile, we are exporting things like nephrops and shellfish to other places, principally Europe. Clearly we can do more to improve the welfare and the health of our domestic stocks, but that seems to me a reasonable trading system where different parties are benefiting and it is not obvious that we are, notwithstanding the state of our domestic stocks in some areas, losing out over it. How one would change it is not entirely clear. As you work through sector by sector these sorts of things start to reveal themselves. Going back and perhaps approaching this proposition from a different perspective, one of the most important powerful trends, I think, at the moment is the popular interest in food and the interest in where it is coming from, how it is produced, what it does to us, et cetera. What we are seeing through that is a greater interest, in particular in British food, and I think in the long-term the connectivity of British producers to their consumers, their proposition, their understanding of that market, is going to be really key to sustain profit.

**Q119 Miss McIntosh:** Would you be concerned if countries make bilateral agreements to lease land in other countries which could distort the UK free access to world markets?

**Mr Jarvis:** It is interesting you ask that because it is a specific area which we would like to do more work on. There has been a set of countries, principally in the Gulf and East Asia, who are best known for this and their deals have had the most coverage over the last few months. I do not think it has been looked at in a great deal of detail. Many of the areas where these investments are going are places where agricultural productivity has historically been very poor and the sorts of places where we spend a lot of time in other parts of government saying, "We ought to be investing here and helping them increase output." These are not, many of them, places which are participating in the global market at the moment either. So in a sense whether this is taking land which would otherwise be supplying the poor or is actually

increasing agricultural supplies is not at all clear at the moment. More needs to be done. There are other deals which are perhaps taking pieces out of the global pie. It needs more work.

**Q120 Miss McIntosh:** I think you mentioned briefly earlier, Kate, the possibility of food shortages, shortages of certain foodstuffs? If that was the case, what is the risk of global food trading arrangements breaking down and how would you seek to overcome that?

**Ms Bailey:** I think there is always going to be a risk. You have to look at last year, where we had 40 countries who were putting some form of export ban, restrictions in place, which has to be a signal that if we see the same thing happening in the next few years, if we see more tightening in the food markets then there is the possibility, and there is always a risk, that that will happen again. Obviously, this is a global issue so there are mechanisms through the WTO and the EU in order to try and work towards that not happening, but I think we have to take more of a pragmatic approach and recognise that there is a possibility that it could happen again.

**Mr Jarvis:** The supplementary there is that we are part of the single European market for food. Were we not, we might look at some of those questions in a different way.

**Q121 Miss McIntosh:** Though in fact all of the negotiations are done at EU level, so we do not have bilateral negotiations within these international –

**Mr Jarvis:** There is that, but from memory when I last ran the numbers about 70% of our food imports, by value rather than by tonnes, came from either the European Union or the European economic area countries. We are in a very different position than some of those Gulf countries, who might be much more reliant on the global market.

**Q122 Paddy Tipping:** There is a proposition that we have got to increase our food production by 50% by 2030 and double it by 2050. That is going to have some environmental impacts, is it not? How can you square that?

**Mr Jarvis:** There is a global contextual point, and then I think we can look at what it means in the UK. I think the general view is that a large part of the solution to the global problem is realising the latent potential which exists in large parts of the developing world to raise food output. There are a billion or so people now who are going hungry, in parts of the world mostly where food productivity, agricultural productivity, is not high. That said, when we look at our domestic system we see examples every day of improvements in eco-efficiency of production, either a given yield being delivered with lower inputs or less being wasted in the chain. I saw a statistic the other day that the energy use in UK agriculture is down 30% since 1985. Production has dropped off a bit, but embedded within that is more sophisticated technologies and understanding of how to use fertilizer cost-effectively and those drivers will remain, I think. If you look at the data on waste in

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4 February 2009 Mr Andrew Jarvis and Ms Kate Bailey

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the food chain and think of the embedded impacts in those. I was talking to supermarkets who are looking now at their dairy supply chains and finding a very wide variation in terms of, for example, carbon footprint. What they have told me is that the lowest carbon footprint often comes from the best performing farms. They are just really well run business operations. They are getting high yields. If you do the maths, that works out at low carbon per litre of milk, so it takes us back to that performance curve, changing the shape of the curve, improving the average performance at any point at one time and then keeping the curve moving forward through bringing forth these technologies and the systems as well, more sustainable systems will improve output.

**Q123 Paddy Tipping:** I regularly get correspondence from and have discussions with people who say, “What we want is a kinder, gentler way of agriculture, particularly in the livestock sector,” and there are some who will argue that organics are not as productive as these fertilizers. Those are real issues, are they not?

**Ms Bailey:** Yes. We did pick up the tensions through the research as to the different views of how agriculture should meet these challenges and we had quite a polarized debate, I would say, in two dimensions, one technology, the application of science, and you have got GM in that versus not using GM, and then you have the intensive models versus the organic models. Probably the answer lies in a mixture of all of those things and I think what we are saying in the report is that this is where perhaps Defra can help, obviously not globally but in the UK, to try and help to start bringing together some of these different visions of where agriculture should go in the future, obviously backed up with research. It has to be based on science. What are the best methods to ensure that we can make agriculture more sustainable? How can we start to spread that best practice and, as Andrew says, start to address this tale of inefficient farming in the UK. How do we get them up to speed and applying best practice?

**Q124 Paddy Tipping:** Just picking up the point Anne McIntosh was making a minute or so ago, the CAP traditionally has made subsidies for production. The move now is for payments for public good, for the environment, and that is the wrong direction, or some would argue it is the wrong direction if we want to increase production?

**Ms Bailey:** I do not think we can go back to direct support for agriculture because I am not sure that encourages the right behaviour. It is about offering the right support for agriculture, possibly on a more indirect basis. It is how can they embrace best practice, how can we use technologies which are out there, apply them and transfer them across the agricultural base in order for them to improve both productivity and sustainability. There is the question of who is going to fund that, and obviously that is public funding, but I would not say that it is a reversal, going back to the old style CAP, which is a direct production subsidy.

**Q125 Paddy Tipping:** Could I just mention soya? I think that production is growing all over the world and it is leading to the loss of a big acreage of woodland. That is not good for the environment, is it?

**Ms Bailey:** No. Obviously there are environmental consequences there, yes.

**Q126 Paddy Tipping:** How do you balance those?

**Ms Bailey:** It is not something we actually looked at in the report, I would say, but I think generally—not talking about soya here specifically—retailers, manufacturers, have got to look at their purchasing policies and it is about ensuring there are higher standards met, one of which has got to be looking at the environmental consequences of the products they are sourcing. I think there is a call for better traceability through the supply chain, a better understanding of those environmental impacts.

**Q127 Paddy Tipping:** So it is a balance?

**Ms Bailey:** There is a balance, yes.

**Q128 Chairman:** Could I just follow up something you said because you were saying a moment ago what Defra’s responsibility ought to be. When I just refreshed my memory in *Food Matters*, some of the conclusions which were reached there, I noted that, for example, in the third chapter it says, in paragraph 19: “Today a patchwork of strategies addressed different aspects of the food system and the market failures in each discrete area.” When you were trying to define what Defra ought to be doing, you yourself in your submission said, “It is time for Defra to launch a process to look at whether public investment in research, development and deployment of solutions to the challenges facing the food chain is adequate and appropriately allocated in the UK and in the European Union.” So if you have got that recommendation, we have got a patchwork. We had the chief scientist last week listing a whole range of activities he was involved with, all very worthy stuff, and you have got the Defra food advisory group, the Foods Standard Agency and you have a Cabinet Committee. How on earth do you get coherence in this so that people can know what it is they are supposed to be doing to pick up on the challenges which both of you quite clearly put forward? Is there clarity and coherence is what I am seeking to find out from you?

**Mr Jarvis:** Stepping back, the point of this report, *Food Matters*, was an attempt to address that, on the basis that these activities were happening and having the means to bring them together was helpful. There are two propositions in our submission. One is about vision and one is about the research and innovation agenda. Under this report Defra is tasked with developing a vision and strategy, which I understand they are hard at work on and it is due later this year.

**Q129 Chairman:** Is this the October 2009 much promised response to all this lot?

**Mr Jarvis:** There is a progress report on this but one of the actions in here was for Defra to test and elaborate the vision for a future system which is in

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4 February 2009 Mr Andrew Jarvis and Ms Kate Bailey

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here and behind that build the strategy. The key point we made in our submission was about the research agenda and this issue of what systems we need, understanding whether we are investing enough here in the UK and in the European Union in developing systems and the specific technologies to meet these longer term challenges. There are things in here which will help with that in terms of joining up research here in the UK, but in terms of the flow of these discussions and debates the research one feels like the next on the agenda really. There is a global debate, which is also now starting to take hold, and our proposition is that there perhaps needs to be more of a debate in the UK and in the EU about those questions, about the investment in R&D, how much it is, where it goes and how much public investment there needs to be, and then some of the downstream stuff as well.

**Q130 David Lepper:** In your report you talk about the role of consumers and the involvement of consumers in debates about food policy. I think we have all become used to the Government telling us about healthy eating, indeed some of us here might have been at the debate at lunchtime about salt in our diet and now almost regular occurrences of that kind happen here in the House of Commons, but should the Government be doing more to advise people about what to eat on grounds of sustainability, and if so should it be Defra that has a responsibility to play a role in that? After all, David Taylor remarked earlier that Defra's role seems to end at the farm gate.

**Mr Jarvis:** I am not sure Defra would agree with that. Our view is that there is going to be a growing demand from consumers for advice from trusted sources which helps them navigate through what is a horrendously complex evidence base. Every day they open the paper and something else is good/bad for the environment, for the health, et cetera. We are more used to seeing that in the area of health and the most trusted agent for the delivery of that from the public side is the Food Standards Agency and it has websites and other things which are used and emerge well from public surveys.

**Q131 David Lepper:** Yet even there there are debates about how that kind of information should be provided, with the Food Standards Agency with one set of indicators and some retailers promoting another?

**Mr Jarvis:** Yes. There are also the delivery mechanisms, the format and the labels, and so forth. But I think we see the future being about that sort of trusted advice being available to serve people's questions about sustainability as well as health. It goes back to this proposition of what a healthy sustainable diet is. How do I trade these things off? The environmental evidence is developing quite quickly. It has come a long way over the last couple of years. It is often quite hard to sort the wheat from the chaff. You can get conflicts or tensions between

the environmental and health debate. You will be familiar with the fish example. Nutritionists will advise you to eat more fish. Environmentalists would dearly wish that you did not because there are not very many of them in the sea. That specific item is actually where the FSA has been working with Defra and others to try and provide some joined-up advice. I believe they have a consultation out on this at the moment. This report tasked them with extending that effort more broadly in doing that, so that means they are working with Defra to help deliver that.

**Q132 David Lepper:** What about the retailers in this debate, because again if we go back to the healthy eating issue, retailers are very keen now to tell us about the different ways in which they claim what they are selling is good for us. What role have they to play in this debate?

**Ms Bailey:** Retail is very significant, obviously, because of the power they exert over the food supply chain and if the retailers wanted to drive this proactively through the chain then it would happen. So they are a very important part of this. I think what we said in the report is that it has to be a push and a pull type scenario. There will be an element of helping and engaging with the consumer and giving them the necessary information, as Andrew said, to make informed choices but also on the other side it is about the supply chain editing out products which are blatantly unsustainable or trying, where they can, to reduce the impacts of products. It has to be that dual attack to actually start to make changes.

**Q133 David Lepper:** In general, although not entirely, consumers expect, perhaps, to pay a bit more for more sustainable food. Should they have to pay more for more sustainable food?

**Mr Jarvis:** I think part of what Kate's report sets out is the observation that as these various environmental impacts are addressed, as the external costs which are not factored into the price of food are gradually, through policy, factored in, you will start to get more of the effect of the playing field being levelled. So to the extent that cheap food is cheap because there are costs which are being borne elsewhere in the planet or elsewhere in our domestic environment, that will inevitably come up and the balance will be levelled out a little bit.

**Q134 Mr Williams:** You have told us that the UK will make a relatively modest contribution to the world demand for food by 2050 but you say that probably UK's indirect contribution will be greater. Perhaps you could tell us something about that in terms of technology transfer and other issues where the contribution may be more substantial?

**Mr Jarvis:** Yes. I think our view here was simply that the UK continues to play a very active role in the international institutions and in the international debates which are relevant to this topic. It is to the

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4 February 2009 Mr Andrew Jarvis and Ms Kate Bailey

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forefront of the international debate about climate change, to take one instance. It has an influencing, shaping and enabling role in these debates which is relevant to this topic and can be brought to bear. The UK has an outstanding science base, creating global public goods, knowledge that is used everywhere, and our view is that in a sense one could run the numbers and come up with 1% and be slightly depressed, but the fact is that there is a great deal more that we can do to contribute our know-how through these various channels.

**Q135 Mr Williams:** In your May 2008 paper you set out four scenarios of how these issues could pan out. One is the blip, one is food inflation, one is into a new era and the other is food crisis. Which scenario do you consider to be the most likely, and do you have a joint view on that or an individual view?

**Ms Bailey:** We do get asked that quite a lot, which one we think is the most likely. We did not actually subscribe probabilities to the scenarios because it was not about predicting the future, because you can usually guarantee that if you placed it at anything it would be something completely different. It was about just thinking through the range of possibilities to help companies, and hopefully Government, when they are looking at setting strategy that they are encompassing these wider possibilities. I would say that it looks a little bit like we are in “Just a Blip” slightly at this moment in time, but that those global food matters are still there, the potential to create tightening of food markets is still there, so we could end up in any of those other scenarios or all three as we go forward, I am afraid.

**Mr Jarvis:** Yes. I think the key things in conversations I have been part of in the last six months is the uncertainty and the volatility, so we do not know. I have had very learned people tell me the oil crisis will be up here within five years or down there in the basement.

**Q136 Chairman:** Just to follow that line of thinking, finally, one of the things which is absent from a lot of the discussion so far is any kind of quantitative assessment of risk factors. Everybody is very good at

painting the scenario, but when you actually break it down and say, “Well, okay, in odds-on events occurring what’s our cockshy of these various events within all these scenarios happening?”—because if you do not have some idea of risk, you cannot then plan to have the appropriate contingency in place. I just wondered if there is any work going on to try and get us a better handle on risks?

**Ms Bailey:** I would like to turn it the other way and talk about vulnerability because I think it is about a better understanding of the system itself, how it actually operates and where there are points of vulnerabilities.

**Q137 Chairman:** Whose job is it to do that?

**Ms Bailey:** What came back strongly from the stakeholders is that Government is a lead on this but it cannot do it on its own, it needs a lot of support from the private sector to do this. But there is a feeling that it is work which does need to be carried out, led by Government.

**Q138 Chairman:** To pull it down to its basics, when you look at the great businesses, Tesco, Heinz, Northern Foods, Unilever, all the people who run those must wake up occasionally in the night and worry about something. Do you sense that they are willing to share those worries with Government in terms of helping Government to then develop appropriate policy responses, because those are the factors which could affect the ability of their food businesses to continue to function “normally”?

**Ms Bailey:** Obviously I cannot speak on behalf of them, but we did get the sense that they were willing to sit down with Government and share some of that information, because there is a feeling that while of course they put in place their own contingency planning, which is really key for them, but they were also feeling that there are certain elements which can only be addressed by working together with Government. So we did get a sense that they were willing to sit down and talk.

**Chairman:** Good. Thank you very much indeed for your contribution, both orally and in written form and your definition of food security is eagerly awaited. Thank you very much.

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**Supplementary memorandum submitted by Chatham House (SFS 66a)**

*“Do you think the political cycle is compatible with the nature of the long-term work which will have to be undertaken if collectively the United Kingdom and its partners in the world are actually to ultimately achieve the objectives set by those two benchmark targets?”*

The political challenges ahead lie less in supporting the technical work on boosting yields hinted at by the question than in the wider transformation of the food system that is needed over the same period, and in particular the impact of that on consumers, their diets and the price of food.

The patterns of demand for food, and the associated environmental, health and other impacts are determined ultimately by individuals’ consumption choices. As diets shift there are consequential impacts on overall demand for grain, for land, on output of greenhouse gases, etc. Some foods seem to lead to consistently higher impacts than others. Price, access and affordability matter and will shape consumption trends, but so too will aspirations and food culture. For example, is excess consumption and overt wastage of food associated with higher, or lower, social status?

The array of cultural attitudes, behavioural norms and personal values associated with food are less easily mediated, and are far more difficult political territory, than the techno-centric innovation systems that we may look to for the next generation of higher yield, lower impact foods. What and who will catalyse a global shift towards healthier and more sustainable diets? Under what conditions will consumers accept application of novel technologies to their food in the future? By what processes are these social choices made?

To the extent that the domestic political cycle can introduce discontinuities in the way that governments engage with other partners in the governance of the food system, it may be a hindrance. A shared understanding of “the problem” across the political spectrum would clearly help. But there will inevitably be differences of view in how far government should be directly intervening or acting to catalyse change, whether in agriculture or in matters of individual consumer choice.

That said, it is the complexity of the governance arrangements in the food system—the distribution of powers across many layers (from local to global) and across different types of actors (private sector, public sector, NGOs, consumers)—that is the real challenge. The danger is that the division of roles and responsibilities impedes change and even leads to paralysis as each party—consumer, retailer, national government, EU, etc.—looks to another to take a lead, to decide the trade-offs and make the difficult choices.

#### FOOD SECURITY DEFINITION

The Food and Agriculture Organisation (FAO) defines food security as being “when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life”.<sup>2</sup>

This definition is generally accepted and widely used. It focuses, appropriately, on the outcomes for consumers. These outcomes require a set of (implicit) demand side conditions (such as income, mobility) and supply side conditions (such as food production capacity or functioning supply chains) to be met.

The EFRA inquiry is focused on food supply so we concentrate our discussion here on the supply side aspects of food security, though when considering aspects such as “affordability” the status of the consumer cannot be ignored.

Food security is compromised if any of the following are missing or deficient:

- availability—the provision of a sufficient volume of safe and nutritious food;
- accessibility—the physical supply mechanisms needed to facilitate the delivery of food to market;
- affordability—to which the food supply chain contributes through the competitive pricing of food; and
- resilience—the robustness of the system to shocks and longer run systemic risks and uncertainties.

As highlighted above, food security outcomes are also conditioned by the prevailing demand side conditions. So changes that reduce consumers’ economic access (e.g. joblessness) reduce household food security. In the UK the welfare system buffers these impacts; in much of the developing world no such safety-net exists. Low income food-importing countries can experience equivalent pressures on national budgets and their ability to pay. The UK runs a sizeable trade deficit in food products but is better able to finance it.

#### MANAGING FOR FOOD SECURITY

As discussed in the original Chatham House written evidence to EFRA, development of a comprehensive, forward-looking approach to UK food security requires:

- an analysis of each of the above components;
- an appraisal of the associated risks—contingent and systemic; short, medium and long term;
- determination of relevant indicators; and
- targeted risk management and mitigation strategies.

This activity will need to engage with the main food supply chains in their own right as the risks and challenges vary across cereals, horticulture, poultry, etc. But it will also need to examine the wider system, its resilience to shocks and stresses, and its long term sustainability. The inputs and drivers of change need to be mapped to identify how exposure to risk could be influenced by, for instance, changes in diet, water scarcity, climate change mitigation policies and changes in sourcing that might affect food safety.

If we are to build the resilience of the food system in the longer run, we need to improve our ability to recognize and respond to broader uncertainties inherent in the new operating environment. Wider questions such as the availability of basic resources—land, water, energy and skills—as well as increased competition for raw materials will create a different sense of what constitutes “risk”.

<sup>2</sup> FAO. *Rome Declaration on World Food Security and World Food Summit Plan of Action*. World Food Summit 13–17 November 1996, Rome.

Diversification is a core risk management strategy. In a food system context this means retaining access to genetic diversity—in crops, animals and supporting ecosystems. It means having a diversified research portfolio on new techniques and food production systems. It means retaining trading access to markets outside the UK—in the EU and beyond. And it means being alert to concentration within the supply chain that could compromise consumer interest. There is a key role for government in all these areas to secure, by setting appropriate frameworks, the public goods that markets alone will not deliver.

The appropriate level of management and policy response will range from the local to the global. The UK sources most of its food imports from within the ‘single European food market’ and is subject to the Common Fisheries Policy and Common Agricultural Policy. Policies set in Brussels are therefore at least as important as those determined domestically.

Chatham House

March 2009

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### Memorandum submitted by Rothamsted Research (SFS 15)

#### INTRODUCTION

1. Rothamsted Research (RRes) is the largest institute in the UK conducting scientific research into agriculture and the environment. The Institute employs approximately 300 scientists (45 research groups) and each year has a postgraduate student population of over 60 as well as a similar number of visiting overseas scientists. Research income in 2008–09 is *ca.* £30 million (including work at North Wyke Research which is soon to be amalgamated into RRes); BBSRC is the primary sponsor organisation now providing about 60% of the total funding through a range of different modalities. The portfolio of the Institute embraces arable and grassland production systems. Much of its research is focused on, or relevant to, food security.

2. The institute’s mission is:

*“To be recognised internationally as a primary source of first-class scientific research and new knowledge in response to stakeholder requirements for innovative policies, products and practices to enhance the economic, environmental and societal value of agricultural land.”*

3. The primary objectives of Rothamsted Research are to advance scientific knowledge and understanding to provide new opportunities for removing constraints on crop (food, forage and non-food) production by enhancing resource use efficiency (land, water, nutrients, non-renewable energy, labour etc.). Its research integrates mathematics, physics, chemistry, ecology and the crop sciences (including: genetics, pathology, entomology and soil science) to contribute predictive understanding and scientifically-sound options for the maintenance of economically and environmentally sustainable systems of production.

4. Defra is a valued customer for RRes and it sees the Department of one of its major stakeholders. However, Defra has become increasingly less influential on strategic thinking in RRes as its policies for investment in science have placed emphasis on areas outside the RRes mission. The proportion of the Institute’s research funds derived from the Department has more than halved from over 25% just five years ago. In 2002–03 the Institute received £7.1 million for research in support of Defra policy objectives; by 2008–09 the value of Defra funded work has fallen to £3.2 million.

5. This response to questions posed by the Inquiry is predicated on three straight-forward positions that the Institute holds with regard to global food security, the UK’s own agricultural production and the role that the country can and should play in advancing the capacity and capability to enhance food production.

- (i) For all the reasons summarised in the Inquiry announcement there is no doubt that there is an urgent need to scale up the quantity and nutritional quality of global food production; there are few that will now deny this. RRes has clarity of purpose in this context which we hope can be translated into government policy. Novel agricultural products and practices must be all about ensuring that wastage of water, essential nutrients and energy is kept to a minimum when we set the context as a necessity to elevate per hectare output (i.e. crop yields) and not increase the environmental footprint of agriculture. This is the truly “green” agenda for global food production that we should all embrace and one that requires clear enunciation to and acceptance by those who influence public opinion or are empowered to take public and private investment decisions. Agricultural systems that overtly set out to maximise productivity avoid the need to cultivate more land with all the feed-back effects that will occur in terms of likely elevated green house gas emissions due to: oxidation of carbon currently sequestered in soil, removal of carbon sinks and

- increases in emissions resulting from cropping practices (Glendining *et al.*, 2008). It is currently estimated that land-use change, primarily deforestation, is responsible for as much as 18% of global greenhouse gas emissions. This is not to mention likely impacts on biodiversity and water resources.
- (ii) The primary objective of land use for agriculture is the efficient conversion of solar energy into varied and valued forms of chemical energy for utilisation by mankind. This encompasses crops grown for food, fuel and fibre while some land is best used to produce forage for animals as intermediates in the energy conversion process. The energy conversion referred to above (i.e. the practice of agriculture) involves manipulation and management of the interaction between crop genotype and the environment (physical and biological). The requirement to do this consistently and predictably, year after year, also demands continuity of agro-ecosystem functions; this captures the temporal and renewable concept of sustainability. Maximising efficiency on the smallest necessary land area provides options to use non-agricultural land to achieve other objectives which should not be confounded with the requirement to produce food and other agricultural products as efficiently as possible.
  - (iii) All nations, and particularly wealthy ones in climatically advantaged regions (such as the UK), have global obligations with regard to efficient, sustainable food production and investment in enabling technology. The UK should be taking a leadership position in Europe by propagating and championing a forward looking policy which acknowledges this. Several of the UK's primary crops (e.g. wheat, oilseed, rape and potatoes) are also of great global importance; global demand is currently barely met by supply. However, the UK contribution to global production of these crops is small (less than 1%) while nevertheless providing more or less self-sufficiency. These facts, coupled with the relative wealth of the UK and its ability to access global markets (even when prices rise) go a long way to explain why primary agricultural production in the UK has been judged so unimportant by policy makers. It also explains why the public have become complacent about food availability or even hostile to the agricultural sector. RRes hopes that the UK will rapidly rediscover the importance of delivering on global obligations towards ensuring future food security where it is still world-leading and has in the past been catalytic through science and technology and its application.

#### RESPONSES TO THE SPECIFIC QUESTIONS

*How robust is the current UK food system? What are its main strengths and weaknesses?*

6. The onset of the world crisis in food security and volatility in commodity prices has brought about a rapid shift in perspectives for agriculture in the UK and the EU but movement in policy objectives has been slow. Policies in the EU over the last two decades have focussed on mechanisms of providing income to farmers for the management of land for purposes other than efficient food production. At the same time, the EU has introduced a regulatory framework surrounding agriculture that tends to impede innovation and works against elevation of productivity: for example, the proposals to remove access to valued pesticides and the difficulties surrounding field experimentation with GM crops. The changing circumstances and the need for scientific delivery that will counter the complacency and misdirected approaches of the last two decades are reflected in RRes research objectives.

7. Against this background, UK agriculture is potentially robust. In 1994 England was 75% self-sufficient in food production but this has been allowed to fall to 58% (RASE, 2008), through reduced investment (in skills and capital), a focus on practices with questionable environmental benefits and reliance on imports; this can be rectified with appropriate policies. Climate change predictions suggest that north-west Europe, including the UK, will be a key area for global food production in the mid- to late-21st century, with fewer limitations on Net Primary Production here than in other parts of the world (Baldocchi *et al.*, 2004). The UK can and should take note of this and play a lead, catalytic role in elevating world food production. We have the natural resources, skills, knowledge and motivation to do this, including research capability. However, the latter have been severely eroded. In 1970, the then Agricultural Research Council supported a comprehensive network of over 20 sector-relevant research institutes which underpinned the agricultural industry. Today BBSRC has only four remaining institutes focused on agricultural and food science; these remaining institutions are however demonstrably internationally excellent in their respective spheres of operation.

8. Fluctuation in prices of inputs (energy, fertilisers and feed) is a major contributor to the stability and security of the food production sector. Without stable, secure and sufficient locally-based primary production where safety and quality is high, there is little incentive (given labour costs) for the large food manufacturing sector to remain *in situ*. The arable sector is probably less vulnerable than livestock sectors in this context but the interconnectedness, mutual dependency and yet poor integration of primary production, manufacturing and retailing represent a genuine risk to long-term security.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

9. The UK is very well placed in terms of its natural resources, such as soils, and skilled farmers, supported by researchers and advisers. However, the average age of farmers is in the late 50s, and that of researchers and advisers with expertise in production agriculture is similar. This resource of skills and knowledge will be lost unless appropriate policies and funding for succession are rapidly introduced. For example, the recent Royal Agricultural Society of England report by its “Practice with Science Group” (RASE 2008) emphasised problems of succession in soil and water management, but the problem is much wider, embracing most areas of science informing on food production. Defra has drawn attention to this problem with regard to knowledge transfer capability in its own reviews of priorities.

10. Constraints on crop production are well understood: radiant energy for photosynthesis (dependent on latitude), temperature (dependent on latitude and altitude), water, plant nutrients (primarily nitrogen, phosphorus and potassium), pests (vertebrates and invertebrates), diseases (bacteria, viruses and fungi) and weeds (other plants). It might also be appropriate to add to this list the availability of knowledge, expertise and technology alongside the obvious requirement for enough suitable land. In broad terms, responses to the need for greater production can involve the cultivation of more land (or land-use change), the improved application of currently available knowledge (which invariably requires significant investment in capital and human resource) and the acquisition of new knowledge translated into novel products and practices (taking account of the complex interactions that often occur between key constraining factors). All this pre-supposes a policy framework and drive in the direction of elevated output. Of these options, the former is least desirable but is the usual short-term response. The latter two require positive longer-term commitment and action.

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system?*

#### *Soil quality*

11. Healthy, unpolluted soil is a pre-requisite for sustainable food production. UK soils suffer from wind and water erosion in some areas, which will cause irreversible (outside of geological time) soil loss. Compaction and thus poor root growth is also a risk, especially where large and heavy machinery is regularly used, such as in sugar beet harvesting on wet soils in winter. Physically damaged soil can be repaired but this takes time during which productivity is sub-optimal. Concern over declining organic matter levels has probably been overemphasised. The recent NERC-led Countryside Survey (<http://www.countrysidesurvey.org.uk/>) and a re-analysis of Scottish National Soil Inventory data (Prof Colin Campbell, Macaulay Institute, personal communication) contradict the conclusions of the National Soils Resources Institute (Bellamy *et al.*, 2005) that the organic matter content of most UK soils is declining. Even where organic matter levels are declining or low, this can be rectified by changing practice: the Rothamsted-developed KeySoil system (<http://www.keysoil.com/home/>) has been proven in Defra-funded work under the Catchment Sensitive Farming Scheme to enable farmers to rebuild soil organic matter levels and assess the economic value of this. Thus, generally, problems of soil quality exist but can be rectified.

12. Local soil pollution from toxic heavy metals and persistent organic pollutants (POPs) is important. Research suggests that the former reduce or even eliminate nitrogen fixing rhizobia in soils. Such irreversible problems must be avoided. Research is key to identifying such problems and providing the means of avoidance. New molecular methods are revealing the diversity and function of soil microorganisms. Such research is essential for understanding what diversity, and thus what land management practices, are needed to sustain healthy soil functions and productive agriculture.

#### *Water availability*

13. Current climate change scenarios suggest that water availability will be a critical limitation on food production in the south east of England. Research at Rothamsted and elsewhere is seeking to understand better the crop traits that can contribute greater drought tolerance in crop plants to support genetic improvement for this increasingly important characteristic. Computer models are also being used to predict drought and wider climate change impacts and appropriate land management strategies to mitigate these. For the UK’s major crops there needs to be a nationally agreed and coordinated strategy for delivering genetic improvement taking account of the future and traits such as water and nutrient use efficiency as well as resistance to pest and disease alongside elevated yield potential. Delivery of these objectives requires effort on the time scale of decades and a lead from the relevant government Department might be expected.

14. Crop modelling work (funded by Defra) (Semenov, 2008) indicates that unpredictable and increasingly frequent extreme temperature events are likely to have a greater impact than water deficits on the future ability to sustain predictably high wheat yields in the UK. This suggests high temperature tolerance of an important target in crop genetic improvement programmes.



*The science base*

15. Key areas of expertise in areas of research relevant to food security, especially production agriculture, have been allowed to decline. The UK now has a mere handful of research institutes with a remit for agricultural research, including food security, compared to over 20 institutes 30 years ago. Defra funding for research in production agriculture has all but ceased and BBSRC investment is mostly in “up-stream” scientific understanding as distinct from practical application and implementation. This has resulted in a crisis in succession in areas of applied research such as agronomy, soil science, weed science and plant pathology with a complete absence of expertise in some areas. At the same time, the number of people in UK institutions with direct experience of the needs from agricultural sciences in the developing world is also very few. This makes it increasingly hard for the UK to make practical impact from its otherwise strong bioscience base. The science base needs to be reconfigured and reconstructed to a considered plan if the UK is effectively to contribute to resolving the issue of food security; the *ad hoc* short term expediency of the past will not deliver a secure future.

*Provision of training*

16. The drastic decline in research institutes with expertise in agriculture and agronomy limits the provision of training. At the same time there has been a similar contraction in universities with departments of agriculture. Until very recently, the agricultural industry was not considered positively by young people as offering a fulfilled and worthwhile career. There is some evidence that the forthcoming global crisis in food sufficiency and its connectivity to other major challenges (such as climate change and environmental degradation) has again begun to arouse motivation and stimulate the interests of young minds. A marked change of policy relating to training at all levels over the next 10–20 years is necessary if the UK is to have the expertise necessary to ensure food security.

*The way in which land is farmed and managed*

17. The emphasis on delivering environmental goods and services over the last 20 years has impacted on the public perception of what land is for and greatly reduced the research base for food production (see paragraph 4). Changing the policy emphasis back towards production can be done quickly, but providing the necessary research and advisory expertise will take longer. Current advice and technical input to farmers from the supply side of the industry (including distributors) and independent advisers such as members of the Association of Independent Crop Consultants is generally good. However, a new generation of scientifically trained and technologically-aware extension specialists is needed and the former strong connectivity between the research base and practitioners in the industry needs to be built back.

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

18. Since its creation, Defra has not convincingly demonstrated real commitment to ensuring the health and well-being of the food and agricultural industries of the UK. The Department’s policies have tended to respond to other drivers relating to regulation and public perception. There is a real need to ensure sustainability of agricultural ecosystems and to reduce both non-renewable inputs and emissions. However, much emphasis has been paid to delivering more superficial and cosmetic changes of unproven environmental value. In addition, much of Defra’s focus has been on elucidating the ecological and environmental impacts of agriculture; studies on how ecological processes impact on the productivity of agricultural system should now receive much more emphasis. Actions designed to rebuild the research base and target increased agricultural productivity are needed. Tangible action on the ground and in the form of a radically changed policy environment is needed rather than more reviews, committees and workshops. Defra has to accept shared responsibility with others such as BBSRC and the HE sector for maintaining the research base as the Costigan (2006) report recommended.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

19. Defra does appear to engage well on food policy and regulatory issues but rarely appears to lead, particularly with regard to food production. Effective dialogue with BBSRC and NERC needs to be re-established so that a coherent policy on food security, with agreed responsibilities for supporting key expertise and long-term strategically important projects can be established.

20. Defra is much less well provided internally with relevant expertise in, for example, agricultural sciences. In the past, MAFF had substantial numbers of officials who had direct personal experience of the conduct of scientific research; it would be interesting to ask the question about how many Defra officials, who are engaged on the administration of research funding, have actually had a career trajectory involving

practical agricultural research. The expectation is that the number is now very low which would explain the Department's increasing use of consultants who themselves are not often well connected with the mainstream of research providers. There is a good case to be made for Defra to operate review systems for research contracting which draw on expertise in Research Councils and also to reconnect actively with the UK research base.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

21. There are plenty of key indicators of food production that Defra has investigated. RRes led a project for Defra to assess how food and fibre indicators might be used to assess soil quality: "Soil indicator robustness testing, food and fibre". This project was reviewed recently. Although focused on soil quality, four of the five robustness indicators identified could equally well be used to monitor food (and fibre) production: "Total above-ground biomass production", "Net primary production", "Area occupied by winter wheat; yield per unit area", "Yield for a number of commodities in relation to a unit of input".

22. It is always going to be hard for a government Department to ensure its policies keep pace with change and this is particularly the case in the context of the EU's dominance over agriculture and food. Events in 2007–08 showed that changes on the ground in response to markets will happen faster than policy and science can respond—although the latter, appropriately resourced, will always provide options for response. It could help if there was a better and more widely accepted definition of what is meant by sustainability when it comes to food production; it is expedient for different groups to place emphasis on different aspects. Defra (with input from others) should be able to examine critically all policies and incentives in terms of precise sustainability criteria and seek more data where this is necessary. It would then be appropriate to encourage uptake of products and practices which are compatible with movement in the required direction by modifying or reformulating policies, incentives and regulations. There are clear options for increasing production (see paragraph 9) but there will always be trade-offs (win-win is not always achievable) and little can be achieved without appropriately directed investment. In the UK it should be possible, relatively easily, with the right incentives to increase output by 50%. Beyond this is likely to require major planning and investments relating use of land and natural resources, application of new technologies and detailed consideration about how the whole food chain is integrated and managed.

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#### Memorandum submitted by Warwick HRI (SFS 53)

#### SECURING FOOD SUPPLIES UP TO 2050: THE CHALLENGES FOR THE UK.

Warwick HRI is the University of Warwick's Department of Plant and Environmental sciences; it was rated as the top agricultural research department for quality in the RAE 2008. It provides expertise in the optimisation of production, yield and quality of crops. The emphasis is on utilising genetic and genomic approaches to establish the developmental and mechanistic basis of key plant attributes and on understanding processes at the whole plant and crop system level. Contributors to the document are

Prof Brian Thomas, Plant Science, Prof Dave Pink, Crop Genetics and Breeding, Dr Rosemary Collier Crop Protection and Dr Sharon Hall, Isafruit project. Phillip Effingham, Technical and Development Director of Marshalls, a leading supplier of prepared vegetables, has also been consulted.

Prof Wyn Grant of the Politics and International Studies Department at the University of Warwick, has also contributed to this report. His general area of interest is comparative public policy with particular reference to the EU and the US.

## EXECUTIVE SUMMARY

The UK food system is fairly robust, however it is sensitive to a range of potential factors. There is a potential “conflict” between intensifying food production and environmental benefits. In order to respond to the global food production challenge UK agriculture needs to be a knowledge-based industry.

Climate change will affect food production via extreme weather events both in the UK and elsewhere. A key research priority should be to optimise the efficiency and sustainability of UK food production by providing varieties adapted to future growing conditions, including reduced water availability.

Significant wastage occurs in the food supply chain both pre- and post-harvest; much of this is driven by aesthetic quality standards, but significant losses also occur due to pests, diseases and weeds. New EU legislation will reduce the number of available pesticides and will threaten our ability to produce certain crops.

Increased energy prices will have a direct impact via fuel for farming operations and food distribution and an indirect impact via the embedded energy of inputs particularly nitrogen fertilizer. There is significant scope for large-scale automation but there is a lack of available investment to drive this forward.

The leading UK farmers and growers are innovative, entrepreneurial, well-educated, keen to engage with researchers and are ready to exploit new opportunities. However, the UK has an ageing farming population. There is an insufficient supply of knowledgeable and skilled labour, with few new entrants to the UK food industry. In recent years, the “skills gap” has been filled by migrant workers, however, this cannot be relied upon in future.

Several areas of expertise are in short supply, notably agronomy, plant pathology and weed science. Expertise is often “one-deep”. But succession planning is universally weak or non-existent, because of reduced and uncertain funding. There is a need for continuity in research funding to maintain expertise and capability. Recruitment of young career scientists is a significant challenge. Plant and Crop Sciences are not attractive to students in comparison with other areas.

Predicting future consumer habits and behaviour is never easy. However, it is likely that consumer demand for fresh produce will increase in relation to health aspirations. Currently, the UK has the largest trade deficit for fruit and vegetables and there is scope for import substitution.

Government needs to adopt a coordinated strategy across departments to meet the challenge of increasing global food production. The role for government will be determined by a choice between a sustainable food policy or a cheap food policy.

### 1. *How robust is the current UK food system? What are its main strengths and weaknesses?*

1.1 We consider the UK food system is fairly robust. Currently UK farmers produce approx 60% of all food consumed within the UK and approx 74% of foods that can be grown in the UK.<sup>3</sup> The UK has the largest trade deficit for fruit and vegetables.<sup>4</sup> Predicted trends in climate change under current UKCIP scenarios may allow the UK to produce a wider range of crops than we currently grow but may also reduce the suitability of varieties of current crops for their current locations. There is therefore a continuing need for new varieties adapted to changing UK conditions. This in turn requires research into the underlying genetics of adaptive traits (e.g. water use efficiency) to provide the knowledge and tools to breed new varieties.

1.2 Food production is sensitive to extreme weather events. In the UK, examples from recent years include floods in 2007 and 2008 and hot dry periods in 2003 and 2006. It is predicted that such episodes will become more frequent. The food industry has considerable experience in contingency planning for such events. Producers and retailers often cope with extreme events by switching to a source from a different region/country, however, this assumes that an alternative supply is available. Some extreme weather events that affect the UK also affect other European countries e.g. heatwaves, while sometimes, different extreme events occur at the same time in different food production areas e.g. flooding in Spain and adverse temperatures in the UK. Disruption of production in more than one production area can have a significant impact on supply.

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<sup>3</sup> Defra Summary of farming & food in the UK, 2008.

<sup>4</sup> Defra Food Statistics Pocketbook, 2008.

1.3 Total energy use by the UK food chain is estimated at 43 million tonnes of oil equivalent in 2006.<sup>5</sup> 2008 demonstrated the UK food systems sensitivity to energy prices. UK farming's use of energy has become more intensive with increased mechanisation. Increased energy prices have a direct impact via fuel for farming operations, food distribution and cool chain marketing and an indirect impact via the embedded energy of inputs particularly nitrogen fertilizer which for some crops represents 70% of the energy input of growing.

1.4 It is our view that the UK food system has a lack of contingency in the face of crop failures or fuel crisis. There is little storage capacity in the system, and although "just in time" logistics systems adopted by the UK retail sector bring benefits in terms of efficiency, they are potentially vulnerable to direct or indirect disruption. There is a potential vulnerability to various forms of "direct action". The effects of this could be accentuated by the "panic buying" that often sets in when consumers perceive a threat to security of supply.

1.5 There are major weaknesses in the UK food supply chain associated with human resources. It is our view that there is likely to be a shortage of knowledge and expertise in the medium term in relation to skills associated with crop production and land management (the average age of UK farmers is estimated to be well over 50<sup>6</sup>) and also in crop research and development (particularly in more applied areas such as soil science and agronomy). An insufficient supply of knowledgeable and skilled labour is also a major weakness. The demands made by retailers, tighter environmental standards and the use of non-chemical methods of pest, disease and weed control require greater technical input, particularly in horticulture, but the thin margins in the sector often do not permit sufficiently attractive pay and benefits to be offered. Stricter immigration policies restrict the availability of migrant labour, although this has had a greater impact on the horticultural sector non UK labour is now being increasingly used in arable farming.

1.6 We feel that wastage is a weakness throughout the UK food supply chain. This occurs both pre- and post- harvest. The quality requirements of retailers are often aesthetic and lead to excessive waste due to grade out of supposedly inferior (but perfectly edible) produce. Vegetable growers often grow "excess" crops to ensure continuity of supply of high quality produce. However, retailers can and do react to supply and demand and when faced with short supply will relax quality requirements. In-field waste due to weeds, pests and diseases can also lead to loss of crop quality (particularly for high value horticultural produce) but infestations also lead to significant yield losses in arable crops. Loss of yield causes reduced productivity per unit area of land and wastes resources such as fertilizers, pesticides and water.

1.7 The threat from pests and diseases may increase as a result of increased globalisation of the food supply chain. Climate change may result in increased damage caused by both endemic and exotic pests. UK farming relies on the responsible and appropriate use of pesticides in order to produce crops as efficiently as possible. New EU legislation will reduce the number of available pesticides and threatens our ability to produce certain crops. A consequence of this may be increased food imports from countries where these "withdrawn" pesticides are still used.

1.8 Replacing synthetic pesticides with alternatives requires investment in R & D to provide alternatives, including biological control agents. The EU (including the UK) has a poorer record in making biological control agents available than other states (e.g. US). One problem has been the difficulty of registration in a system designed for synthetic pesticides. The Pesticides Safety Directorate's Biopesticides Scheme has sought to overcome this. However, take up has not been as great as was hoped; one reason for this may be the existence of the "grey market" in which products are marketed without making a control claim.

## *2. How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

2.1 In order to respond to the challenge of increasing global food production there is a need to increase production per unit area as most UK land suitable for growing crops is being utilised and the need for land for other uses is increasing e.g. pressure to release peri-urban land for housing. There is a potential "conflict" between intensifying food production and environmental benefits and a key research priority should be to optimise the efficiency and sustainability of UK food production. In order to increase sustainability of production, UK farmers will need to increase yield per unit of energy input, the use of alternative energy has potential to contribute to sustainability but may also be a threat in terms of demand for land (e.g. bioenergy crops).

2.2 In general, advances due to scientific research are incremental building on existing knowledge; this requires continuity in the research base to maintain expertise and capability. In practice, a reduction in UK funding for agricultural research has resulted in a serious loss of capacity, knowledge and expertise

<sup>5</sup> Defra Food Statistics Pocketbook, 2008.

<sup>6</sup> RuSource, Spedding, 2008.

threatening the UK's ability to respond to the global challenge. This was compounded by the privatisation of the Agricultural Advisory Service (ADAS) and UK farmers are at a distinct disadvantage compared to competitors elsewhere (e.g. US) in not having the support of a national extension service.

2.3 It is our view that UK farmers will be better able to increase production by growing crops that are best suited to the UK climate. This is expected to change in response to global warming and farmers will need to respond by reviewing the varieties they grow; they will need to be supported in this by research. However, farmers are of necessity looking at short time-scale returns and do not invest in long-term R & D. Also, government funds much of its research in short timescales (3–4 yrs) with no guarantee of continuity. This has led to a loss of expertise and capacity in some areas of research, undermining the UK's own ability to respond to the challenge of increasing global food production and also to aid others to do so.

2.4 Taking account of the sustainability of long term storage of UK produce we feel that there are opportunities to contribute to meeting the global challenge through import substitution. E.g. home production of dessert apples has decreased by about 40% over the last 10 years<sup>7</sup> with a similar trend for other orchard fruit. Currently home production of apples is about 30% of total supply and of pears and plums about 15% of total supply.<sup>7</sup>

2.5 The Common Agricultural Policy (CAP) does not provide the optimal framework within which to develop UK policy. The Treaty objectives for the policy have not changed since the Treaty of Rome. The emphasis of the CAP has changed, but "Pillar 2" spending which is more relevant to sustainability has not grown as fast as was hoped. It is evident that some member states hope that undifferentiated subsidies will continue beyond 2013 rather than developing payments that are more clearly linked to specific policy objectives.

3. *In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

3.1 *Soil quality.* We agree with the findings of the report by the Royal Agricultural Society of England<sup>8</sup> that "there is a much depleted body of specialists to address the research, advisory and training issues required to support the farming community." This undermines the UK's ability to maintain the quality of UK soils in the face of the considerable challenge of increasing food production.

3.2 *Water Availability.* Water is the most important factor limiting crop production on a global scale. The UK is dependent on imported food products which contain embedded, "virtual water". These may become more at risk in the future. In the UK, water resources are increasingly under pressure due to competition from diverse users and the desire to protect the environment. Overall, UKCIP projections are for geographical and temporal changes in rainfall distribution with wetter winters, particularly in the North and drier summers, particularly in the South. The challenges are two-fold, to ensure maximum efficiency in the use of water on farm (for irrigation, drinking or cleaning of machinery) and to develop crops with higher water use efficiency to reduce irrigation requirements and for robust performance in conditions of variable water supply.

3.3 *The Science Base.* The Panel report on Agriculture from the University Research Assessment Exercise stated that the sector was responding well to key challenges relating to sustainability, climate change, mitigation and adaptation, and alternative land use. The report pointed out the importance of combining strength in the scientific disciplines with effective interdisciplinary working. Plant and Microbial Sciences form the core disciplines underpinning crop production and these are being driven forward through major advances in areas such as genome sequencing and systems biology. Much of this takes place in "model" plant species such as Arabidopsis. The challenge is to translate the fundamental information into application in crops and to develop models for traits not represented in Arabidopsis. Such "translational" research is not well catered for (other than in Research Institutes) in the current UK funding model. The recent NHF survey<sup>9</sup> confirms that several areas of expertise are in short supply, notably agronomy, plant pathology and weed science. Expertise is often "one-deep". But succession planning is universally weak or non-existent, because of reduced and uncertain funding.

Recruitment of young career scientists is a significant challenge. Plant and Crop Sciences are not attractive to students in comparison with other areas such as biomedical subjects. This is not helped by the negative representation of scientific advances in crop sciences such as GM. However, innovation, scientific understanding and application of new technologies will be essential to support UK agriculture meet future challenges. These are likely to be manifested as predictive biology using bioinformatic tools and the need to extend models from lab to field environments to create plants capable of producing robust yields in the face of changing environmental conditions.

<sup>7</sup> Defra Basic Horticultural Statistics, 2008.

<sup>8</sup> Royal Agricultural Society of England, Practice With Science Group: The current status of soil and water management in England, 2008.

<sup>9</sup> National Horticultural Forum: A review of the provision of UK horticultural R & D, 2008.

3.4 *The Provision of Training.* An important element in knowledge-based crop production is the availability of an appropriately skilled workforce. According to a recent Lantra survey the current workforce is ageing<sup>10</sup>. There are few new entrants to the UK food industry, which will face an increasing skills shortage going forward. In recent years, the “skills gap” has been taken up by migrant workers, however, this cannot be relied on in future.

The lack of students wanting to study crop and animal production has resulted in closure of many of the UK’s agricultural colleges which offered applied training and many of those that do still exist have specialised in non food areas (e.g. equine studies). Similarly the reduction in student numbers for University level education has resulted in reduction in the numbers of agriculture departments; however, those that still exist provide a high standard of training. As has already been stated Plant and Crop Sciences are not attractive to students, which results in a limited number of students with the appropriate background to carry out the underpinning research for crop production.

3.5 *The way in which land is farmed and managed.* With the dwindling numbers of industry participants, the scope for large scale automation is immense but the pace through lack of available investment is slow. To achieve the levels of growth aspired to it will be necessary to develop large scale operations that have the infrastructure to cope with transport logistics, legal compliance and modern agronomic management techniques. Environmental management will still play a major role in the process.

As previously stated (2.1) there is a potential “conflict” between increasing food production and environmental benefits and there is a challenge to balance the aspirations of different stakeholders for UK countryside. This requires a co-ordinated strategy for UK land use within which to develop appropriate policy, balancing the value of different “ecosystems services” derived from the UK countryside.

4. *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

4.1 There is a prevailing view that customer demand for fresh produce will increase as the aspirations for health and the fight against obesity gathers momentum. This is likely to take two routes which are already evident in the marketplace, either basic produce for cooking from scratch or convenience forms, e.g. pre-prepared or partially cooked for time-poor families. The split will be much clearer than current confused offers with packaging and labelling reduced and much clearer and simpler. We are unsure whether broad scale organics will survive or become niche again. This may be exacerbated by increasing focus on pesticides and their substitution.

4.2 It remains to be seen how much environmental concerns will have an impact on consumer food habits e.g. will there be a reverse of the trend from vegetables to meat associated with development and affluence? Will consumers as a whole, rather than a minority, show a preference for locally produced food, either through local markets or the existing food network and sold by multiples? Will the relaxation of EU rules on appearance and uniformity be echoed in consumer choices leading to reduced waste and more efficient land use?

5. *What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

5.1 If Government wants a sustainable food policy, it needs to ensure there is a viable production process with operators able to generate sufficient reward to continue and reinvest in its future. Under those circumstances there would not be a central role for Defra. However if Governments continue to pursue a cheap food policy then the industry (and consumers) will be fully reliant on Defra for a range of R&D support driven by strong leadership and focus. A transparent system should be in place for decisions led by evidence rather than by pressure from special interest groups.

5.2 If sustainable production is to be valued by consumers they will need a reliable way to make decisions; Government should take the lead in devising a consistent, transparent and independent form of accreditation of the sustainability of different production systems to allow consumers to make real comparisons and informed choices.

5.3 Continuity of investment in R & D is necessary to maintain the UK’s research capacity in the sciences underpinning food production. Defra is an important funder of research underpinning sustainable food production and should continue to do so. An area where Defra can provide a lead in research funding is GM where it is an appropriate approach.

5.4 In order to ensure efficient production and supply there needs to be coordination between agencies and industries throughout the food supply chain. The Government should drive these interactions. Research into modelling the complexity of production, supply and distribution chain would be useful. Models could be used to monitor and adapt a system if any indicator shows there is a problem.

<sup>10</sup> Lantra’s Business Telephone Survey, 2005 (Analysis of Current and Future Skills Needs).

6. How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?

6.1 We don't believe there is coherent Cross-Government food strategy. If there is it is lost in translation. The involvement of the Cabinet Office in the food security issue has produced a more strategic overview of the challenges and where they might be tackled. However, the composition of the Food Strategy Task Force established by the Cabinet Office shows just how many departments and agencies are involved in food related issues (eight including the Cabinet Office). Each of these departments has their own particular driver, e.g. obesity (Department of Health), safety (Food Standards Agency), competitiveness (BERR). There still needs to be a clearer understanding of what the priorities are and who should be delivering them.

7. What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?

Defra collects a range of statistics on food production, economics and land use. Key statistics should be abstracted and benchmarked against European competitors. Categories could include:

- Financial Health and viability of the food production process.
- Numbers of producers in each sector.
- Increase in National yield for key crops.
- Key R&D milestones and R&D spend.
- Environmental Balance Sheets.
- Food quality performance.
- Workforce numbers age and qualifications.

January 2009

*Witnesses:* **Professor Ian Crute** (Director) and **Mr Bill Clark**, Rothamsted Research, and **Professor Brian Thomas** and **Professor David Pink**, Warwick HRI, gave evidence.

**Q139 Chairman:** Gentlemen, having seen that you sat through the previous exchanges, I think it will give you a flavour of some of the areas of our interest. We are grateful for your interest in what we are up to. Can I formally welcome from Rothamsted Research Professor Ian Crute, the Director, and Mr Bill Clark, and from Warwick HRI, Professor David Pink and Professor Brian Thomas. I remember with pleasure visiting HRI Wellesbourne some years ago. I think when I was a minister I opened a new refrigerator complex. I hope it is still there, playing its part. I find it very fascinating and I remember at the time I was given a little paperback book on vegetable growing, which I can still say that I use to considerable effect on my allotment! So you can see you have already played a significant part in my own horticultural experience and I may have a few questions after we finish formally taking evidence because I have still got a few challenges to talk to you about! Let us move on to our questioning. You are all in the science field and I think you will have gathered from our previous witnesses the importance which they attach to science playing its part in dealing with some of the massive problems which our growing interest in food security has given rise to, but I wonder if you might sort of confide in us if you have those occasional sleepless nights and there is something that really worries you at the back of your mind when you are thinking about the challenges of science and food security. What are the things which cause you the most worry?

**Professor Crute:** Do you want me to go first?

**Q140 Chairman:** Yes, as you looked as if you were thinking, "I know the answer to that question."

**Professor Crute:** I am not sure. For me, I think actually you were talking earlier on about the 2050 horizon over the 2030 horizon and if you think about it that actually is not all that far away in terms of scientific generations. So an individual scientist motivated to do something, or a population of scientists motivated to do something, that is like one generation, so it is actually a very, very near event. So when you are talking about climate change, which of course we have been doing a lot of, actually we talk about our children and our children's children. Actually, I think in this particular area we are going to be talking about issues which we will confront in terms of the sort of instabilities which are likely to occur in our lifetime and that actually tells me how urgent this is.

**Q141 Chairman:** I am going to ask the others to respond, but you have given me a very interesting answer because it goes back to the question I was asking earlier about how you deal with the short term, because from my limited exposure to the world you operate in you have to have, if you like, a combination between some long-term funding and some short-term juggling on contract activities. I just concern myself, when you talk about climate change, the long-term nature of the work with the short-term almost bitty funding streams which you have to cope with. Have we got the relationship between the length of time it takes to deal with these big scientific issues right in relation to the funding streams to sustain that kind of work?

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4 February 2009 Professor Ian Crute, Mr Bill Clark, Professor Brian Thomas and Professor David Pink

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**Professor Crute:** I do not think it has ever been different that science has been funded on, you might say, bursts of funding. Every scientific organisation, certainly for as long back as you can think, has been reviewed on a sort of four or five yearly basis. Grants have been given on three, four, five years. I think what is different is the fact that we have actually got ourselves in recent times, perhaps the last 15 to 20 years, certainly the last 15 years, a bit addicted to the notion that actually what science is trying to deliver is like a gold medal at the Olympics. It is actually hitting some sort of high profile paper and therefore actually those are the sorts of motivations. I think we have got to return to the notion that actually we are talking about a long-term challenge. It is a coordinated approach which is going to involve a lot of people against some targets which need to be clarified and therefore actually, although the funding side of things has obviously got to be secure, it is not the staccato bit of the funding, it is actually the long-term vision and the notion that actually we are talking about long-term goals with some very clear outcomes as distinct from just simply some rather, let us call it emblematic discoveries.

**Q142 Chairman:** Now, Professor Pink, you have had plenty of time to think of the answer!

**Professor Pink:** I guess my concern would be—and I think it was referred to by the previous witnesses—that we do have a very good science base in this country and I would say that our science bases tend to move very much more away from applied science, and I think that is one of the problems we have got and the fact that we have had an erosion of applied scientists who can translate the results of scientific research into practical outputs which can then be used on farms by farmers and growers. We have lost or there has been an erosion of certain sectors of our science base, agronomists and people like that. I think you can see that in some of the statistics. If you look at the National Institute of Agricultural Botany variety trials for things like oilseed rape, the yields in those trials are going up. So the genetics is being improved but the national yield in the UK is flatlining, so we are not making use of the improved genetics. You can carry out research but if you have not got those translational skills to get it out to the practical output, there is a blockage in the pipeline there and that is something which is going to need to be addressed for science to be able to answer some of the problems in practical terms.

**Mr Clark:** That is exactly the point I was going to make. I am one of these strange people that Dave was just referring to.

**Q143 Chairman:** You are quite normal to me, actually!

**Mr Clark:** If I give you a little bit of the background of why I am where I am. I used to work for Defra many years ago and then I was working for ADAS, which is the Government advisory service, so I was one of these people who was taking research from Rothamsted and other research centres, translating it into practical use and delivering it to farmers and advisers and the general industry. I left ADAS just

under two years ago to join Rothamsted because I could see—and this is what I wake up at night worried about—this great world-class science going on in research centres in the UK which has impacts all around the world, world-class science, but when I was sitting here I just wrote down, “It is world-class science on the shelf” because people are doing this research and they are doing fantastic research, publishing it and it is going on shelves. It is a bit like us. If we were the agricultural industry and we had a group of researchers sitting down in the foyer doing fantastic research, how are we supposed to know what they are doing? That is part of the role I am hoping to play in my new role, to try and get this translation of research, and it is that joining up which is difficult. That is the most difficult challenge I think we face, because we have all these problems which we can identify and there are solutions to some of them but they are just hidden away.

**Professor Thomas:** To start with the sleepless nights, I have been having sleepless nights for a few years and I guess the thing that has concerned me is that maybe five years ago I used to give lots of talks to the general public really about GM. I used to preface it with the sorts of things we are talking about now, population pressures, pressures on land, pressures on the environment, the move in the developing countries from vegetable to meat-based diets. We have had real challenges and for quite a long time that seemed to be a message which really had not penetrated anywhere. If we looked at the priorities for research activities in this country, it was very much about protecting the environment and food production seemed to be a non-issue. I have to say that gave me sleepless nights because it seemed to me it was patently obvious that all the trends were going to come together and cause problems. So I am very reassured that suddenly in the last six, twelve months the interest has shifted, so I maybe have slightly less sleepless nights than I used to, but of course now I have to factor in extreme weather and the energy crisis, which again creates the demand for biofuel crops and things. There are even pressures that I was not talking about five years ago. So it is the combination of events that actually causes me sleepless nights because it is very difficult to predict how they will come together and there was an instance last year where we had the blip. With regard to the continuity of funding, I think that is clearly an issue and one of the ways historically one has got through that is to have institutions which have a particular remit. These have primarily been the research institutes. Again, it has been a concern that these seem to be almost systematically taken apart and the process always seems to have been that at one stage somebody will have a good idea and a bit of vision and say, “This is the way we need to do things. We’ll put our resources in to achieve something.” Five years later somebody else comes along who did not have that idea and who has other priorities and says, “Well, you know, that wasn’t my idea. I’ll take the resources and put them somewhere else.” I think the net result, as we have seen over the last 30 years, is that the structure of, if you like, continuous strategic research institutes which we



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4 February 2009 Professor Ian Crute, Mr Bill Clark, Professor Brian Thomas and Professor David Pink

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had have slowly been taken apart. Recently a couple of these activities have been moved into the university sector and there I think it seems to be much more difficult to sustain continued funding. I think that is the challenge, to retain the skills and the knowledge which has gone into the university sector which previously sat in the institutes. That is a real challenge. Although the view and the objectives may be long-term, as I say, the mechanisms tend to be short-term and tend to be sidetracked if something more important comes along. Once you lose the capability, it is very difficult to get it back.

**Q144 Chairman:** Can I move, as far as Rothamsted is concerned, to ask you a specific question? Your submission talked about the need for a national strategy for delivering genetic improvements to UK major crops. I would be interested in your observations on what role you felt the Government ought to have in disseminating and, I suppose, setting the scope for such an agenda.

**Professor Crute:** Yes, I think that comment, Chairman, is to put it into context really in terms of, if you look at the sort of investment which is going in globally in the six large multinational companies which we all know, Monsanto, Bayer, BASF, Syngenta, DuPont, Dow, the sort of investment they are putting in would make national programmes and would even make the US programme or the Chinese programme in one sense begin to dwarf. So what is the UK going to do? Well, of course, the truth is with these large corporations they are first of all only interested in global markets which are able to pay and so in some sense the developing world is important because it is developing, but it is not important at this moment in time because it can't pay. But actually perhaps the more important point is that they are really only interested in the markets which are essentially for four major crops—soya, maize, cotton (not a food crop) and rice potentially—with now a growing interest in what you might call the sort of high technology, high value horticultural crops for processing, tomato crops and things of that sort. So really the point we were trying to make there in the context of a national strategy for the UK, our major crops—wheat, oilseed rape, potatoes, the forage grasses which are important in livestock production, probably also the brassica vegetables and some of the root vegetables—these are crops which are important in a maritime climate which we grow well, but actually some of those crops, particularly the cereal crops and potatoes and oilseeds are also very important crops globally. They are traded crops and therefore actually if you are looking for win, wins, there is a real potential win, win here by choosing to invest in things which are actually clearly going to be market driven in the UK and north-west Europe—I can come back to points about why I think north-west Europe is important—but which also, in terms of the underpinning science and the routes through which we will take science to practice, you are doing something which has global significance as well. So actually to an extent strategically it plays to the dilemma which I think you were talking through with the previous witnesses

about where does the UK play its role. The UK has to motivate itself from the point of view of its own industry, its own food industry, in terms of processing. We are a wheat and dairy culture and our food processors used these products, but at the same time we have an obligation globally to deliver science and the easiest way to do that is to do that from a base, hence the concept that in a way what we have done over the last 20 years is we have sort of destroyed any integrity in the systems. As Brian was referring to, we have systematically dismantled some rather well joined up working systems. Perhaps we can begin to reassemble them in a different way but against some of the nationally strategic important areas where this would actually play both to our own home advantage but also play into a global market as well.

**Q145 Lynne Jones:** Could you start off by exploring where your own institutions research funding comes from, the sources of your funding, and how that has changed in, say, the last five years and what effect any changes in funding have on the type of research you carry out. First of all, Warwick?

**Professor Thomas:** We joined Warwick University about five years ago. Previously we were quite a significant part of Horticulture Research International. At that time, probably 50% of our funding came from Defra with about 25% also from BBSRC through a core grant and the remainder, the significant amount, came from the Horticultural Development Council and then various sources of competitive grants. When we joined the university, the BBSRC gave us some continuation funding which has now finished. We have a strategic contract with Defra which runs until 2012 and that is about 50% of our funding, which is equivalent to about £5.5 million per year. We now have about £2 million from competitive BBSRC funding, but three-quarters of a million, I think, from other research councils. So we have moved to secured funding from other research councils, EPSRC and NERC. We have about three-quarters of a million pounds from the HDC, the Horticultural Development Council, so we have managed to actually sustain, in fact I think we have slightly increased the amount of funding we have got from them. Then the rest of the money comes from charities and various other small industry sources. The main change has been that we have essentially moved—also, sorry, as far as Defra funding is concerned, when we joined the University I guess Defra was still acting as a proxy industry customer and was commissioning quite a lot of research in relation to production. Over the last five years the funding has gone very much now towards environmental protection, desk studies on climate change, protecting the rural environment, biodiversity. So the amount of, if you like, practical experimental work, agronomy, that type of work has decreased. We do not have any strategic BBSRC funding so again our activities have moved very much towards basic studies, working on model systems and away from crops. So there has been a

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4 February 2009 Professor Ian Crute, Mr Bill Clark, Professor Brian Thomas and Professor David Pink

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move away. I think we have managed to compete in terms of quality to keep funding coming in, but it has certainly affected the profile of what we do.

**Q146 Lynne Jones:** So you are unusual in that your funding from Defra has been maintained, but the type of research they are funding you for is more blue skies research than translational research?

**Professor Thomas:** They fund us to do work which supports their policy development and the policy objectives have been very much about environmental protection over the last five years. Interestingly, now we are beginning to have discussions with them about changing the emphasis to improved production and adaptation to climate change, which it is related to.

**Q147 Lynne Jones:** When you are discussing your programme, say, with your funders like Defra, to what extent do your recommendations for what your priorities should be come into it, or are you just reacting to what they say they want, or do you say, “No, we think this is more important”?

**Professor Thomas:** It depends, I think, a little bit on the actual topic. Professor Pink can talk on things like genetic improvement programmes, which have continued, where we have had quite an input into suggesting ways in which that can go forward. In other areas such as, if you like, climate change mitigation, adaptation to climate change, Defra have consulted internally and decided there are areas in which they would like research work done and then they come to us and say, “Can you do something in this area?”

**Q148 Lynne Jones:** Do you think Defra are intelligent customers of research?

**Professor Thomas:** Yes, I think they are –

**Chairman:** He has got to say “Yes” otherwise it will be capped!

**Q149 Lynne Jones:** Perhaps I should ask Rothamsted. Could you respond to the same question?

**Professor Crute:** The answer is broadly similar. There are slight differences in the proportion. Rothamsted at the moment would be a business of about £26 million worth of research and at the moment about £12 million of that comes in from BBSRC, not exactly as a core grant but it sort of comes in in large chunks, essentially to sustain what you might call core competency and then about £5 million we would win in competition with the universities and other institutions. So that would mean that about 60% of our funding is coming from the research council BBSRC. I have been at Rothamsted just over ten years and when I came to the Institute I should imagine that about 30% of the funding was from Defra, maybe somewhere round about £8 million, £9 million, something of that sort. I could not give you a precise figure. Certainly by 2002/3 it was about £7 million and I have that figure firmly in my head, and in the period from 2002/3 to the present we have lost consistently around about three-quarters of a million pounds a year, so we are

now down to about £3 million. So Defra funding is now pretty much half what it was just five years ago and of course, as Professor Thomas has mentioned, the targeting is really very much, as perhaps it should be, to target Defra policy basically. If Defra policy is to do with environmental targets, then that basically is the way in which the work is targeted. I would say that the impact of this is that essentially we have become, I think, very competitive in securing funding from research councils to the extent that what I have been doing really over the last probably eight or nine years is, sadly, to be showing the door to people who to some extent were following perhaps some of the things Bill was talking about, very much in connectivity with the industry, a good dialogue with the industry but not necessarily doing research which was, if you like, striking chords with the Research Council. It was very much translational work, meeting the needs of industry. For those people effectively funding was drying up, but of course we were competing for research council funding, which means that we recruited a whole cadre of people whose motivations are for all intents and purposes to answer basic scientific questions. There is nothing wrong with that. It is probably more on the territory of the universities historically, but I think it just emphasises something which Bill was saying, that actually there is a real anxiety here now that we have a very, very thin veneer of people who really understand what I would call the needs of the industry. This goes through plant breeders, people who can do practical plant breeding, plant pathologists, people who can diagnose disease and understand the introduction of disease control systems, agronomists you can come up with and weed biologists. I can tell you that there are probably only about four weed biologists left in the UK, actually, and some of them are probably –

**Q150 Chairman:** There are plenty of weeds on my allotment, I can tell you that!

**Mr Clark:** Yes, absolutely, very important. All I am saying is that if we are talking about a risk issue—I think you referred to risk with the previous people giving evidence—one of the risk factors for the UK is that—we have invested enormously in genomics and in basic science, we have been extraordinarily successful and we still are actually, in terms of science citations, at the top of the league, despite being quite a small country with an agricultural economy which is not making a huge contribution to the GDP. We are still seen to be world players, but actually when it comes to the ability to take that science and translate it into practice, whether it is through the supply side industries of the corporations in terms of discovery of new agro-chemicals or what have you, or whether it is more at the practice end of elevating best practice in agriculture and horticulture, we have a very thin veneer of people who can do that now and this is a major risk factor.

**Q151 Lynne Jones:** Mr Clark, you explained your new role when you have been brought in. How are you funded?

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4 February 2009 Professor Ian Crute, Mr Bill Clark, Professor Brian Thomas and Professor David Pink

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**Mr Clark:** Again, it is in stark contrast because although I am officially head of a department of Rothamsted, even though my research centre is geographically removed from Rothamsted, I run a research centre which is almost, probably 95% industry funded because it is levy funded from the Home-Grown Cereals Authority, it is levy funded through the sugar beet levy. We do work for industry, for BASF, Bayer and DuPont, all the agrochemical industry. We do work for growers, but it is all applied because I am the head of the department of applied crop science. Now, that research is not funded any more by Defra and it is not liked by BBSRC. All the high science that is going on at Rothamsted—that is what the BBSRC traditionally have funded. They do not fund the applied science that I am doing, so I—

**Q152 Lynne Jones:** Does that matter if industry is doing it?

**Mr Clark:** Well, it matters because the work we do for industry, the work we do we try to have it strategically aligned with what Rothamsted's role is, but if BASF comes to us and says, "We have this wonderful new thing," whether it is a variety or a chemical, whatever, and they want us to work on it, we are essentially working for them. We are not working for UK growers, we are working for that company. They may ask us to work on GM beet. It is of no interest to British farmers. It might be very good for that company in the States. So it keeps the research going and it keeps people like me, who are translational people, who are interested in knowledge transfer and doing the research and putting it into practical use. So it maintains a pool of people, but that pool of people is dwindling because there is no Government funding, and even the levy funding is going down. So there is a danger that we are living on almost the crumbs from industry, but if we do not get support from Government that group of people who can do that type of research will be gone.

**Q153 Lynne Jones:** You have said in your submission that the science base needs to be reconfigured and reconstructed to a considered plan if the UK is effectively to contribute to resolving the issue of food security. So how should it be reconfigured and reconstructed?

**Mr Clark:** From my point of view, I think Government needs to accept that just—"just" is a terrible word—doing good science is not enough. That keeps the UK at the forefront in terms of technology and science and we can help developing countries and we can help countries outside the EU, but if you want to do science which has an impact on social and economic development within the UK you need a group of people who can do that. So you need to fund the type of research that those people will do and that type of research generally is not being funded.

**Q154 Lynne Jones:** Who should be responsible for that?

**Mr Clark:** I think it has to be a realignment of the BBSRC strategies and Defra and the Government in general.

**Q155 Lynne Jones:** So you really need a longer term horizon for Defra's input?

**Mr Clark:** Well, we do. I think at the moment, certainly in the last five, ten years, Defra's policies have not been about production and production-orientated research just was not done. As a result of that, we have lost the expertise.

**Q156 Lynne Jones:** When Defra cut its budget when it had financial difficulties and we had the minister in front of us, he basically said, "Well, it is not cut because we haven't actually started these programmes." Is this not a problem when you have a department which has got other pressures? Would it not be better if all the funding from Defra actually was put into the science base? Should Defra retain an interest in funding these kinds of projects, or should it all be under DIUS?

**Mr Clark:** I think there is a difficulty with Defra because of the rate at which their policies change and inevitably it is like the proverbial oil tanker, it takes a long time to change the direction of research. In a way we are living on past glory. To go right back to being about food security and, as David Pink mentioned earlier on, crop yields, if you draw a graph of crop yields over the last 40 years you can sit back quite comfortably. You can see yields going up and up and up. But if you change the scale and only do it for the last 20 years, you are in real trouble.

**Q157 Lynne Jones:** But you have not answered my question.

**Mr Clark:** Well, it needs funding from wherever Government can take it, whether Defra do some of it, DIUS, BBSRC. I had a meeting with one of the new directors at BBSRC, Celia Caulcott, who said all the right things. They were going to be more interested in applied research. They were not going to sort of leave it on the shelf. They were very interested in this translational research. So BBSRC are saying the right things.

**Q158 Lynne Jones:** You call for a considered plan. How is that plan going to be developed?

**Professor Crute:** I do not recognise the words, actually, that you have mentioned but nevertheless I will respond to the question. It seems to me—and it comes back to what the Chairman asked me in terms of national strategy—I am old enough to know that when I joined this sort of research activity back in the 1970s this was actually just about the time of the Rothschild Report and actually there was essentially a single primary funder and that was the Agricultural Research Council. It became the Agricultural and Food Research Council. But actually the changes which Rothschild imposed were not bad particularly. What they did was they actually said, "We actually really do want a proxy customer for this particular research because actually the way the Research Council is taking it is actually taking it in what you might call too basic a direction and the

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**4 February 2009 Professor Ian Crute, Mr Bill Clark, Professor Brian Thomas and Professor David Pink**

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industry needs something which is closer to its needs.” So actually the transference of money from the Research Council into Defra at that particular time was not a bad thing. What I would like to see is a return to a single primary funder and probably the truth is that that is probably best in the Research Council area, but I would not like to see the single primary funder actually have complete carte blanche over the way in which that funding was actually delivered. I would actually see a situation where Defra would expect to continue to be influential as an end user of that research, as a policy customer, but as an end user also because of some of the responsibilities Defra holds in a regulatory framework or in a legislative framework. I think actually the other thing that needs to happen in this context in terms of the strategy we are propounding here would be that actually the end user, not just Defra as end user, but the industry as an end user, whether the supply side industry in terms of seeds, agrichemicals, fertilizer, or the growing industry, or even perhaps the advisory sector, which of course has grown up in terms of independent crop consultants, who are also transmitting science into practice, that these end users should actually be influential over the way in which that budget for science is used. So at the moment—and I am an employee of the Research Council but I can speak boldly here—it seems to me that the way the Research Council is actually constructed is that it is constructed with, you might say, a token view of having people present who represent sectors of the industry in the case of BBSRC the pharmaceutical sector, the agriculture sector, but the dominance of the Council is actually an academic dominance, which inevitably means it is self-perpetuating the demands of science. Again, you cannot say it is a bad thing, but if we want to realign and we want to change priority, we have to talk to end users. End users have to be involved in the decision-making process and Defra is an end user and Defra needs to be involved and it would concern me greatly if Defra was in some sense just wiped away in this direction. But I do think that we have ended up—I think the Chairman made some comments earlier on about this sort of plurality of involvement that is absolutely true—we have got a whole range of government departments which have an interest in this. We have several research councils, we have some agencies of government. So there is a whole plethora of people and we need greater clarity and the joining up of this is not just a joining up between funders, it is a joining up of philosophy, actually, objectives. What is the purpose of the exercise? What are we trying to achieve? There is not actually a lot of coherent thinking in this area. I could go on, but I won't.

**Q159 Lynne Jones:** Professor Pink was nodding.

**Professor Pink:** I was going to make the same point. Defra develops the policy which UK agriculture operates in, therefore it does need to have access to research to have evidence-based policy, so I was going to make exactly the same point that Ian so eloquently made. I think it is important that Defra

does have a role in determining research, whether that funding is proxy funded through somebody else, but it should have that input.

**Q160 Lynne Jones:** It would be useful, if you have got any further thoughts about Defra, if the funding were transferred to the research councils, and also there is Merck as well, how that would actually work.

**Professor Pink:** I think that is the other important point, coherence of policies from different departments which impact. So you have the Environment Agency which will have a policy which impacts on agriculture and will have a different set of drivers. The Department of Health will have a different set of drivers and that coherence of what we actually want from our food and agriculture is lacking, I think.

**Q161 Lynne Jones:** But it does seem that the BBSRC, which itself is not responsible for funding some of the data sets and the basic knowledge, is more concerned about the loss of this area of work—and you have also raised the issue of translational work—than actually Defra is?

**Professor Crute:** Yes, I would agree with that. I think history tells us that it actually did work and it worked where actually there was money transferred notionally under Defra control but it was essentially managed by the Research Council in large tranches. I worked in that system. What we moved to in the mid-80s was a situation where this money was sort of carved up into ever increasing smaller tranches of money. It was given essentially to, I suppose you might say policy groups in government departments, who actually, with the best will in the world, were not going to be the best people to actually determine the scientific priority. So the most important thing, I think, is to say, “Yes, we have got to have some sort of a dual key on certain components of the funding but this should be allocated in largely strategic units. For example, just to take a point which will resonate with the Chairman, when I actually worked in HRI there was a largish chunk of money, for example, for vegetable disease and horticulture. So a biggish chunk of money, but nobody really worried about the fine detail of what precisely it was being spent on, but every four years somebody would come down and give it pretty good scrutiny to make sure that actually what was coming out was appropriate, and certainly it would be people in the industry who would be jumping up and down if they actually thought it was being spent on the wrong things. So I think there was a system in the past and we took it apart and it would not be difficult, I think, to put it back together again.

**Q162 Lynne Jones:** So if you were in charge of funding, what would be your priority areas for research in food and farming?

**Professor Crute:** Well, I think I have made some comments about where I think the UK can contribute—we are a small nation and we have certain things that we do well. If we are talking about agriculture and we have a sort of culture, as I say, of

bread and dairy, it would be good to be able to grow all that fresh produce rather than exploiting cheap labour in other parts of the world, et cetera. So there are things which drive it from the perspective of what we want to produce and, as I said earlier, we can drive it from the point of view of things we want to deliver to the world in terms of expertise, knowledge and what have you. But I think there are some really big questions. The first is the whole issue of renewability. We are dependent essentially for our production, if you look at the fact that we have moved in a relatively short space of time from producing four tonnes of wheat per hectare to being consistently able to produce between eight and ten tonnes. I think the national yield is around nine tonnes, something like that. That is a doubling of yield. We are looking for another doubling of yield. Well, you know, actually that is completely dependent upon, broadly speaking, non-renewable imports—nitrogen fertilizer, fungicides, herbicides, et cetera. How are we going to carry on producing ten tonnes per hectare and remove the dependence on non-renewables? So clearly genetics has got a huge part to play. Genetics is for all intents and purposes a renewable source. You take the energy from the sun and you actually optimise your genetic material. That is not going to be the only answer, but clearly we have got to put more into that. The other thing, I think, is that we really have to come forward with alternatives to the inputs of agricultural chemicals and the optimisation of nitrogen inputs, and actually the big challenge is probably a renewable source of ammonia from the Haber-Bosch process which will allow us to carry on making nitrogen fertilizer. That is not a problem on the energy side, it is where are we going to get a renewable source of hydrogen from, because you need hydrogen to make ammonia and if we can produce renewable energy and we can produce renewable hydrogen then actually nitrogen fertilizer, despite what the organic movement might say, becomes a renewable input. That is a real driver.

**Q163 Lynne Jones:** Warwick, you said in your submission that there was significant scope for large-scale automation and there was a lack of investment here. I will give you the opportunity to answer the same question as Professor Crute, but that was something you flagged up. Is that a matter for research, or where is the investment going to come from? You are looking nonplussed.

**Professor Thomas:** In putting our paper together we did have some discussion with some industry participants and this is a message which came from them, that labour was a major issue, particularly for leafy vegetables.

**Professor Pink:** Generally labour is an issue here.

**Professor Thomas:** One of the things that would have a huge impact on the industry would be the effective use of automation. However, the investment required to achieve that would be high and the industry is made up of relatively small units who themselves are probably unable to make the investment to make that happen. So that was one area.

**Q164 Lynne Jones:** Who is going to make that investment though? Would the supermarkets invest in their suppliers on the basis that they would then get cheaper supplies?

**Professor Thomas:** I think history would suggest that it would be unlikely –

**Q165 Chairman:** Is there not a paradox that you have got, because I could understand if you said to me, “Well, we’ll have a GPS driven automatic tractor that will do the ploughing, harvesting, sowing, you name it. Get rid of the driver.” So you have saved one unit of labour to do all of those. It is an enormous cost. But in those parts of the world which perhaps at this moment in time have the biggest potential to increase their productivity and production labour is not a problem and if we are going to apply our science to helping people on simpler agricultural regimes move forward at the same time as we deal with the scientific challenges of a sophisticated regime and how do you crank that up, how are you going to keep these balls in the air? Professor Crute made the point, what could we contribute locally? We are going to have to look in two directions, one, if you like, to sophisticated western activity and the other to less developed agricultural regimes?

**Professor Thomas:** That is true, yes.

**Q166 Chairman:** Can we keep both balls in the air?

**Professor Thomas:** I think if you are asking how can we contribute, I would have said yes, there are two strands and one is, if you like, the high technology, high efficiency route which in the UK would be the appropriate way to look at things, but the other way it would have a major impact, of course, is in developing countries where there is the most potential for increase, and there you are dealing with probably small farms and the type of research you need to do or the type of support you need is quite different. It is probably much more about systems, advice and extension, and allowing people to operate to their potential. Again, I think it is a twin track way of thinking. I think automation is the high-tech effective use of resources, primarily within the UK. In terms of general research, what would be the priorities, I think our views are very similar to Ian’s. Where we can make a great contribution is really in particular things like genetics of UK crops. One of the things we can exploit there is that technologies again are developing very quickly, so genome sequencing, for example, is getting faster and cheaper all the time. We can contemplate talking about our own programmes to sequence genomes of the crops we are interested in, the ones which currently do not get picked up at international levels. We have really good collections of genetic resources where there is a huge amount of potential, the use of technologies to actually define these, if you like the genetic composition of these, is important. The other area, I think, is to try and take some of the principles which are coming out of the basic studies of system biology, which is intensive modelling and testing models and seeing to what extent we can apply those to agricultural systems and the

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4 February 2009 Professor Ian Crute, Mr Bill Clark, Professor Brian Thomas and Professor David Pink

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relationship between the genetics of the crop and the performance of the system. Those are the two types of areas where I would see this –

**Q167 Lynne Jones:** Could you actually answer my question about who is going to pay for the investment in automation?

**Professor Thomas:** I think it would have to be Government.

**Q168 Lynne Jones:** The Government actually providing mechanisation for private land owners?

**Professor Pink:** It is not the mechanisation, it is the research to develop the actual machinery, the actual systems which need to be incorporated into the machinery. The actual manufacturing would then be done by industry and there used to be an engineering research institute but there is no longer.

**Q169 Lynne Jones:** So we have got to commission research in engineering?

**Professor Pink:** I think genetics is also one way where you can juggle these two things, because genetics can be used in the developing world as well as in the developed world. You should not just distinguish the sophistication. We have just appointed an agricultural economics research fellow who has just completed a research project looking at the benefits of GM crops for farmers in India and it is actually the poorest farmers who benefit the most from sowing GM crops.

**Q170 Chairman:** As long as, to take up the Rothamsted view, they can afford to buy them?

**Professor Pink:** But they can. They could afford to pay the premium for the seed. What they were not being able to do in the past was to be able to buy the pesticides. So actually having a GM cotton that would control the pest, their gaining yield was huge compared with the richer farmers who were buying some pesticide. So they also got a gain in yield but not as much. So the sophisticated genetics can actually benefit the small farmer as well. I think the other thing as well is that ideally expertise can be used for training people. So even if it is not the crop they are working on, we can train and build the capability and capacity within those developing countries to do the genetics within the country as well.

**Q171 Lynne Jones:** Is DFID funding this type of research?

**Professor Pink:** DFID does fund some research but it has recently started a joint programme between BBSRC and DFID which funded a series of projects as well. They just started last year, I think.

**Q172 David Taylor:** The first set of questions asked of the first set of witnesses related to the robustness of the food supply systems and the second core area our inquiry is looking at is how well we are placed in the United Kingdom to assist with that significant challenge of increasing food production by 50% by 2030 and then doubling it in the ensuing 20 years. Looking at your submission, for which we are very

grateful, you talked about the resource of schools and knowledge being lost unless appropriate policies are pursued—and here we are talking about farming and applied practical research, I guess. You also talked about in the science base “a crisis in succession in areas of applied research such as agronomy, soil science,” and so on, and Warwick HRI concurred, “there is likely to be a shortage of knowledge and expertise in the medium term”. Is it already five past midnight? Is this inevitable now, that we are going to see an erosion and even a disappearance of some component parts of the knowledge and skills base?

**Mr Clark:** I think it is probably a quarter to midnight, but it is getting very close. It is not too late. You may have to thank the demise of a lot of pension schemes for this, but there are a lot of pathologists, entomologists and agronomists who are now working into their sixties who in previous years would have gone. The average age of advisers and good translational researchers is over 50, so it is getting into the mid 50s.

**Q173 David Taylor:** Older than farmers?

**Mr Clark:** And farmers as well.

**Q174 David Taylor:** But older than farmers, the advisers?

**Mr Clark:** Well, and advisers. I spoke at the AICC, that is the Association of Independent Crop Consultants, so they are the independent advisers, and I stood up—and I know most of them well enough because most of them are ex-ADAS people—and I stood on the platform and I looked out and, no offence to the Chairman, there was a lot of grey in the audience! I asked the chairman what he thought the average age of the AICC members was and he said, “Well, it’s well over 50.” Now, there are a lot of young ones actually coming in, but that means there are a lot of very old ones.

**Q175 David Taylor:** So we are at a quarter to midnight then? So you do not think there necessarily is a skills gap looming in the medium term?

**Mr Clark:** Oh, there is. There is a skills gap now. Unless you do something—and where you get the money from and how you change the policy and how you encourage younger people to come into this, how you get translational research which has economic impact—it needs investment.

**Q176 David Taylor:** And it will inhibit our ability to contribute towards the expansion of food supplies?

**Mr Clark:** Oh, yes.

**Professor Crute:** Can I just make a comment? In times past at institutions, the sort that Brian was talking about earlier, the Research Council institutions, there was a significant number of people who worked in those institutions whose job it was—essentially they were seconded on a regular basis but they were home-based—to address issues of the developing world and that was because some of it was technology based. It was essentially because there was a technology base in the UK for things like virus diagnosis, things of that sort, but some of it was

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4 February 2009 Professor Ian Crute, Mr Bill Clark, Professor Brian Thomas and Professor David Pink

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actually to do with possibly altruistic approaches, but it was actually to do with influence and plantation crops, all sorts of reasons. So the motivations of today might be different from the motivations of yesterday, but actually the mechanism, which was actually to have people who were motivated for some reason to engage with the developing world from a foundation of the UK in an institution which was primarily based there because it was actually servicing the needs of our industry is actually a model which I believe we could recreate. Bill is talking obviously about the needs of our industry and I certainly concur with all of that. We do need to build back the capability to translate science into practice here, but we also need to do something different and that is, I think, harness the motivation of another generation, which I think is there to do something to address these big challenges. We can sit here talking about these challenges, but actually there are people out there who want to do something about it and we should use that motivation and bring them in and get them tooled up to do that.

**Q177 David Taylor:** Warwick talked about an insufficient supply of knowledgeable and skilled labour now, at this very moment, and you see that as a major weakness. Could you justify that and, more importantly, what would you flag up to the Government to be a way to address that? Professor Pink?

**Professor Pink:** Talking from the view of the horticultural industry, I had talks with the horticultural industry and they have great difficulty in actually recruiting graduates and skilled labour into their operations. At the moment a lot of that is filled by having migrant labour, so Poland still has a very good agricultural university system. People are coming in who have got the correct practical training to work at a supervisor level and management level as well now, so that is happening. We talked to the big horticultural plant breeding companies and they are having big difficulties recruiting young scientists who have been trained in plant breeding.

**Q178 David Taylor:** What do your HR people tell you are the reasons for this lack of attraction?

**Professor Pink:** Part of it, in fact a lot of it, is that they are not going through the university systems. The number of university courses in agriculture and supply courses has dropped because the students are not there. Universities are running a business. If the customers are not there, they are not there. One of the problems is, though, that students look at these sorts of courses and think, "Where's the career?" With the privatisation of ADAS there are not the career structures. People can go and join private consultants, but there is not the clear career structure that there used to be.

**Q179 David Taylor:** It sounds as if you are saying we are all doomed?

**Professor Pink:** No, I don't think we are doomed, because I also agree –

**Q180 David Taylor:** It is a quarter to midnight?

**Professor Pink:** It is a quarter to. I think one of the problems we do have as well is that in the past, again going back to the dim, distant past, MAFF (as it then was) used to fund PhD studentships, which could be more applied PhD studentships now. Our PhD studentships now are largely funded by research councils and there is an internal competition for them and they have tended to move to more pure science types of PhDs as well. So there is not the training mechanism there for young people to come through. The levy boards do fund a small number of PhD studentships which could be more applied, but there is not the funding stream for that sort of training at a postgraduate level.

**Professor Thomas:** The other component is the amount of research funding available, so again with university departments, as research funding has decreased, the number of departments which offer agriculture courses is decreasing. If you look at the recent RAE round, I think there were 15 submissions under agriculture, two of which are actually institutes, or primarily institutes, so that was 13 and that compared with 17 in the previous submission. Some of the new ones are very small, like Lincoln and the University of the West of England. So gradually the research sector is getting smaller. The amount of courses is smaller. It is an area which is not so exciting to students. They would get very excited by biomedical and students with ability will tend to go that way. I think there is this general, if you like, image of agriculture and agricultural research which is not, I think, presented terribly positively and it is not very motivating. So I think we need to get agriculture and agriculture research, food production, up the agenda, seen as much more of a positive thing.

**Q181 David Taylor:** If you re-balance the research funding available into applied research, will that not have a serious effect on what you might call blue skies research? What will happen there? Will that disappear in its entirety for the short term?

**Professor Thomas:** Again, I think it is a balance. I think you can do high quality translational research. Ian's idea of having central funding, I think that is okay, but that funder will have to have as its remit to support agriculture through research, not as one component where you immediately get into competition with biomedical and other kinds of areas. Really somebody needs to have that responsibility, that remit to say, "We are going to move the knowledge system forward in relation to agriculture."

**Q182 David Taylor:** All four of you are to an extent agonising about the ability of your sector of research really to attract good numbers of students. You have said that not enough students are coming into the university system. To go back upstream, what should Government and in particular perhaps the Department of Children, Schools and Families, together with others, be doing to alter impressions to encourage a desire from a younger age for able students to move into your sector of society?

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4 February 2009 Professor Ian Crute, Mr Bill Clark, Professor Brian Thomas and Professor David Pink

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**Professor Crute:** I am not quite as gloomy as perhaps Brian on this one. I actually think that certainly people of my generation were drawn into this area because of things like the green revolution and the inspiration that that provided. I think what has happened over the last 18 months or so, particularly the whole discussion about natural resource management, climate change, has actually brought people who have got an interest in, let us call it the natural world and environment. It has actually brought young people, I think, into this. What I think we have to do is take the opportunity of capturing that. Capture it now.

**Q183 David Taylor:** Those people who can see the potential of plants and –

**Professor Crute:** Absolutely, capture it now. Here is not the right time to discuss it, but Bill and I are working on the beginning of projects which we think, through the Regional Development Agencies, ought to be funded to actually begin to up-skill in certain areas, to try and build back some of these applied skills. But I think at the more research end we do see evidence of younger people who want to get involved with what you can call these grand challenges. The issue, I think, is the fact that we talk about where we are relative to midnight. This is actually a ten year project to build back in the UK the sort of levels of competency and the critical mass. It is going to be a ten year project and probably we have, I think, about a couple of years of, let us call it the existing expertise available to, if you like, take the next generation and actually build the succession. I think if we don't do it in the next couple of years then actually we are going to be importing—there is nothing wrong with it, but we will be importing people from China and Poland, and what have you. There is nothing wrong with that, but I think we will not necessarily be building it on the back of our own institutions. We will be buying it in.

**Q184 David Taylor:** You are seeing what you might call the first green shoots of a renewed interest amongst young potential researchers?

**Professor Crute:** Because it has become an exciting and challenging area. When people tell you that there is enough food in the world and that everybody is complacent, why would you want to go into it?

**Mr Clark:** I think there is a degree of fashion as well in what is happening. I came through the same thing as Ian. The green revolution excited me. Children now are excited by GM crops. They are excited about food and security. But at my centre we have school visits, we have A-level students who come and do job experience with us, and the kids who come are fascinated by the science we show them, but when they look at where the research jobs are, it is all molecular biology and it is all genomics, and they have to do that. If you want to be an applied scientist, it is very difficult to see where you are going to go, so they get sucked into a system. The agricultural college I went to and the university I went to, they have changed their courses. They are not applied any more, they have gone down the environment route because that is what people

wanted to do work on and that's where the jobs were. If you were a molecular biologist or an environmental scientist, you would get a job. So it goes right through the system. The kids are interested, but they will go down where they see a future. So it is up to us to try and create a possible future for these people who are excited by the science.

**David Taylor:** So you think they will buy a ticket to sing about feeding the world, but when the actual detail of what they might have to do becomes clear the job may become less attractive!

**Q185 Chairman:** Let me just build out from that because one of the things which causes me a bit of concern from what you are saying is that if we do not crack the skills issue you have made some statements, I think the one I looked at was in Rothamsted, Professor Crute's evidence, where he says, "... it should be possible, relatively easily, with the right incentives to increase output by 50%." That is why I started off by saying you are in a long-term business and if you have not got the right skills mix that "easily" seems to be in doubt. I think it might just be quite useful for the Committee to know what are the headline technical scientific issues you have got to crack if we are to be able to get to a 50% increase in foodstuffs from the scientific standpoint? Actually, have we got the skilled individuals to actually do those things, because if you do not sort out the issues Mr Taylor was raising a moment ago the "easily" bit gets deleted from that?

**Professor Crute:** I think we have to be clear. It is very easy to use a broad brush and get the UK and north-west Europe confused with the developing world, et cetera. The truth is that in the bulk of the developing world, or in a substantial part of the developing world they have not enjoyed the fruits of the last revolution really. In India certainly and China yields are increasing, but I was in India just before Christmas and it is quite clear that the same issues we are talking about now they are talking about because obviously they have got people in the IT industry and getting them into things which relate to food crops—they have got the same problem with the levelling off of yields. But if you look at many countries in the developing world we are really talking about just getting the sorts of things into place that we would take for granted, which is adequate crop nutrition in terms of nitrogen, phosphorous, potassium in the right places. I mean, fertilizer costs in Africa are just unbelievable. You could not imagine poor farmers in Africa being able to afford them. There is virtually no fertilizer manufacturing that goes on in Africa and yet there is energy available. There would certainly be hydro energy available to do that. Then essentially pest and disease control, which we take for granted, is something else involved. So actually the gains which we got really you could say almost in the 1920s are available if we actually apply today's knowledge. I think the issue about the future, where you go beyond it, what we need to be doing is we need to be pushing the envelope in our part of the world so that to some extent when you are looking to 2050, the



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4 February 2009 Professor Ian Crute, Mr Bill Clark, Professor Brian Thomas and Professor David Pink

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point you were making about doubling, then that is where we have got to go because we have done a lot in the last 30 years. We have doubled the yields. So I think it is applying the technology which is already available to us and the knowledge we already have more effectively in the developing world whilst pushing the technology in our part of the world. We have not really mentioned much about land. Of course, one view—I think not necessarily a well-informed view—would be that we can do an awful lot just by ploughing more land. I think in the submission I made it clear that this would really be a rather dangerous thing to do because at the end of the day that really effectively gets you into a major exacerbation of climate change in terms of carbon release and all sorts of other things.

**Q186 Chairman:** I was going to ask you, one of the real challenges is can all this be done sustainably? I know “sustainably” at the moment has become the buzz word, but somebody came and told me that one litre of biofuels consumes 9,000 litres of water. I received that as a piece of information, whether it is true or not, but it just seem to me that we are pushing the resource—the land, the soil, the basics—of agriculture and potentially we are going to push them to the limit. Is there enough of those resources to go around?

**Professor Crute:** For me the greenest and most sustainable way forward has got to be to maximise the efficiency of the conversion of solar energy into chemical energy which we use for our own purposes or we feed to livestock as an intermediate in the process. I used some words of this sort in the submission. Therefore you take your best land in your most conducive environments and you essentially do agriculture and produce food in the most efficient way. That leaves you options on land in other places for which you use that to provide the other services. To mix the two things up effectively in my view is not a green option. It is not a sustainable option. You talked at the beginning, Chairman, about what keeps you awake at night. There is another major issue which we have not really talked about and that is the fact that in the OECD countries of the world, of which we are part, we have the luxury of having close on 50% of the productive agricultural land, but we actually have probably only about 22 or 23% of the world’s population. So we can be profligate with our land. If you look at South Asia and India, China, the Pacific going down

to Australasia, it is almost the inverse. You actually have close on 50% of the world’s population and about 24% of the world’s agricultural land. So it seems to me there are only three options in this scenario. We use our land to produce food and we move it, or people move, or they produce food by cutting down rainforests and we re-forest all of the forestation of the Northern Hemisphere which we removed in order to actually develop as we did way back. That is a very simple sort of synopsis in one sense, but it brings into focus the importance of land as an entity and the efficient use of land and actually the fact that we do not value it, neither do we value in North West Europe the fact that we are actually in extremely favoured environmental conditions, probably getting more favourable with climate change and we have an obligation on two counts. One is to make sure that we do produce food because actually we are going to become very important globally in food production and we should not ignore that. The second is to produce, as we said earlier, the technology which will allow others to produce food more efficiently.

**Q187 Chairman:** Professor Pink, a closing comment.

**Professor Pink:** This goes back to the comment that there is a definite tension there about a coherent policy and taking account of what effects different policies have. For example, the Countryside Stewardship Scheme is a blunt policy because you are actually valuing the environmental benefits you are getting, whether it is grade one land or poor land. In actual fact, as Ian says, you take out your grade one, your best land, out of that sort of thing because that is not what you want it to do. You want it to produce food. It is the other parts that you need to actually address your environmental policy to and it is that sort of cohesion between different Government policies that does not seem to be there.

**Chairman:** Well, gentlemen, if we could have carried on around a dinner table we could have had, I think, an even more exciting conversation than we have had, but what you have said has been very helpful and stimulating and I think has given us an awful lot to reflect on, certainly from the scientific perspective. At this stage in our inquiry we are looking to say what are the challenges, what are the things we have got to deal with, and you have certainly helped us answer some of those questions, so thank you very much for your oral evidence and also for your written contributions. They are very much appreciated.

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**Supplementary memorandum submitted by Rothamsted Research (SFS 15a)**

**ENSURING INDUSTRY-RELEVANCE AND OPPORTUNITIES FOR SCIENTIFIC ADVANCES  
ARE OPTIMISED IN AGRICULTURAL RESEARCH**

**1. BACKGROUND**

1.1 This short comment paper is prepared at the request of the House of Commons Environment, Food and Rural Affairs Committee following discussion with Rothamsted Research about the way to fund agricultural research in the UK such that it ensures both opportunities for scientific advances and continuing industry relevance are both optimised.

1.2 The Rothschild report in 1972 recognised that agriculture requires a “proxy customer” (then identified as MAFF)<sup>11</sup> to commission relevant research on behalf of an agricultural industry that was comprised of large numbers of small enterprises. For about a 15 year period—from *ca* 1974 to *ca* 1989 arrangements worked quite well despite early misgivings in the scientific community.

1.3 In essence, funding allocated from the “science vote” to MAFF was strategically allocated to broad areas of scientific activity in support of different industry sectors. For example: “vegetable crop breeding”, “cereal disease control”, “poultry diseases” etc. The funding channelled through the (then) AFRC<sup>12</sup> to relevant institutes which had a clear obligation to meet industry priorities. There was one primary objective for the use of these funds; to improve the efficiency and competitiveness of the UK agricultural and horticultural industries. Industry representatives were influential over the specific problems and research topics addressed by institutes through membership of governing bodies, MAFF committees and AFRC Council. Scientists accepted their obligation to take up new projects and drop others under pressure and influence from the industry.

1.4 For the last 20 years (from *ca* 1989) there has been a steady erosion of both funding and the priority directed towards “industry relevant” research in agriculture and horticulture. There have been a number of different reasons for this including the creation of Defra and BBSRC<sup>13</sup> in place of MAFF and AFRC. In Defra, a combination of the following means that the agricultural industry now sees little of direct benefit emanating from Defra research expenditure:

- drastic reductions in Defra budgets for research;
- a policy shift that emphasised environmental issues over economic production;
- the loss of the concept of government as a proxy customer; and
- exclusive emphasis on policy-related research.

1.5 A positive innovation in the last 10 years or so has been the operation by Defra (with BBSRC) of a series of LINK programmes which have enabled close public-private partnering in pre-competitive research of direct relevance to industry needs. Successful LINK projects have done much to maintain the positive association between the agricultural industry and the UK research community.

1.6 In BBSRC, the priority accorded to internationally competitive science, the need for research institutes to be assessed by the same criteria as universities and a positive policy not to support applied research (which was seen to be the role of Defra or industry) has meant that those scientists with an inclination to work on applied, problem-solving projects with industry relevance have been devalued (and many have been made redundant) while priority has been given to the recruitment and retention of scientists in institutes that could generate research income from research councils in competition with universities. The distinctions between institute science and university science have become increasingly blurred and, until recently, practical application of science (with the exception of protecting intellectual property and creation of spin-out companies) was not accorded high priority.

**2. A MODEL FOR ENSURING OPTIMISATION OF SCIENTIFIC ADVANCES AND CONTINUING INDUSTRY RELEVANCE**

2.1 The period following the Rothschild transfer of science vote funding from the research councils to government departments as a proxy customer is suggestive that returning to something akin to how this arrangement worked might be a good direction in which to move.

2.2 The objectives for the use of funding for research need to be clearly enunciated and unless this is done there is unlikely to be beneficial change. For two decades, the long-range objectives have not been clearly enunciated even if short-term expedient objectives have been clear.

2.3 It is suggested that a distinction is drawn between funding which is allocated primarily to enable high quality and novel “investigator-led” projects to be pursued and that which is allocated specifically to ensure that practical problems of direct interest and relevance to particular sectors of the agriculture and

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<sup>11</sup> Ministry of Agriculture, Fisheries and Food.

<sup>12</sup> The Agricultural and Food Research Council.

<sup>13</sup> Biotechnology and Biological Sciences Research Council.

horticulture industries are being addressed. On the assumption that this is accepted, a determination would need to be made of the magnitude of public funding (from the total sum available) that it was considered appropriate to allocate to the latter.

2.4 It would be appropriate for there to be four constituencies with a legitimate interest in the way this funding was utilised:

- farmers, growers and their technical advisors;
- suppliers of goods and services to the agricultural industry;
- one or more government departments with an interest in land-based activity;
- one or more research councils representing both the scientific community and the public at large (at arms-length from government).

2.5 Structured and reasoned debate and advocacy among the parties could be the vehicle by which allocated funding was partitioned between an agreed set of sub-divisions of industry-relevant activity. Doubtless economic value, perceived opportunity, relative risk and numerous other factors would enter the discussion. The sort of sub-divisions might be as broad as: horticulture, arable agriculture, non-edible crops, dairy, livestock—for example (but this would need discussion). The system would have to allow for an argued reallocation at about five year intervals. It seems reasonable that the Agriculture and Horticulture Development Board (AHDB) alongside Defra and BBSRC, as the major stakeholder research funders, would have the primary responsibility to recommend and agree proportionate allocations.

2.6 For a fixed duration, perhaps five years, such proportionate allocations of public funding as had been agreed would be ring-fenced and dedicated to meeting the specific needs of the sector for which they were allocated.

2.7 At the same time, one or more primary research-providers for each sector would be identified. This is necessary to ensure there is sufficient financial stability and confidence for a research organisation to develop and implement a strategy of investment in relevant scientific (and other) skills, specialist facilities etc.

2.8 Identification of: the magnitude of research funding; a five year horizon to work with; and specification of the research provider(s) who would be given the responsibility of delivering industry-relevant outcomes, provides the canvass on which the detail of specific opportunities, research areas, problems and policy priorities can be painted.

2.9 There is probably no better way of drilling into and agreeing the detail of dynamic, forward-looking and relevant research than to establish direct dialogue between senior research managers in provider organisations and those who represent business leadership positions in the agricultural industry. In broad terms, the consortia that LINK can create may reflect (but on a more permanent and less project-specific basis) the type of public-private committee structure that would be established. A very substantial knowledge transfer component would be implicit and embedded in the whole research process from the outset—and substantially more resource than hitherto would be allocated to the practical implementation of research findings where this was clearly justified. A key obligation on all parties would also be to ensure the implementation of a programme that was sufficiently well balanced as to ensure the continued existence and succession of key scientific expertise and skills that the industry could continue to draw on in the long-term.

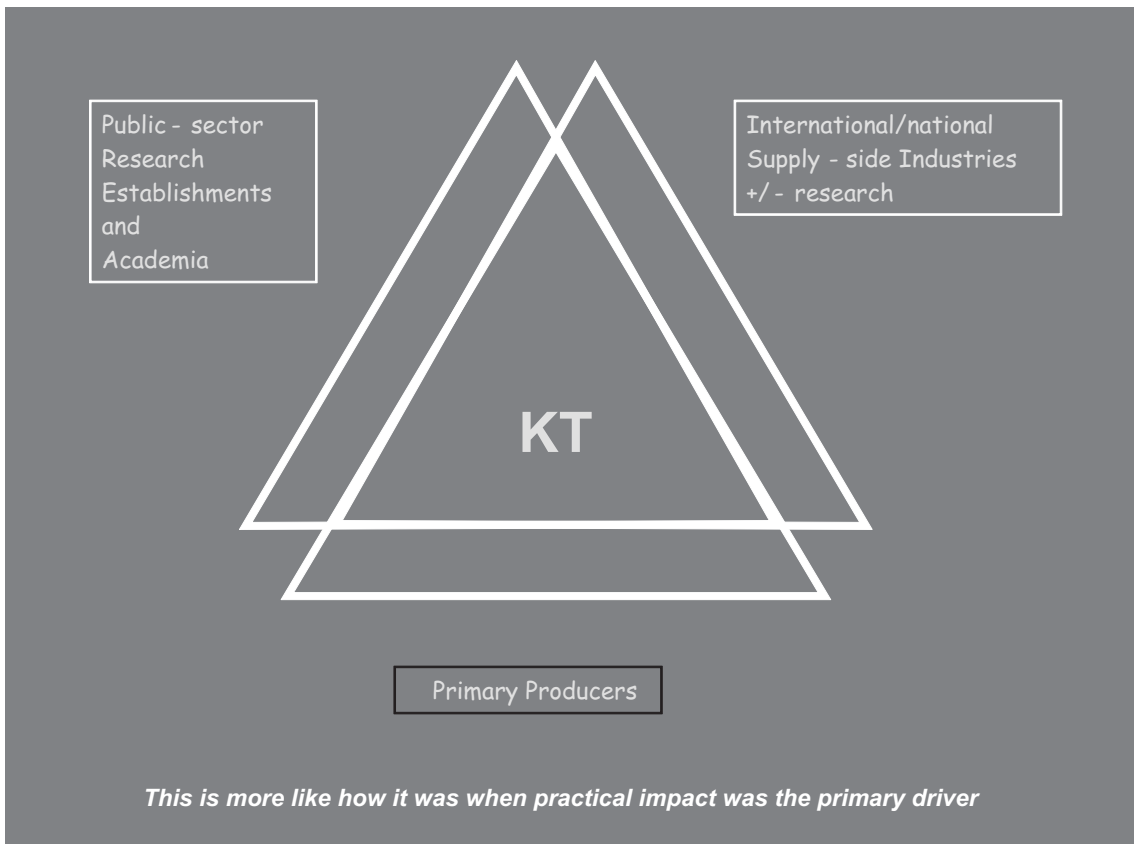
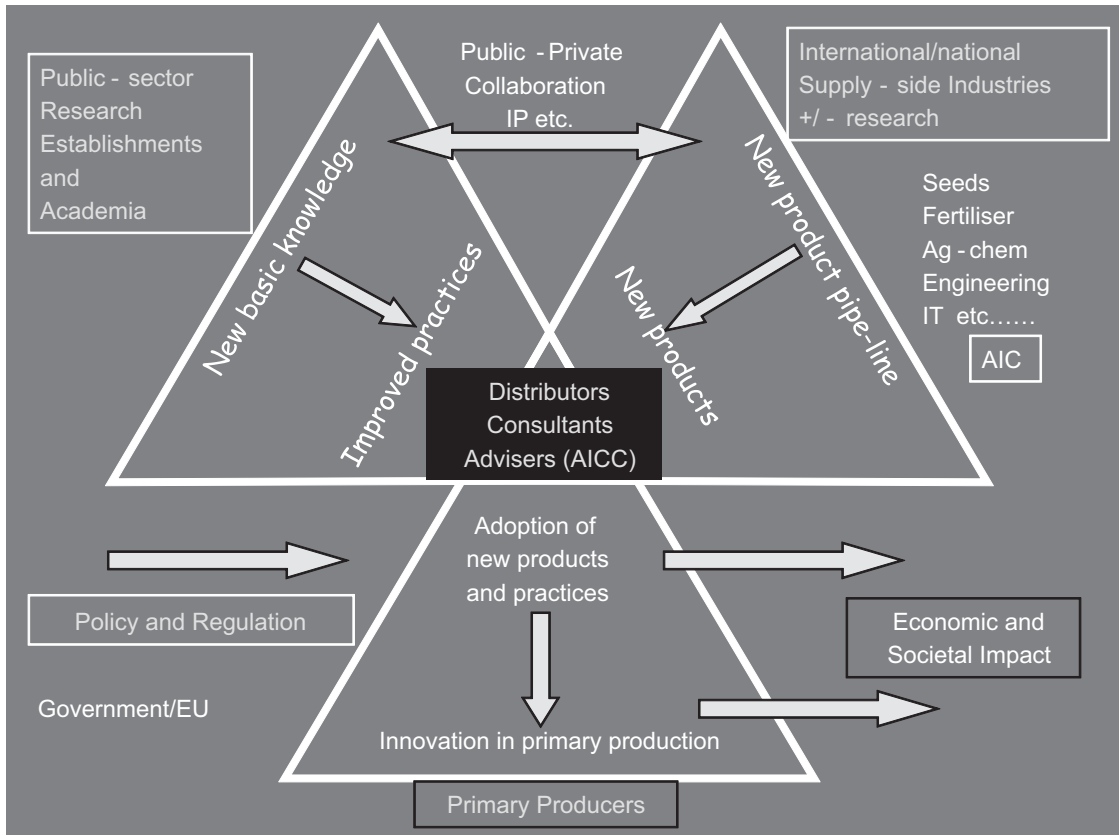
2.10 Review of impact and outcomes achieved by the research community on behalf of the industry would be conducted regularly on a five year cycle and would be the responsibility of the sponsor bodies (Defra, BBSRC, AHDB) where the criteria for success from the investment made would be based on the extent of innovation and progress made towards advancing the economic performance, sustainability and competitiveness of the sector in question.

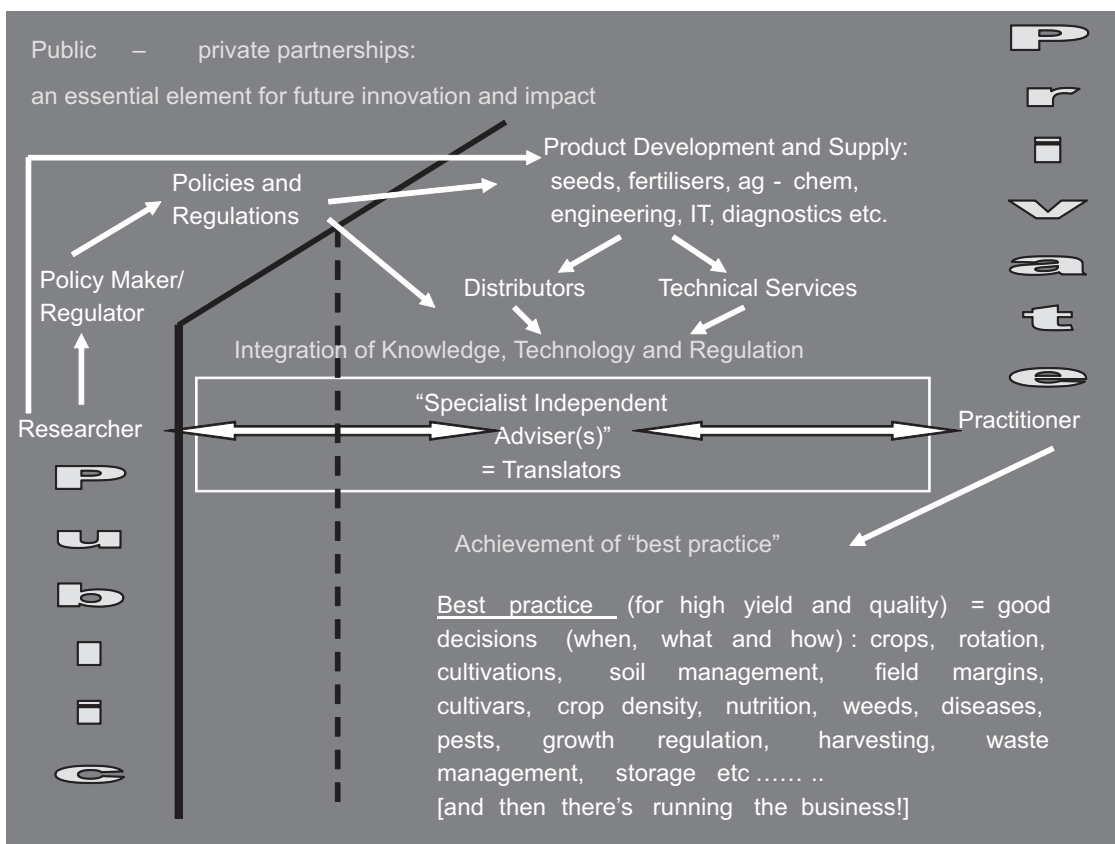
2.11 The diagrams (Annex 1) provide a schematic overview of the interactions, primary players and issues (although not cast explicitly to illustrate the operation of the sort of model described above).

*Ian Crute*  
Rothamsted Research

*April 2009*

Annex 1





Annex 2

DEFRA LINK PROJECTS AT ROTHAMSTED RESEARCH

- Integrated management of herbicide resistance.
- Integrated management strategies for varieties tolerant and susceptible to orange wheat blossom midge.
- Managing potato cyst nematode through maximising natural decline and population suppression.
- Biofortification of wheat and selenium through agronomy and genotype selection to increase human dietary intake.
- Understanding evaluation and selection of azole resistance mechanisms in UK populations of *Mychosphaerella graminicola*.
- Managing uncropped land in order to enhance biodiversity benefits of the arable farmed landscape.
- Improving water use efficiency and drought tolerance in UK winter wheat.
- Integrated control of bean seed beetle *Bruchus rufimanus*.
- Challenges from climate change for disease management in sustainable arable crops.
- Development of an integrated pest management strategy for control of pollen beetles in oilseed rape.
- Using legume based mixtures to enhance the nitrogen use efficiency and economic viability of cropping systems.
- Sustaining the effectiveness of new insecticides against aphid pests in the UK.

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**Wednesday 25 February 2009**

Members present

Mr Michael Jack, in the Chair

Mr David Drew  
Mr James Gray  
Lynne Jones  
David Lepper

Dan Rogerson  
Dr Gavin Strang  
David Taylor  
Mr Roger Williams

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*Witness:* **Ms Lucy Neville-Rolfe**, Executive Director, Tesco, gave evidence.

**Q188 Chairman:** I welcome everyone to our third evidence session of the Committee's inquiry into securing food supplies up to 2050: the challenges for the United Kingdom. I formally welcome Lucy Neville-Rolfe, Tesco's executive director. Thank you very much for agreeing to come and give evidence to us this afternoon. By way of introduction, perhaps I may ask whether the issue of food security is one that Tesco recognises in the wider context. Bearing in mind that it was something that travelled very quickly up both the national and international political agenda last year, culminating with the world food summit in Rome in June, what are your general observations about the policy response to the sudden increase in world commodity prices and some of the food riots that occurred in the less developed world which have triggered the current debate and response to the subject of food security?

**Ms Neville-Rolfe:** Thank you for the honour of being invited to give evidence today. The issue of food security is obviously one that we recognise. Over the past two or three years we have experienced a gradual rise in commodity prices that ended up with huge peaks last year. One can only be concerned by things like food riots around the world particularly as we now operate as a retailer in 14 countries. We are probably engaged in nearly 100 countries if one looks at all the different parts of the food and non-food supply chain. I am delighted that the Committee is taking a long-term perspective on this issue and grappling with what seems to be a very complex issue. It is very easy to lose sight of the longer-term issues when considering food policy. As the Chairman will probably know, this has a lot of resonance for me. Not only do I come from a farming background; I started my career in MAFF, now DEFRA, and in my current capacity within Tesco I see all aspects of production in the food chain both here and around the world.

**Q189 Chairman:** At the heart of my question is whether you recognise the debate on food security as an issue; in other words, is there a potential threat to the long-term supply of food? As a major world business in the food industry your principal task must be to keep the shelves of your shops full for your customers. Therefore, your view of what one might call food security may be more a matter of food procurement and a logistical challenge as opposed to the centre of the debate that is focused on the long-term supply of food to feed the world. Is there a Tesco-specific view and a world view? I just

wonder whether you see the world issues. You might have observed all those people trooping off to Rome to discuss the problem of food security but not seen a problem at all, just carrying on doing what you do which is to fill up the shelves and get the job sorted.

**Ms Neville-Rolfe:** As a company we try to take a long-term view. Obviously, our main job is to try to fill up the shelves with the right range and quality of goods at the time and wherever we operate, but we go overseas and into new markets. It is because of the growth of population particularly in China but also India that some of the longer-term projections to which you refer implicitly have been made. We have also done quite a lot of work on climate change because we recognise it almost as an opportunity but also as a risk assessment. Climate change will make a very big difference to the planet and the areas in which we operate.

**Q190 Chairman:** I accept that as a company you take it seriously, but against the background of an issue like climate change where your business expands into new markets how does it plan strategically to take into account some of the big long-term issues when you take as an example procurement strategies? When the FAO sets targets, such that the world should increase its food production by 50% by 2030 and double it by 2050, how do you as a business react to it? Do you recognise those as valid targets and, if so, what is Tesco's reaction to the impact of those targets on the agricultural supply chain?

**Ms Neville-Rolfe:** We would always be very respectful of science, so if those sorts of things are being said and that is the way forward we will say that the scientists appear to have come to that view, in the same way that Stern and others have come to a view on climate change, and we had better plan within that framework. We are not the government and there is not all that much we can do, but we can do something within our strategic planning to think in what direction things are going. One of the issues you do is make sure you continue to have good supply relations in each of the countries in which you operate so you get a good supply of food of the right quality. The second thing we would look at is whether the science base is appropriate for the medium to longer term. One of the things I would be happy to talk about is how we have tried to do some applied research that used to be done by people like ADAS but is no longer done to help producers to be

25 February 2009 Ms Lucy Neville-Rolfe

more efficient in the UK. I am sure that similar initiatives will take place increasingly in Korea, Thailand or wherever.

**Q191 Chairman:** We shall talk specifically about research and development later on. I understand that recently you have been to China. Whilst for you as a company it represents an opportunity it is also a potential challenge because it is the most populous nation on the planet. The former Prime Minister of China, Zhou Enlai, used to say that his task was to ensure that 1.2 billion people had three meals a day. That is quite a task. The perception about food security issues and the challenge to ensure that China's burgeoning population is properly fed is the context in which a business like yours might eventually have to trade. Perhaps you can give us an insight into how you see the food security issue from the other side of the planet in a place like China.

**Ms Neville-Rolfe:** China has been growing and has a very large population. In the eastern part of the country where we currently operate there is increasing wealth. Logically, that is a good place in which to think about establishing a retail business. One of the reasons the Chinese seem to be pleased with Tesco's investment is that we bring the experience of Britain in terms of food safety and productivity. One of the pieces of work we have been doing, and will do increasingly, is to share learning on the supply chain work that you will have heard about from people like the IGD. Does that answer your question?

**Q192 Chairman:** The reason I ask that question is that it has been said one of the drivers of the debate on food security is, first, the growing demand through sheer numbers of a country like China and, second, the changing dietary requirements of the Chinese as they move from an arable-based diet to one which involves livestock and all that goes with that. If you are developing a business in China you must decide on the supply chain and therefore the security you can apply to it if you are to meet the needs of your new customers. I am just interested to know where Tesco and China look to secure the supply chain. Does it look to developing indigenous agriculture or to the major suppliers in the southern hemisphere like Brazil as a way to secure food inputs to sustain a business like yours?

**Ms Neville-Rolfe:** Everywhere it will be a mix, but the vast majority of food tends to be sourced in the country in which we operate. Although you suggest that the Chinese will eat more meat and so on the big sellers are oil, rice, seaweed, supplies and all the things that you would see in their stores. We are quite flexible in our business model. We do research in the market and look at customer trends and then work with local staff to try to build up a consumer offer that is attractive and that will include a lot of local food. We will work with local supply-based entrepreneurs and also bring in things from overseas particularly where there is a climatic difference. Obviously, the seasons change and that is as true in China and Korea as it is in the UK, but as in the UK we have strong relations with very local suppliers,

because China equals about 25 UKs; it has many different regions and provinces and each area in which we operate is separate.

**Q193 Chairman:** In April of this year Chatham House produced a research paper on this subject which highlighted a number of key supply side factors that it believed would have a very important impact on prices and the supply of food in future.<sup>1</sup> It referred to the rising cost of agricultural inputs especially energy; scarcity of water on a global basis; the competing demands on land for all the things you do; and climate change. You indicate that Tesco clearly recognises climate change as an issue, but does it recognise the other factors referred to by Chatham House as key influences on the security of the food supply chain? If so, bearing in mind your earlier comments that Tesco thinks strategically, how are you dealing with those issues strategically in terms of both your Western European business and your growing presence in the Far East?

**Ms Neville-Rolfe:** We would have all those issues on our agenda. We have spent a particular amount of time on research into climate change about which I am happy to talk to you. Several years ago we also highlighted water as a geo-political issue. We try in a practical way to make sure that water is used sensibly in our own operations whether it is in stores or depots. We work with our supply chain to try to minimise the use of water. Going forward, we see that the clever use of water will be very important to the sustainability of different areas in which we work. The UK is lucky because it has a very good supply of water although, unfortunately, it is not always in the right place, but if the government looks forward to 2020 or 2050 one of the things it needs to think about is how to ensure we have enough water.

**Q194 Chairman:** I think it would be helpful if perhaps by means of correspondence you could develop some of the points of your policy approach to this to give us an idea in practical terms of what you are doing to address these issues, particularly taking into account the perspective of the two FAO targets I have mentioned. To move to the role of DEFRA as the government department which is tasked to be in charge of food, perhaps you would say a word on Tesco's view of what it should be doing in order to hold the ring as far as concerns the government's response to the challenges of food security that we have been discussing for the past few minutes.

**Ms Neville-Rolfe:** As I see it, DEFRA has the strategic role within government of tackling these sorts of issues and bringing together those various issues for the agricultural production and food industries. Climate change has now been hived off into a separate department, but in a sense that is an opportunity for DEFRA because it means it can spend time thinking about what is needed for the agricultural resources and supply base, food and retailing, because it is our sponsoring department and brings together what is done in different

<sup>1</sup> Chatham House, *Rising Food Prices: Drivers and Implications for Development*, April 2008

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**25 February 2009 Ms Lucy Neville-Rolfe**

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departments. In my experience there is a tendency in Whitehall for departments not always to be as joined up in policy as they need to be. To that extent I think that is a role for DEFRA. I know that in the past the Cabinet Office has done some work, but in a sense that has now been put back with DEFRA so it can think about these things. These are very long-term issues. I believe that the department has to think about both the shorter-term and longer-term issues. Therefore, one needs a strategy going forward to 2050 and to think what that will mean in the shorter term.

**Q195 Chairman:** You understand better than a lot of people how government works from the inside, but you are now looking at it from the outside. In terms of the way DEFRA has again embraced its role in food as one of the leading retailers in this area in the country have you been involved in any of the discussions with the department about how it re-engages in the whole question of its responsibility towards security of food supply?

**Ms Neville-Rolfe:** We have certainly made submissions to the various inquiries. We are not involved in its particular advisory committee on food but it has one of the other retailers on that. It works closely with the British Retail Consortium of which I am a leading supporter. I think it does want to listen and it is also interested in the practical angle that we are able to bring to it, so where a new regulation comes in the question is: will it or will it not work? Where something is to be done, whether on the framework directive on water or new CAP regulations, can it talk to us, as it has done ever since the days of BSE, in terms of what we can practically do? I think its main focus tends to be more on the production and food chain industries to whom you will be talking and increasingly non-governmental organisations.

**Q196 Chairman:** Apart from getting a lot of people round the table to talk about it, what do you think DEFRA could be doing? First, what do you think a government department should be doing in an area which is essentially a private sector supply operation? Food has been sub-contracted out to the supermarkets, the food service companies and so on; in other words, the old days of the ministry of food have gone. Apart from getting people to talk about the key issues we mentioned earlier, what do you think DEFRA ought to be doing to address the issue?

**Ms Neville-Rolfe:** I disagree. I think that it does two or three important basic issues: one is to oversee the regulatory regimes within the UK and, crucially, its job is to negotiate in Brussels and increasingly in WTO and other world fora, with the US and China now becoming more important, on what should be done, how regulation should be formulated and even on climate change. That is a matter for Mr Miliband, but implementation of any climate change policy in our sector and the agricultural sector will be overseen by DEFRA. Therefore, it has a very important regulatory role in terms of what is the right thing to be done, doing it in a way that helps

the industry rather than gets in its way. As I hinted I think it needs to be good at negotiation in these international fora because our interests here are not necessarily the same as those of the French, Germans or other states. We have businesses in Eastern Europe and in Ireland, so we have an interesting perspective. It is terribly important that DEFRA does its bit and takes a whole chain approach from the consumer—I hope that we shall touch on consumer research at some point—right the way back to the farmer and the tractors and things that he needs to produce food. It seems to me that it has the time, expertise and energy to take a whole chain approach. As to R&D, it oversees long-term programmes that may take 20 or 30 years to change society. Who in 1990 would have known we would all have the Internet? In those days only the military had it. Research will be life-changing and in my view it is likely to lead to a big change in the challenge that faces us in 2030, 2040 and 2050.

**Q197 Chairman:** Do you talk to other major European retailers about what role you think the European Union should play in addressing this issue taking into account the fact that by 2013 there will be a further fundamental look at the Common Agricultural Policy? The origins of the policy were to secure Europe's post-war food supply and once again that issue resurrects itself. On the other hand, the changes which have occurred in the CAP have been designed to move away from central influence on production with strong emphasis on the environment and sustainability. Do you have a view? Do other European retailers discuss with you their perception of this problem?

**Ms Neville-Rolfe:** It is a very interesting question. When I was a young civil servant the main concern was food mountains and now people worry about whether there is enough to eat because of the problem of population growth about which we were talking at the start. We are members of Eurocommerce which is the retail association for Europe and the European Retail Round Table where big retailers come together to discuss these issues. We have talked about climate change and have spent a lot of time on food safety. We discussed GM food a few years back when it was an issue. We have not had a discussion in a collaborative sense looking forward to 2030 or 2050 and I think it would be a rather good idea to put it on our agenda for a future meeting. We have the mechanisms to do it. In a sense it is not our job but the job of the European Union to think about these things. They come forward with papers and experts try to translate them into something that is understandable and practical.

**Chairman:** We will probably have produced our report by the time they get round to doing that, so we must present it to your meeting.

**Q198 Dr Strang:** In the UK at the present what do you say are the main food supply issues that concern the directors of Tesco who are responsible for buying food?



25 February 2009 Ms Lucy Neville-Rolfe

*Ms Neville-Rolfe:* I asked that of one of my commercial colleagues this morning. When I asked him what kept him at awake at night he said that it was the consumer changing in a way that he had not anticipated. Obviously, at a time of recession people change their habits and tighten their belts, so we are always very aware of what the consumer is doing. Even the people who are buying always think: what will the consumer want and buy? That is the way we run our business and why we have been successful for a number of years. We always look at the consumer.

**Q199 Dr Strang:** In the past 10 or 20 years, perhaps longer, following the end of the Milk Marketing Board which presumably you will remember as you were in the ministry at the time, there has been a lot of discussion in the media and so on between the dairy sector and the supermarkets. The crisis that the dairy sector has had to meet has meant that it has not been able to expand and that is now reflected in the supply of liquid milk in this country. Do you have a comment on that?

*Ms Neville-Rolfe:* I have a lot of sympathy with the point. A couple of years ago we decided to change the way we dealt with dairy producers in the UK partly because of the trends you suggest. We moved away from buying milk directly from the processors to buying it through the processors but via a triangle that involved producers. We now get our milk from Tesco dairy farmers and pay them over 28p which is one of the best prices in the industry. We then get the comfort of security of supply and quality from dairy farmers. That has been a good move. Having been brought up in farming and in the area of agricultural policy I think the health of dairy farming is completely pivotal to the health of farming in general in the UK because obviously with the grass and so on that we have it is a very important area. We have also tried to support the dairy sector by putting the Red Tractor label on cheese and so on. It is an important area where I know DEFRA has tried to bring the supply chain together to improve productivity and some of the R&D, to which we shall come, is dairy-linked.

**Q200 Dr Strang:** Last year City University produced a report on sustainable food. One of the points it made was that where the major supermarket suppliers, not necessarily Tesco's, wanted to move down the road of producing food more sustainably this would not be reflected in the price. Is there a problem there? If they want to produce what they supply to you in a more sustainable way are you not able to reflect that in the price you pay them?

*Ms Neville-Rolfe:* Obviously, there are different bits of the market, for example organics. I explained the contract we had. But there is also a compelling point that a lot of people in this country need cheap food and therefore you have to work with the industry to try to ensure the food is available at a price that people can afford. That has been a particular problem in recent months. Equally, the dairy and

other industries have responded well. Indeed, the depreciation in sterling has given them a little bit of an opportunity in terms of import substitution.

**Q201 Mr Williams:** But is that not a little disingenuous? You are now moving towards a decent price for milk, but because for so many years the price was very low, in many cases below the cost of production, the production of British milk is now nearly one billion litres less than it was. The production of milk in Britain is going down at such a rate that liquid milk is being imported for processing. That is a huge waste in terms of transport and goodness knows what. Over a very long period of time you took the rather cynical view that to press down on the price of milk was a good thing for consumers but in the long run it has proved to be a very bad thing for them because British production has been reduced and now they cannot access what they want, namely British milk?

*Ms Neville-Rolfe:* I am not sure I see it quite like that. The dairy and other markets are competitive ones set within the framework and tone of the CAP. I think that a lot of the problems we have had in the dairy sector have stemmed from the regime in which we work. There is a limit to what we can do. It is a competitive market out there. You will probably be aware that we were asked by the government a few years ago to put up the price of milk and that ended up with an allegation by the Office of Fair Trading that we had in its view co-ordinated to get the price to move up. We did not agree that what we did was wrong though other supermarkets have accepted that they did, but ironically that was all in an effort to try to increase the price for the dairy farmer. The important thing about DEFRA is that you need the correct regulatory framework in these areas.

**Q202 Mr Williams:** I simply do not understand that. You might be saying that the European policy of intervention buying encourages production which forces down the price of milk, but surely if you look to the medium or long term in the interests of your business and the consumer you will look for a price that encourages investment in the business to ensure it is maintained so that British dairy farmers can produce the products that British consumers want which is British milk?

*Ms Neville-Rolfe:* I agree that what you want is a flourishing dairy sector in the UK. One of the problems is that there are a number of differences in efficiency within the dairy sector. That is one of the interesting aspects of the work we are doing at the University of Liverpool. All the farmers who supply us under contract also give data to the university on yield, mastitis and the environmental situation. That data is by cow, not tank of milk, and it will allow the academics at Liverpool to do the sort of thing that MAFF experts used to do when trying to improve the productivity of cattle, sheep or whatever in a period when government policy was to try to improve self-sufficiency. I believe that there is value in that sort of research, possibly in a publicly-funded way, if you can find the money, so you get the benefit of that right across the board. Obviously, our

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 25 February 2009 Ms Lucy Neville-Rolfe
 

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research results within the university will be published. Universities always publish their results for peer review which seems to me to be completely right. The dairy sector is difficult and we have to work to improve things.

**Q203 Chairman:** Before we leave supply chain issues, some people have expressed concern that the days of strategic stocks of basic commodities have gone and for a retail enterprise like yours a just-in-time delivery philosophy is the order of the day. If the taps of basic supply were turned off how long would it be before the shelves of Tesco emptied? Put another way, do you take into account supply chain disruptions of differing types in laying out your stall to try to ensure that you have continuity of supply of food? I am quite interested to know whether as a company you believe there should be strategic stocks of things at national, European or even world level in the event of serious crop failures in some of the major areas of production for example?

**Ms Neville-Rolfe:** This is a difficult issue. Our approach is to make sure we have good supply chains and extremely good traceability. We have a higher level of traceability than many others for safety reasons but also for reasons of continuity of supply. We try to have very good intelligence, so if it looks as if the price of rice will go up, say, we hope to find out about it relatively soon and are able to buy quantities forward to make sure that our consumers will be in a good place. Obviously, we also practise and have very clear crisis team management. A couple of us at the top of Tesco can press the button and that process will start with phone calls round the world if need be, lists and things. That means we are probably as well placed as anyone to deal with a crisis when it arises, but if you have a really serious crisis and suddenly lose two counties of Britain you must have proper government crisis systems that step in, as they did in a minor way when the chicken disease occurred in Suffolk. I was rather impressed by the way the government and local authority moved in to control it.

**Q204 Chairman:** I think it involved turkeys and avian influenza.

**Ms Neville-Rolfe:** It involved avian ‘flu which is obviously a very worrying disease. We place emphasis on having good teams and practising. We had a practice last week on an avian ‘flu-type crisis where we had a lot of putative fatalities in Scotland, unfortunately. We worked that through. It teaches you a lot about how to deal with these crises. I am not convinced that the sorts of stores we used to have many years ago where corned beef and other things in tins had to be turned over every two years are terribly germane to solving crises. You need to know what you are doing and move in, cut off supply and ration if necessary and quickly and with confidence bring in the people you need, with government being seen to be ahead of the curve and having links into it, rather than trying to build up a lot of strategic stocks. Obviously, you want to buy stuff from your own country because in time of war or strife that is a more secure base, but I do not think we have

moved quite as far as the Chinese who have been buying things in Madagascar, Africa and so on. Because we operate round the world we probably have some advantage in terms of intelligence about different supply chains.

**Q205 Lynne Jones:** What does Tesco think are the main trends in food on the demand side?

**Ms Neville-Rolfe:** The long-term trends are influenced by population and we talked earlier about how that will lead to greater demand for food. As to what in particular British people think, what emerges strongly from our research is health. We have an ageing population. Certainly, in Britain the salient issue of health has grown in importance. People want to buy more healthy food and also want more health, beauty and fitness equipment. Therefore, health is a trend. There are people who live on their own who need small amounts of food, take-away food and so on. In the past four to five years, particularly when incomes have gone up strongly, we have seen an interesting trend in provenance and localism, so people do not buy British so much as local produce. We have responded to that by bringing in local buying officers in a number of places round the country, for example buying local cakes or mushrooms for a few stores. Therefore, we have been able to access the supply base that we were unable to access when we said that they would have to deliver food into hundreds of Tesco stores across the UK. We have exceeded our targets and local sourcing has grown to over £600 million in two to three years. That was based on the trend for localism and provenance with people wanting to know where things came from. Another trend is green. If you ask customers to list why they shop environment comes in at no.4. It is not exactly clear what “environment” is; it may include health and safety, but even when we have had more financial trouble in the country that still comes through and we reflect that in low-energy light bulbs, insulation, more fruit and vegetables and so on.

**Q206 Lynne Jones:** You mentioned the impact of the recession. Has that affected the demand for different types of food?

**Ms Neville-Rolfe:** I think people have become more price and deal conscious and, therefore, we have had to change our ranges. We have brought in something called “discount lines” to make sure customers can get the same good quality items at a lower price. We find that people respond to lots of deals—I am sure you have seen that everywhere—such as three for one, Valentine’s dinner, link what you buy to a holiday, days out and those sorts of things. People use shopping lists to a greater extent and generally try to save money, but they still want to be able to go for a ride in the car and have a meal out at a restaurant which is why they want the deals. The more peripheral things are less important in their lives. Authenticity is more important. They spend more time at home which affects entertainment sales. I am sorry; I am going beyond food in these comments.

25 February 2009 Ms Lucy Neville-Rolfe

**Q207 Lynne Jones:** Obviously, in some ways the trend might be that perhaps people eat out less and so they want something special at home. On the one hand, there might be a demand for more expensive food and at the same time people look for bargains. In this era of climate change what has been the effect of what may be considered more responsible purchasing such as greater concern about the environmental consequences of food and animal welfare? Have trends been dampened by the recession or do they still come through strongly?

**Ms Neville-Rolfe:** Though it does not come that high up in the list if you take everybody, people do not change their values just because they have a little less money. You tend to find that on something like Finest products they will move from the more expensive to the less expensive items and the same on organics; and if they care about animal welfare that is something they still look for. They look for what is authentic, but they may stop eating at a restaurant and therefore trade in to some of the Finest lines. There is less impulse behaviour; people try to avoid spending money needlessly and cut down on waste. One tries to give them products that will help to avoid waste.

**Q208 Lynne Jones:** You said you responded to what you detected as consumer trends, but to what extent do you think supermarkets have a responsibility for encouraging responsible trends, say, on environment, animal welfare or even location? Some supermarkets, for example, have decided to source all their bacon and pork from entirely British sources. To what extent do you follow the demand and attempt to lead it?

**Ms Neville-Rolfe:** We will always be following consumers, but there are certain things that they care about and which we need to apply to all products: health, safety, minimum welfare standards and ethical trading. We apply minimum standards to those, so to some extent we exclude things in that way. We see produce produced close to home as a choice issue which is why we have tried to produce more local food. That is not to say that everybody must produce food close to home which would lead to an unproductive system within the UK. You would not get the comparative advantages of productivity which is needed to feed all the people we have to feed in the future.

**Q209 Lynne Jones:** What determines the minimum standards? Is there a case for limiting people's choice by requiring certain standards?

**Ms Neville-Rolfe:** Government and the EU and the society that influences them obviously limit it by setting industry wide standards. That means you have a level playing field between operators which is a good approach. Clearly, in certain areas like climate change, in which we are very interested, and organics we have tried to go the extra mile and do more things for consumers. When people were very well off a lot of the ranges at the top end were selling well. For something like organics it is probably flat

or going down currently because people feel less well off, but I was trying to explain that you need to edit out things that obviously are not safe.

**Q210 Lynne Jones:** Is it just the responsibility of regulation to define these minimum standards or would you as the largest supermarket chain see yourselves as having a role?

**Ms Neville-Rolfe:** I think we have a role in contributing to the debate and what is decided.

**Q211 Lynne Jones:** But you would not take a lead on it?

**Ms Neville-Rolfe:** We have taken a lead on climate change and we might do so on other things. For example, we have said we would like to see more responsible drinking, but there is a limit to what you can do as individual operators. It is a competitive market. In many ways if you want to get the right policy prescription there is something to be said for debating it. On carbon-labelling we try to put an indication on our products to show how much carbon has been used. We have worked with the Carbon Trust. We would very much like it if the carbon-labelling system was unified across the UK, the EU and other countries because then it would be more useful for consumers.

**Q212 Lynne Jones:** What is Tesco's attitude towards GM ingredients in food?

**Ms Neville-Rolfe:** In our own brands we do not use GM. I think that if a change were to be made it would be a matter for government and EU. If they felt that the benefits of GM, perhaps in terms of health and less use of water or whatever justified the introduction of products they would need to explain that and reassure the public. We would go along with that. At the moment we are where we are with our consumers.

**Q213 Lynne Jones:** You said you were respectful of science, but on this it sounds as though you are just responding to what you perceive as consumer demand?

**Ms Neville-Rolfe:** Not entirely. I am conscious that in some countries where we operate like America GM ingredients are used quite extensively. My hope is that increasingly one would see some research coming through on whether or not there have been adverse impacts on the consumer, wild life or whatever which a committee like yours could look at, but it is very much a scientific area where we would not have our own expertise.

**Q214 Chairman:** You appear to have accepted the status quo in the United States on GM. If you sell products to customers you will not set out to do damage to them in a litigious society like the United States. Having accepted the status quo there you would not see a leadership role if, for example, there were good evidence that you could minimise pesticide usage, water uptake or the use of manmade nitrogen by the use of genetically modified techniques that might help overall food security?

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25 February 2009 Ms Lucy Neville-Rolfe

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**Ms Neville-Rolfe:** If that sort of research came through we would want to look at it and debate it, but GM rightly is a regulated regime.

**Q215 Lynne Jones:** But to have a blanket policy for all GM seems to indicate that it does not look at the evidence in individual cases. There is quite substantial evidence that GM soya has been consumed all across the world with no harmful effects. On the one hand you claim to be concerned about the environment and are looking at the possible benefits to the environment but on the other hand you are also concerned about price. One of the issues now is that farmers try to source soya but are unable to get non-GM which pushes up prices.

**Ms Neville-Rolfe:** That may be right. Attitudes may change. At the moment GM products are not marketed in the UK under the various regulatory regimes that exist, but I take your point that maybe going forward because of the concern about feeding the increased population of the world will change regulation.

**Q216 Chairman:** There is no regulatory regime to ban GM; it just so happens that retailers have chosen not to offer it after a brief foray with tomato paste.

**Ms Neville-Rolfe:** But no GM is produced on UK farms, is it?

**Chairman:** No, but I do not think that is the point Lynne Jones is getting at.

**Q217 Lynne Jones:** But they use a lot of imported soya, do they not?

**Ms Neville-Rolfe:** Yes, and that is not reflected in the final product. Perhaps I misunderstood.

**Q218 Mr Williams:** What is the policy on GM in this country? As I understand it, the only policy is that you can label a product as GM free so long as it does not have more than 0.9% of GM content. That is the only regulation that is applied to GM products in this country.

**Ms Neville-Rolfe:** I was talking about GM being grown in this country.

**Mr Williams:** We were talking about retail products.

**Lynne Jones:** I am talking about imported stuff. To have a general blanket policy means that it is really not based on rational thinking.

**Q219 Chairman:** You said earlier that you hoped government would provide information and answers to some of the basic questions that Lynne Jones has posed. If you as a business take a strategic view of the food supply chain going forward to 2030 and 2050 you cannot ignore engaging in the debate about something like GM or any other new technology. I recognise that as a business you may not have access to all the answers, but on something like GM, which is a real issue, have you said to DEFRA as keeper of the faith that you are struggling to work out what your strategy and approach to these technologies should be and provided a list of things you would like to know from government which would help your long-term strategic thinking? Is that the kind of interplay

between a major retailer like you and government that you think is a legitimate form of activity as you work through the food security agenda?

**Ms Neville-Rolfe:** I think it is. We are always clear with government that we must listen to our customers and take them with us. Ministers are also very aware of that because customers of a supermarket chain are also members of the public. We do not use GM in our own brand foods, but we need to keep that under review in the light of the latest scientific advice. If you wanted to re-introduce GM in the UK I think the government would need to take a position on this.

**Chairman:** No. To be specific, some of the evidence we have heard points to a plateauing in recent times of arable crop yields. There is a suggestion within the scientific fraternity that if we are to increase arable crop yields arguments about water scarcity that we referred to earlier, the high cost of agrichemicals, plants that can fix their own nitrogen and the increased problems of certain pesticide chemicals come into play and we might want to embrace GM technology as a way of addressing those issues over a timescale that stretches into the middle of the century, but decisions on that must be taken now. Whatever those decisions are must by definition, if as a business you are to secure your long-term supplies, be ones in which you are involved. You cannot wait to follow the consumer; you must be part of the debate that takes place.

**Q220 Lynne Jones:** How can the consumer have a rational debate or discussion when you just have a blanket policy of no GM?

**Ms Neville-Rolfe:** The consumer may change.

**Q221 Lynne Jones:** You follow the consumer; you do not lead?

**Ms Neville-Rolfe:** If you want to move forward the debate on GM you need scientific research that articulates with evidence the sort of benefits that the Chairman seemed to be describing in terms of crops. If that begins to be the debate we shall be engaged in it, but that is not where we have got to at the moment.

**Q222 Chairman:** I presented you with my synthesis of some of the arguments we have heard. What I am really interested in is the way that you as a business look to the future and plan your strategy. I have enunciated the kind of challenges which are generally available in the literature and which by definition would affect the supply chain for arable crops in the next 20 to 30 years. Do you have somebody in Tesco who does that kind of analytical work, feeds it back to senior management, sets out the debates and issues with which you have to grapple and ask questions of and probes government about the factors that will contribute to the potential long-term wellbeing of the business?

**Ms Neville-Rolfe:** We do not have inhouse economists; we take external advice on those sorts of issues. We also log in to Chatham House which I think has done a leading piece of work in this area. As I implied at the beginning, at our strategy

25 February 2009 Ms Lucy Neville-Rolfe

conferences we look at risk and growth opportunities. You have provided me with the challenge of looking at four areas to which one might add the consumer and to come back to you on how we might look at it from the strategic standpoint, but obviously we are a company that runs stores and invests in some new areas like bank products and telecommunications; we are not trying to solve world hunger.

**Q223 Lynne Jones:** You are a big player in terms of the consumer in this country. You know that we shall be facing huge challenges in terms of food supply and climate change which you acknowledged. You implied that your company was concerned about these matters and yet you appear to be abrogating your responsibility to help, even if it is only having a dialogue with consumers, and you are not prepared to lead them in this area. You say that it is for the government to tell you what you can do.

**Ms Neville-Rolfe:** I do not suggest that we are not helpful; we would always be helpful. If there are specific questions on which we should engage in our consumer groups or whatever obviously we would be willing to do that. I was trying to explain that there is a limited amount of resources in a company like ours. We have put money and effort into climate change; we have invested £25 million over five years in the University of Manchester. We are not doing the work ourselves; we are paying for that work to be done as a contribution to climate change because we think that as a carbon-emitting industry there is an opportunity for us to do a better job and take less risk.

**Q224 Lynne Jones:** That is a valuable contribution to research which we will discuss in the next bit of this debate, but I return to the point that you are a player with huge pockets and you are one of the few areas of business endeavour that has not been badly affected by the recession. You appear to give the impression that you are a socially responsible company that is concerned about climate change and all these things but when it comes to leading your consumers rather than responding to demand you just opt out.

**Ms Neville-Rolfe:** There is listening and leading. What we try to do is have all these different links in to consumers. We have Clubcard so we see what they are spending as well as what they are saying within focus groups and so on. We look at that data and will be the leading adopters of ideas. That allows you to move things forward.

**Q225 Lynne Jones:** Again that is following?

**Ms Neville-Rolfe:** It is following where there is a willingness. To try to bring in products or policies where there is no consumer support is probably for others to do.

**Q226 Chairman:** I do not think that is quite what we are driving at. I am sorry if we do not make ourselves clear. What we are looking at are the scientific, practical and strategic challenges that face the supply of foodstuffs up to, say, 2030. Here we are in

2009. Over the next 21 years what are the key issues that will face us? The scientific evidence we have received suggests that you may have to look at alternative technologies in plant breeding and development if you are to sustain the supply of some of the basic commodities like wheat. It seems to me that, putting aside the consumer position, it is something that a company like yours ought to be engaging in to know whether the technologies out there are capable of sustaining the very supply chain on which you are dependent. That is the bit I am missing. I get the impression that your view of these big issues is quite short term and consumer-led, whereas the reality is that these are long-term strategic issues in which you should at least take an interest and be more proactive in testing out the hypotheses put forward by the scientific community about the types of threat that could impact on your business. As a director of Tesco you have a responsibility to ensure shareholder value; it is one of the key things that you do. If the shareholder value in Tesco in the next decade or two were potentially disrupted by the type of issue we have been discussing and you were found not to have been engaged in that you could justifiably as a business be open to criticism. I do not get the impression that you are very proactive in engaging in these issues.

**Ms Neville-Rolfe:** I am sorry if we are not doing as much as you feel we should.

**Q227 Chairman:** It is not for me to say.

**Ms Neville-Rolfe:** We link into expertise; we have an expert panel that includes a professor who knows about GM technology. A number of professors help us in these areas, so we are trying responsibly to know what is going on. I would support R&D in these areas. Public funding on agriculture and agricultural sector R&D expenditure has fallen back—I believe the NFU submission said as much—by 45% since 1986 and it has fallen further in recent years. That is a pity because the challenge of trying to produce more food with fewer resources is one for the agricultural science base that did so much in the 20th century to improve productivity. Obviously, genes and other things will be part of that work. If I have given the impression that I do not support that it is a wrong impression. We would be happy to engage where people ask us to engage, but there are only so many public policy issues on which you can spend a lot of time if you are trying to do the right job for your customers, run your stores and invest in them.

**Q228 David Lepper:** We have had evidence from a number of organisations, not just the NFU, about the fact that farming in particular has not received its share of the increased expenditure over the past few years on science generally. There has been a decline in R&D spending on agriculture and sustainable farming in particular. I was interested to note that Tesco has given £25 million to the Sustainable Consumption Institute at the University of Manchester. Am I right that there is no prohibition imposed by Tesco on how that funding for research

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25 February 2009 Ms Lucy Neville-Rolfe

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might be spent? If that institute looks into GM production, for instance, you would not be worried about Tesco's money being spent on that?

**Ms Neville-Rolfe:** No; they have a totally free hand. Obviously, we can make suggestions about things that we believe are problems. Their remit is to look at how you can encourage consumers to adopt a sustainable lifestyle. One piece of work they are doing currently is to look at water and we hope that some results will flow from that. There is a Nobel prize-winning professor and a number of cross-functional PhDs within the university who bring together different minds in a renaissance way to try to tackle climate change.

**Q229 David Lepper:** Does Tesco nominate in any way what area of research will be pursued?

**Ms Neville-Rolfe:** We are represented on the advisory committee. They have been given this pure remit, but they are keen to have suggestions from us and elsewhere. We have encouraged them to work with other universities overseas so there is better consideration of the consumption side of climate change. A lot of work has been done on operations and energy in the field of climate change but much less work on consumers and how to change behaviour. Frankly, the sort of psychological research they are doing is relevant in other areas, for example how to stop people overeating.

**Q230 David Lepper:** Is Tesco involved in other research funding either by doing it themselves or funding other institutions?

**Ms Neville-Rolfe:** There are a couple of things. We also support the initiative at the University of Oxford about animal welfare. It is developing production systems that improve animal welfare and farmland environment and help people make a reasonable return whilst following the best systems of animal welfare. We have been doing that for a number of years. We have just concluded a partnership with the University of Liverpool where we have set up the dairy centre of excellence at the veterinary school. That will focus on milk quality, farming efficiency, animal welfare, that is, mobility scoring, and environment in the sense of using less energy, water and so on on farms. We have individual data on cows which is fed into the university with a view to trying to improve the productivity of dairy herds. We also have an expert panel which has on it people like Professor John Coia, a clinical microbiologist from Glasgow who has just joined, and Carlo Leifert, an organic specialist at the University of Newcastle. We have a number of experts in other areas. Therefore, in a small way we try to support the science base, but we also feel that it is a very important use of public funds because it can make a huge difference on a long timeframe.

**Q231 David Lepper:** You do not see a situation where research funded by companies such as yours or other private funding will supersede the need for public funding for research and development?

**Ms Neville-Rolfe:** No. These are big issues. I think there should be international collaboration. It can be done elsewhere as well. There are other companies in the supply base like the food companies. I know that you are to see Unilever next. I am aware that they do a lot of product research from which we benefit. We also do quite a lot of product research. It is fascinating to look round our unit where we test the quality of all our products. You have 19 days' worth of flowers. On day 19 it looks very nice; in some cases on day 30 it looks very nice. In other cases they are dead on day 30,<sup>2</sup> but in my view all of these little bits of applied research which we do not call R&D help to improve the supply chain and the returns for UK producers.

**Q232 David Lepper:** You must keep an eye on what your competitors are doing in terms of funding research and development work. Can you give us a snapshot or overview of it because you are the only one of the big supermarkets that we have before us. We have had written evidence from others.

**Ms Neville-Rolfe:** I think it would be wrong to try to summarise what competitors are doing, but I am sure that the British Retail Consortium can assist; or perhaps it is more appropriate if we let you have a note.

**Q233 Lynne Jones:** You have given £25 million to Manchester. Over how many years is that spread?

**Ms Neville-Rolfe:** Over five years, but I think that for a non-pharmaceutical company it is an unusually substantial sum which underlies our commitment to do something to help with climate change. There are quite a lot of overlaps between climate change and the food security issues that we have been discussing today.

**Q234 Chairman:** We hope that farming and food production will take its place in that. Does Tesco have a view about the quality of British-based science in the areas that we have been discussing? You mentioned earlier the reduction in expenditure as highlighted by the NFU's evidence, but in terms of the quality and quantity of British science available in this area do you have a view as to whether it is good enough?

**Ms Neville-Rolfe:** I do not think I have a very up-to-date view, but historically I think we have had a superb science base in this country which can always be tapped. If you have the potential to research into fascinating challenges and disease and the money to do it you can build up great academic institutions.

**Chairman:** It is quite a big question to ask you, but perhaps you might again consider it. You mentioned the need for publicly-funded and led science to deal with the range of challenges on which we have touched. If there are things that you think as a business need to be looked at but which as yet have not been it would be very useful for us to know where

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<sup>2</sup> *Witness amendment* "You have 14 days' worth of flowers. On day 9 it looks very nice; in some cases on day 16 it looks very nice. In other cases they start to die after day 14".

25 February 2009 Ms Lucy Neville-Rolfe

you think the holes are, if you like, in the British scientific capability when it comes to dealing with issues that are related directed to food security.

**Q235 Mr Williams:** The approach to food by DEFRA seems to have changed quite rapidly over the past 17 or 18 months from a position where they believed that the food supplies to Britain depended upon access from many sources and to have very little to do with home production. Home production seems to have become more important. To that effect they have set up a number of bodies including the food strategy task force, a cabinet sub-committee and a council of food policy advisers. To what extent does Tesco feel involved in the new structures that the government has set up for the delivery of food policy?

*Ms Neville-Rolfe:* To be honest, I think it is early days. The industry is represented on one of those committees by ASDA and the British Retail Consortium in which we participate enthusiastically has had discussions on these things. Looking forward, we hope that they will meet the need to look strategically and have a good food chain approach, but I would say it is early days. I have had a good meeting with the agriculture ministry on anaerobic digestion which is a way to encourage the use of waste to make energy. I know that they are getting on with it but it is early days.

**Q236 Mr Williams:** You mentioned that membership of one of these bodies was held by the corporate affairs director of ASDA. Given the very competitive nature of the supermarket sector is it better to encourage stakeholders to be involved, to set aside the competitive element and concentrate on ensuring that the food market is sustainable?

*Ms Neville-Rolfe:* Absolutely, and it is great that the industry is represented. That is as it should be and I am sure we will be involved in other things. I agree that they will have many of the same concerns and needs as we do.

**Q237 Mr Williams:** Given the competitive nature of the supermarket sector, what role would an ombudsman play in ensuring that food production in Britain is maintained and there is a decent return to producers and a reasonable deal for consumers?

*Ms Neville-Rolfe:* Do you mean the sort of ombudsman that the Competition Commission is talking about?

**Q238 Mr Williams:** Yes.

*Ms Neville-Rolfe:* I do not think that it is designed to have that role. I believe the proposal is that it would look at the relationships between individual supermarkets and suppliers. Obviously, that goes alongside some changes to the code of practice to bring in written contracts, to have compliance officers and so on. There are various different changes. I think that the worry we have about ombudsmen is that they tend to be set up to look at the interests of the consumer. You see them in a number of other sectors. The ombudsman that has been proposed here is of a different character and

seems to deal with the needs of the producers or supplier. There may be issues about small producers but in my experience when these regulatory systems are set up it is the large group companies, often bigger than ourselves, in the main that will understand how to use them. Our concern about the ombudsman is whether that will end up being adequate from the consumer's point of view and also the cost.

**Q239 Mr Williams:** How can you talk about companies bigger than yourselves when you represent 40% of the grocery trade in this country?

*Ms Neville-Rolfe:* We do not represent 40%.

**Q240 Mr Williams:** It is 38 or 40%.

*Ms Neville-Rolfe:* No; it is 30% or less on some measures. We have said that we will look constructively when the Competition Commission comes out with its proposals. I am just trying to share with you looking at it objectively whether or not it will improve things, or can the same system, to look properly at disputes where there is a problem, be dealt with by another method?

**Q241 David Taylor:** Whether one third or 40% of the business in Britain goes through Tesco is not the point. You are clearly a dominant player in the market. The feeling I get from some of the answers you have given is that perhaps you are a little reactive in these matters but not at all proactive. For instance, I find it disappointing that there is no written submission to this Committee which would have helped it a good deal in being able to focus its questioning more precisely. I get the impression that you are standing aloof from what is happening in the area of government on food policy. Is that a fair comment?

*Ms Neville-Rolfe:* I think it would be unfair. If you want a written submission we will give you one, but I think the BRC put in a submission. We were asked to give evidence but I was not asked to provide a written submission. Obviously, I can provide one if you wish. I have also promised to follow up on a number of things. I am sure that in some areas we are reactive; in others we try to move the agenda forward.

**Q242 David Taylor:** So, you are enthusiastic; you do not wait to be asked and you make sure your voice is heard without waiting?

*Ms Neville-Rolfe:* Yes, absolutely, looking at the sorts of things we have discussed on dairy, climate change and product innovation. The Competition Commission conducted an inquiry over the past two or three years and found that the industry was competitive, and it found that Tesco was not the issue and was competing.

**Q243 David Taylor:** Proper formulation and delivery of food policy in the interests of all 61 million of us in the UK will not happen unless Tesco show perhaps a tad more commitment to this area

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25 February 2009 Ms Lucy Neville-Rolfe

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than has been evident so far. I do not blame you for that but the company is culpable in that regard.

**Ms Neville-Rolfe:** In a way we feel some pride in being one of the leading food companies in the world. I talked to you about the sharing of learning that we do round the world. I think we are respected for our technical teams that are out there in the supply chain talking to suppliers. It is perhaps a fair

comment that maybe we should spend more time just making sure that you, Mr Taylor, and others talk to them a little more.

**David Taylor:** And all of my colleagues, in particular Mr Jack.

**Chairman:** Thank you very much. We have benefited from your views and look forward to receiving from you further written contributions.

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**Memorandum submitted by Tesco (SFS 75)**

1. A NOTE OF EXPLANATION

1.1 It may be helpful to explain the limitations of this paper.

1.2 Tesco is not and cannot be responsible for food security and indeed agricultural policy in the short, medium or long term; that is a matter for Government.

1.3 Tesco is a retailer and contributes to the economy via innovation and product improvements like many other large firms. It deals largely with food products and has considerable expertise in some technical areas including food safety and quality and the supply chain. None of this makes us experts in long term food security.

1.4 In recent years we have also sought to develop in expertise in how food retailing can contribute to Government objectives on climate change.

1.5 That said, we are informed observers of the current state of affairs and would offer the following comments on the issues which interest the Committee to supplement the evidence given by Tesco at the Hearing on 25 February 2009.

2. CONTEXT

2.1 We recognise the widely-held view that global food production will need to increase by 50% by 2030 and by 100% by 2050 to meet the needs of a growing world population.

2.2 We share the view that some of the key constraints on growing production to these levels include:

2.2.1 Limitations on the amount of agricultural land, particularly as many parts of the world become more developed and more urban.

2.2.2 The challenge of climate change: the need to lower greenhouse gas emissions while increasing agricultural production; and the likelihood that increasing global temperatures will make some areas which currently produce food unable to do so in the future.

2.2.3 Other sustainability challenges, including the challenge of water depletion in many parts of the world.

2.3 We do not believe that—particularly set against these constraints—the right route to secure the increases in production required lies in an outdated protectionist approach to food production. Such an approach helped to secure large increases in global production in some countries—including Europe and the US—after the Second World War. However this was at the cost of huge economic inefficiencies, financial burdens on consumers and taxpayers in many countries and severe damage to the agricultural economies of many developing countries.

2.4 We believe that the right approach to the modern challenge of food security lies in competitive markets which enable comparative advantages to flourish, and which encourage the innovation and productivity increases that will be needed to feed a growing world population.

2.5 As an international business operating in 14 countries in Europe, Asia and the US, our sourcing policy in the face of these challenges can be summarised as:

2.5.1 A commitment to international sourcing, so that consumers around the world benefit from the widest range of quality products at the best prices.

2.5.2 A commitment at the same time to source locally wherever possible. Consumers often express a preference for locally-produced products, and there can be significant advantages in terms of responsiveness to consumer demand, freshness and lower distribution costs and emissions. In the UK, approximately 90% of our fresh chicken, 95% of our fresh beef, 80% of our fresh pork and 80% of our fresh lamb is British, as are 100% of our fresh eggs and milk. We have also



in recent years significantly increased our commitment to local sourcing, opening a network of regional offices across the UK with dedicated buying, marketing and technical teams. We currently stock 3000 local lines which we promote through events, point of sale and marketing.

- 2.5.3 A determination to ensure that agricultural production for Tesco meets strong environmental standards. This is achieved through our “Nurture” scheme, an independently accredited global quality standard for fruit and vegetables which covers 15,000 growers in 70 countries. Alongside ensuring full traceability for our fruit and vegetables, Nurture requires adherence to high standards of wildlife protection and landscape conservation, sustainable farming practices, including the use of energy and natural resources, and the rational use of artificial pesticides, fertilisers and manures. Each grower is audited on an annual basis.

### 3. SUPPLY SIDE FACTORS

3.1 We agree with the recent Chatham House report that some factors—in particular water scarcity, climate change, land availability and the rising costs of agricultural inputs—require special attention and we address these below.

#### 3.2 *Water Scarcity*

3.2.1 Water scarcity is a significant and growing global issue. 70% of water used worldwide goes towards agriculture and food production. As the climate changes, some parts of the world will face fresh water shortages and by 2025, two-thirds of the world’s population may be impacted by scarcity.

3.2.2 We have begun to respond to this challenge by implementing water-saving initiatives in our businesses across the world. Our Chinese business uses rainwater harvesting and grey water for car washing and toilets; there are closed circulation car washes in our Polish distribution centres; and in the Czech Republic we have installed specially designed water efficiency fixtures and fittings. In the UK, our newly developed environmental blueprint for stores incorporates rainwater harvesting techniques which reduce potable water used by the store by 50%. We also use other water saving technologies such as taps with automatic shut offs or electronic sensors and low dual flush toilets. We have run consumer information campaigns, for example in schools in Turkey.

3.2.3 We recognise that more needs to be done in understanding and reducing the water footprint of the whole food supply chain. We are therefore working with the Sustainable Consumption Institute, established by Tesco at the University of Manchester, to understand better the issue of water scarcity, how it will impact on the supply chain in the future and the role we can play in mitigating it. The results will be shared freely so that the whole food industry can benefit. Areas for consideration include:

- 3.2.3.1 The cause and nature of the problem of water scarcity.
- 3.2.3.2 The possible solutions at a global level, including the role of technology and of water efficient production methods.
- 3.2.3.3 The scale of this issue for our business.
- 3.2.3.4 The role that we can play, by tackling the issue in our own business, working with our supply chain, and helping customers play their part.

#### 3.3 *Climate change*

3.3.1 Long-term sustainability and growth around the world depends crucially on an effective response to the global challenge of climate change. A failure to act effectively could mean we are threatened with significant and increasing economic and social disruption on the scale of the great wars and economic depression of the last century. Indeed there was a very interesting recent article in *Science* (November 2008) which suggests the fall of the Chinese Dynasties was linked to weakening monsoon power which reduced rainfall and hit harvests. There was also a dry period during the decline of the Mayans in Central America.

3.3.2 Tesco is committed to playing a leadership role in tackling climate change, in particular by innovating and investing in sustainable technologies and buildings, and using our relationship with customers to empower them to take part in a revolution in green consumption. As part of our climate change strategy, we are making significant investments in developing low-carbon stores and distribution centres. These investments will help us meet our long term targets set in 2007:

- 3.3.2.1 To reduce the CO<sub>2</sub> emissions from our existing stores and distribution centres by at least 50% by 2020, against a baseline of 2006. By the end of 2008, our UK energy use per square foot was half what it was in 2000.

3.3.2.2 To reduce by 50% the amount of CO<sub>2</sub>e used in our distribution network to deliver a case of goods by 2012, against a baseline of 2006. Last year in the UK we achieved a saving of over 10%.

3.3.2.3 To reduce CO<sub>2</sub>e emissions from new stores by 50% on average by 2020, from a baseline of 2006, developing environmental formats. Our recently opened Cheetham Hill store near Manchester has a carbon footprint 70% less than an equivalent store built in 2006 and will be a model for future stores.

3.3.3 Consumers account directly and indirectly for 60% of carbon emissions. We believe that engaging and empowering them is therefore a crucial aspect of tackling climate change. As an example, we are—alongside DEFRA, the Carbon Trust and the British Standards Institute—developing an accepted and commonly understood measure of the carbon footprint of every product we sell to enable customers to easily compare products, in the same way that they can compare products' nutritional content. So far we have labelled 100 products with their carbon footprint and we are working to footprint further products. We are also making it cheaper and easier for our customers to make green choices, through for example halving the price of energy efficient light bulbs and our Greener Living range.

3.3.4 In 2007 we began a five-year, £25 million funding programme for a new Sustainable Consumption Institute (SCI) at the University of Manchester. The SCI has been established as a leading centre for sustainable consumption research to develop research to define and accelerate the steps required to make a successful transition to a low-carbon economy and society; research that will be published and freely available. We are also working with suppliers to develop low carbon supply chains, products and services. This is particularly important in the food supply chain given what we know about the environmental impacts of agriculture. Through our Sustainable Beef and Dairy Projects, and the Dairy Centre of Excellence, we are working with suppliers to understand how the environmental impacts of production can be reduced.

#### 3.4 *Land Availability*

3.4.1 There are many competing demands on land, including for food, feed, timber, paper, fuel and development. This is on top of the impact of soil loss through erosion and desertification. It is therefore important that the right balance is struck in terms of land allocation and management.

3.4.2 Agricultural techniques have a particularly important role to play, with unsustainable methods leading to the deterioration of existing land stock and a lowering of yields. We are therefore committed to high standards of land stewardship, environmental protection and sustainable production within our supply chain.

3.4.3 One of the ways we approach this is through our Nurture scheme, summarised above.

3.4.4 On livestock, we are a core supporter of the Food Animal Initiative at Oxford University which has as one of its areas of focus the development of food production systems that deliver improved farmland environments, while the Tesco Sustainable Beef Project and the Dairy Centre of Excellence are both working towards finding solutions to the problem of land degradation.

3.4.5 We also recognise wider challenges in terms of land use, for example the production of biofuels. Biofuels have the potential to reduce greenhouse gas emissions compared to conventional fuels. There are, however, concerns about the energy used in growing the crops as well as the risk of deforestation, reduced biodiversity and diversion of production away from food crops such as corn or soy and the impact this may have on food prices. Recognising these concerns, and the conclusions of the Gallagher Review, we are working with the Sustainable Consumption Institute at Manchester University to formulate a long-term policy on sustainable biofuels.

#### 3.5 *The Rising Costs of Agricultural Inputs*

3.5.1 The price of agricultural inputs has risen, driven in particular by increases in energy, fertiliser and feed costs although there has been some easing since the peaks of 2008.

3.5.2 A healthy and sustainable base is at the heart of our business and we are committed to working with our suppliers to understand and respond to cost pressures in the chain. Our Sustainable Dairy Group is an example; we have a direct relationship with our dairy farmers and the industry-leading price we pay for milk, which we review on a six monthly basis, reflects the actual cost of production. Through this Group we are also exploring opportunities for group buying of key inputs to reduce costs and for greener energy and energy saving initiatives.

3.5.3 Through our Nurture scheme we help growers reduce their input costs. This includes encouraging farmers to use manure instead of artificial fertilisers, looking at water storage and capture and auditing energy use to see how savings can be made, through for example the routine maintenance of machinery.

#### 4. INNOVATION

4.1 Innovation is a constant feature of economic life, most notably agriculture if you take a very long term view. Historic breakthroughs included crop rotation systems which dispensed with the need for fallow; refrigeration which allowed imports of meat and dairy products from distant lands; and the advances in genetics of the last 50 years. As already explained to the Committee the Internet is a good illustration of the potential of innovation, sometimes coming from unexpected directions.

#### 5. THE UK PERSPECTIVE

5.1 We are confident that UK agriculture can benefit from an approach based upon open competitive markets which enable comparative advantages to flourish, and which encourage innovation and productivity growth. But we believe that other factors will be important in ensuring that these opportunities are translated into actual benefits, in particular:

5.1.1 An understanding of changing consumer demographics and demand.

5.1.2 An increased emphasis on, and investment in, agricultural R&D.

We address each of these points in more detail below.

##### 5.2 *Changing consumer demographics and demand*

5.2.1 Our approach in Tesco is to understand changing consumer habits and demands, and to communicate these to our producers and suppliers so that they can adapt and respond to them. We do in a number of ways, including through individual relationships, our producer clubs, our dedicated farming website ([www.tescofarming.com](http://www.tescofarming.com)) and TescoLink, which enables suppliers to access data such as store level sales of their products. This approach ensures that UK industry can develop to exploit changing markets and secure competitive advantage as a result. Some current significant trends include:

5.2.1.1 Price and value remain a fundamental factor in determining food choices, particularly in the current recession. Sales of our discount and value ranges are up by 65% on the year.

5.2.1.2 On a longer-term perspective, consumers are increasingly health conscious, care about local provenance and quality, are looking for convenience and want to contribute towards protecting the environment. It means making healthy choices more accessible through clear labelling, information and promotions.

5.2.1.3 Looking beyond the UK (which could provide growing markets for UK production), rising incomes eg in Asia are leading to increased consumption of meat and dairy products. In the short term this has led to increased demand for grain, which has in turn impacted on food prices in the UK and elsewhere.

5.2.2 By working with our suppliers and building long-term relationships with them we can help them grow and innovate. We have over 1,500 suppliers who have been working with us for five years or more, and many who have been with us for decades. An example is family-run Premier Vegetables in Lincolnshire. They started by supplying 60 trays of cauliflowers a day to our Corby depot in 1983 and now supply us 2.6 million trays of cauliflowers, cabbage and spring greens a year, employing more than 200 people at peak times.

##### 5.3 *R&D*

5.3.1 Research and investment will have a fundamental role to play in delivering the sustainable, competitive and innovative agricultural systems needed to meet the challenge of food security. We share the NFU's concern that there has been a substantial cut in publicly funded agricultural science, in the UK and worldwide, since the 1980s. The lack of public investment in agricultural R&D undermines productivity and innovation.

5.3.2 Tesco is committed to playing its part in investment in research and development. For example we sponsor the Sustainable Consumption Institute at Manchester University, the Dairy Centre of Excellence at Liverpool University and the Oxford University Food Animal Initiative.

5.3.3 However a much more focused and co-ordinated approach to research is needed. It must recognise the interdependencies of different policy areas and the need for outputs to have practical relevance and direct applicability for the supply chain. Areas that would benefit from more R&D include:

5.3.3.1 *Climate change*: reducing the carbon impacts of food production, distribution and consumption.

5.3.3.2 *Sustainable resource use*: water management, land use (sustainable agricultural techniques, land for food versus fuel etc).

5.3.3.3 *Production methods*: improving yields, production efficiencies, organic versus conventional production, reducing input costs.

5.3.3.4 *Disease*: cause, cure and prevention of animal and plant disease.

5.3.3.5 *New technologies*: GM, nanotechnology.

Tesco Plc

March 2009

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### Memorandum submitted by the Food and Drink Federation (SFS 29)

#### EXECUTIVE SUMMARY

- Food security is a complex issue, involving a chain of production and distribution. Consumers also need enough purchasing power to buy what they need.
- Food security in the UK is intrinsically linked to the health of the whole supply chain—farmers, processors and retailers. UK food and drink manufacturers buy some 2/3 of the UK's agricultural output. Without this processing capacity UK farmers would not have a market, now or in the future. We also rely on international trade for the choice and variety of diet and year round availability that UK consumers currently demand.
- The longer term balance of supply and demand is a global challenge. Climate change introduces whole new areas of uncertainty to a set of existing risks, which already include pressure on energy and water supplies vital to feeding the nation on a day to day basis.
- Managing and mitigating these risks will require integrated policies which prioritise food security as an objective in its own right, particularly in the regulatory area. We also need to maintain and enhance knowledge and skills to provide flexibility, innovation and resilience to make the most of what we have, now and in the future.
- The UK food and drink industry currently provides a wider range of affordable and wholesome food to more people than at any time in our history. We need to build on these strengths through a clear and shared strategic framework to help Government and industry avoid short term difficulties and the risks of market failure eroding critical mass and undermining the further capabilities we need to develop.

#### INTRODUCTION

1. The Food and Drink Federation (FDF) represents the UK's food and drink industry, the country's largest manufacturing sector. The industry directly employs around 440,000 people, widely dispersed across the country in 7,000 companies of all sizes, and more than twice that number in a range of ancillary services. It has a turnover of £72.6 billion, produces a gross added value of about £21.6 billion a year and is a key partner of British agriculture and aquaculture—buying approximately two-thirds of what our farmers produce. Consumer spending on food and non-alcoholic drink amounts to some £129 billion a year. The industry is also a major player in international trade—and we export some £7.5 billion worth of food and non-alcoholic beverages a year, mainly to Europe.

2. Issues related to food security are highly relevant to the industry's own interests and to the role it plays in providing safe, nutritious, varied and affordable products for consumers, in the UK and elsewhere. Moreover, following the progressive disposal of Government-held stocks, the industry's own storage facilities (together with those of the retail supply chain) now constitute the nation's strategic reserves in the event of civil or other emergency.

3. The industry is very aware of the potential impact of climate and demographic change, environmental degradation and possible shortages of fossil fuels and water—at both national and global level. That is why it is increasingly engaging with efforts to reduce its carbon footprint and to promote increased efficiency of resource use, for example through the FDF's Fivefold Environmental Ambition, which sets targets for cutting CO<sub>2</sub> emissions, reducing water use and transport miles, minimising packaging and sending zero waste to landfill.

4. The FDF is keen to assist the Committee with its inquiry and offers the following responses to the questions posed.

#### *How robust is the current UK food system?*

5. Assessing the robustness of the UK's current food system depends on how food security is defined. There are many different approaches, but most involve physical and economic access to sufficient safe and nutritious food combined with supporting active and healthy life. The level of national self-sufficiency for particular foods has a role to play, but is not itself a determining factor.

6. On these broad criteria, the UK currently enjoys high levels of food security and arguably a wider range of affordable and wholesome food available to more people than at any time in our history. With rare exceptions, shops are fully stocked at all times. Even 20 or 30 years ago, seasonality would have affected the range of foods on offer. But improved access to world markets and advances in agronomy mean that most products are now available all year round. The efficiency of the manufacturing sector and supply chain is another key factor, as few foods are grown and consumed locally without some form of processing.

7. Likely risks to short term supply centre on issues relating to transport, energy and other forms of civil contingency, rather than on the availability of food as such. Maintaining fuel supplies is critical for both manufacturing and primary production. Recent experience suggests that the UK food system is relatively robust in the face of brief or localised disruption, though prices did increase significantly in response to world conditions in 2007–08. Prolonged or more widespread disruption, particularly to supplies of energy or clean water, would undoubtedly pose a major challenge and require direct Government intervention in support of the industry's own efforts. But, depending on the availability of unaffected imported supplies, it ought to be possible to avoid widespread food shortages.

8. By way of comparison, it is worth noting that adequate food supplies were largely maintained throughout the Second World War, though there were major adjustments to what was available, where it came from and how it was produced.

9. Public perception of what constitutes an acceptable level of supply is also likely to change in response to the severity of any emergency and who is seen as responsible. Shortages outside obvious national control (such as those resulting from major weather events or disasters) are more likely to be tolerated than those arising from failures in infrastructure or poor commercial or public policy decisions.

10. Common to all such disruptions to supply, however, is the extent to which the identification, assessment and management of risk can mitigate their worst effects. The food and drink industries have a long and good record of cooperating with Government and its agencies in these areas. But modern supply chains keep physical stocks to a minimum to save cost. This increases vulnerability and dependence on logistical systems to ensure needs are met. Small failures can have disproportionate consequences in such circumstances.

11. In the longer term there is now established consensus that we face a different set of risks relating to the basic balance of supply and demand. World population is expected to grow by 50% by 2050 and demand for food to double. Increased prosperity will also accentuate competition for resources as more people enjoy higher protein diets. Renewable energy needs may also impact on water use and food crop production. Policies aimed at developing biofuels need to take proper account of food security concerns.

12. At the same time, climate change is likely to reduce available agricultural land and increase harvest volatility. Shortages of energy and water may further reduce output. Mass migrations may compound other changes in patterns of production and trade. Even if some of these impacts may be less extreme in the UK, we will inevitably be affected as part of the global economy.

13. The ability of political, economic and market forces to cope with these challenges remains unknown. Nor is it clear how linear these processes might be, or when tipping points might occur. Risk management will again be vital, as will the extent to which people are prepared to modify their expectations in the light of changing circumstances.

#### *What are its main strengths?*

14. The current UK food system is as strong, diverse and competitive as any in the world. It has a good record of innovation and meets high standards of quality and safety, beyond regulatory requirements. But continued profitability and investment will be essential to maintaining and improving this. Food and drink businesses are as dependent as any others on levels of consumer spending, interest and exchange rates, the availability of credit and their ability to attract and employ sufficient numbers of sufficiently skilled staff.

15. Another key factor is the industry's ability to buy efficiently from EU and wider world markets to improve the range of products on offer and complement its use of home-grown raw materials. A variety of suppliers is also inherently more robust than reliance on single sources.

#### *And weaknesses?*

16. As already noted, the industry is heavily reliant on energy and water supplies and also on a range of other ancillary inputs such as packaging. In general the more sophisticated the product, the more vulnerable it is to interruptions in essential inputs. In the short to medium term, energy security and water security are probably more relevant to UK food security than the industry's ability to source raw material supplies in what is still a relatively abundant world market for primary agricultural and fisheries production. In the longer term, and depending critically on climatic, socio-economic and political conditions elsewhere in the world, the ability to source and transform sufficient staple foods within the UK is likely to become increasingly important.

17. Maintaining sufficient productive capacity in both domestic agriculture (and fisheries) and in our own processing industries needs to be given appropriate strategic priority, as market forces alone will not necessarily guarantee the continuity required. This needs to extend to regulatory and other decisions affecting the context in which the food chain operates, in order to ensure that there is an appropriate balance between long term resilience and more immediate policy requirements. National standards in areas like animal welfare or food safety which go beyond those applied elsewhere may also adversely affect the relative competitiveness of UK producers. Maintaining a level playing field may involve difficult compromises e.g. in relation to pesticide use or planning consents.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

18. The UK food and drink manufacturing industry already provides a market for over two thirds of the UK's agricultural production. Maintaining a strong domestically based processing sector will be vital to exploiting any increase in output should climate change improve the UK's comparative advantage in temperate products. The ability to process close to sources of production is also likely to be inherently more sustainable than transporting bulk materials over large distances. Maintaining a critical mass of manufacturing capacity in the UK will be essential to maximising these opportunities. Access to the relevant technology and R&D specific to UK circumstances are other necessary conditions along with the ability to make appropriate capital investments. This requires a sufficiently stable long term framework for business and one which looks at the totality of issues, including regulation, training and an appropriate UK science base.

19. The industry also adds value to a range of imported supplies using the skills it has developed, in areas like preserving nutritional value, improving shelf-life and minimising waste. UK companies are well placed to make less food go further and get maximum benefit from it, including the development of new uses for by-products and ways of conserving and recycling resources used in production. Driving the efficiency of resource use is one of FDF's key aims and vital to both sustainability and competitiveness. FDF is keen to work with Government on these issues. Continued profitability is essential to providing the platform for future expansion. Attempting to regenerate capacity or re-acquire expertise may not only be disproportionately expensive, but may also simply not be possible in the then prevailing circumstances.

*What are the challenges the UK faces in relation to the following aspects of the supply side of the food system?*

#### *Soil quality*

20. The UK has a long history of cultivation and industrialisation. It is also relatively densely populated. Most land suitable for agriculture has already been identified and improved and some has already been lost to competing land uses. In these circumstances, conserving soil quality has to be a high priority, not least because of its close links to water issues. Good nutrient management and proper control of other chemical inputs is essential to both. In terms of food security, the challenge is to balance the maintenance of future productive potential with meeting current needs. This requires a proportionate regulatory framework within a longer term land use policy, which recognises food production as a strategic priority and also takes account of environmental and biodiversity concerns, including the role of soil in the carbon and nitrogen cycles.

#### *Water availability*

21. Achieving significant reductions in use to help reduce stress on the UK's water supplies is already one of FDF's Environmental Ambitions. The same challenge applies to agriculture, other industries and to domestic consumers. Water shortages which inhibit production in the UK will lead to increased reliance on imported food supplies, which in an era of scarcity would almost inevitably lead to higher economic cost. So timely action to promote efficiency of water use and increase availability is a form of spend to save, as well as helping to promote wider food security. Market signals are still very weak in this area, particularly in relation to the longer term benefits. But simply increasing the cost of water to users in the short term risks distorting markets and moving both food production and food processing to countries not following similar policies.

#### *The marine environment*

22. Properly managed fisheries have the potential to provide enormous benefit to the nation's food supply, particularly in nutritional terms. Marine fisheries require no inputs other than the energy involved in capture. And responsibly fished stocks are effectively a renewable resource. The UK is particularly well placed to exploit these opportunities, provided that sufficient base capacity can be maintained while improved conservation and stewardship policies take effect. Aquaculture also has the potential to make a significant contribution to food security alongside sea fisheries.

23. But, as in the case of agricultural land, there are increasing issues of spatial planning in relation to the maritime environment, in relation to a range of competing uses, other than food production. The oceans also have a key, but relatively poorly understood, role in relation to climate change and the carbon cycle. Research into these issues is even more subject to market failure than in the case of land-based equivalents, because questions of ownership are much less well defined. The integration of policies relating to the marine environment—and the funding of adequate research to support them—is therefore primarily a task for government, at national and international level. The history of cooperation and success in these areas is not good and achieving the required step change in performance is itself a major challenge.

#### *The science base*

24. The need for relevant expertise appropriate to UK conditions is a consistent theme in many of the above responses. Another is the need for innovation and flexibility to able to respond to a range of possible circumstances. Both the degrees of uncertainty involved in many of these issues and their probable timescales make many of them inappropriate for industry funding in a normal commercial or near market context. Ongoing research and development is essential in order to meet these challenges. In addition the industry needs a consistent flow of good food scientists and technologists. In recent years, public funding for agricultural and food science has been reduced. Reversing this is probably the single area where government can make the most immediate and direct impact.

#### *The provision of training*

25. Training is another aspect of the knowledge and skills base which it is essential for the UK to maintain and enhance. Industry clearly has a lead role in this, alongside educational providers. But again there are issues of profitability and market failure which may prevent companies adopting the best long term strategies, particularly in current trading conditions.

#### *Trade barriers*

26. Notwithstanding the potential for an increased role for domestic supply in response to longer term threats to food security, imports of food (as raw materials, semi-processed and finished products) have made a major contribution to UK food supplies since the industrial revolution. Diversity of sources is also another key feature of resilience in the supply chain. It is therefore a high priority for the UK to maintain and improve access to global markets and also to maximise its own export potential. The key to this is a genuinely open international trading system. The FDF fully supports efforts to achieve multilateral trade liberalisation and the role of the WTO in enforcing a rules-based international system where the use of subsidies is restricted to non-distorting measures. We see this as an important element of helping to balance global supply and demand in years to come.

#### *The way in which land is farmed and managed*

27. Beyond the points above relating to soil, water and the need for a longer term strategy for land use, the FDF has no particular comments on the way land in the UK is farmed and managed, other than that consumers need to be able to have confidence in the quality and traceability of products and that necessary regulatory requirements have been met.

#### *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

28. There seems to be a disjunction between attempting to analyse emerging trends in consumer tastes and habits and assessing the prospects for securing food supplies in an increasingly uncertain future. Although there is growing public awareness of climate change and its possible consequences, there is little evidence to date of this having any material effect on patterns of current consumption. As noted earlier, the range and diversity of food and drink products available in the UK is probably greater than ever before and there are no signs that consumers wish this to be restricted in future. There is evidence of a more direct link between disposable income and choice, suggesting that consumption responds more readily to price signals than to any wider concerns about the impact of production on the environment or the sustainability of food supplies in general.

29. There is also a growing debate about diet and health. This will also affect consumer choices and the way manufacturers formulate products. But it is difficult to predict the effect on aggregate demand. More use of fresh produce and localised sourcing may affect some processing sectors. But it is similarly difficult to assess the implications of this, including for food safety in respect of storage and production standards.

30. Consumers are also increasingly interested in how their food is produced and the quality, technical and ethical standards involved (e.g. in relation to both animal welfare and human labour). There is also caution over the need for and safety of new developments e.g. in relation to additives, nanotechnology and GM. Responding to these concerns requires a careful balance on the part of industry and its regulators. Meeting higher demand from fewer resources in future will inevitably require smarter solutions and technology has an enormous contribution to make to this.

*The role and effectiveness of Defra*

31. As recognised in the Government's "Food Matters" report, a successful food strategy must include affordable access to necessary supplies, fair terms of trade and competition, a proportionate regulatory framework and coherence with wider policies on health and the environment. The challenges of food security extend further into issues of energy and water supply and the impact of climate change on global supply and demand. This agenda—and associated evidence and research needs to be integrated into a coherent cross-government policy framework. FDF notes that Defra has recently been given an enhanced role in relation to food and is awaiting details of what this will mean in practice. However we have some concerns that it appears to be primarily directed to co-ordination of the plethora of existing activities and players rather than the strategic leadership and clear prioritization of sometimes competing policy priorities which is essential.

32. Apart from Defra, FDF deals regularly with BERR, Department of Health, DECC, DfT, DfID, Treasury and Cabinet Office, with FSA and a range of other agencies and public bodies and with devolved administrations and local government structures—often on different aspects of the same issues. FDF engages similarly with a range of EU institutions, to complement the efforts of Defra and others in pursuit of UK interests. FDF would like to see a consistent and coherent view of food policy issues within Government, with a clear focal point for engagement with industry and a shared commitment to proportionate, evidence-based regulation. With so many decisions taken at EU level, particularly in the regulatory area, it is essential that the UK promotes such an approach within the EU, taking account also of the wider world picture.

*What criteria can be used to monitor how well the UK is responding to the challenge of increasing food production while ensuring sustainability?*

33. A key element of this has to be the efficiency of resource use, in terms of energy, water, carbon and other greenhouse gas emissions. The way food production impacts on the environment and the way it is affected by climate change are other important factors. Absolute levels of output or changes in self-sufficiency ratios are not good indicators of success, as they ignore the externalities which are such an important component of sustainability. The cost of production is also relevant as the UK has to operate in global markets. FDF would be happy to contribute to further thinking on these issues.

January 2009

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**Memorandum submitted by Unilever (SFS 58)**

INTRODUCTION

1. In December 2008 Unilever was contacted to provide written and oral evidence to the EFRA Select Committee inquiry on "*Securing Food Supplies up to 2050: The Challenges for the UK*".

2. We are pleased to provide evidence to the Select Committee and present our views on a number of questions which have been raised. Our main focus is on the question of how well placed the UK is to make the most of its opportunities to respond to the challenge of increasing global food production by 50% by 2030 (and doubling it by 2050) while ensuring that such production is "sustainable".

3. It should be noted that Unilever has also provided input to the written submission made by the UK Food and Drink Federation (FDF). We therefore limit our responses to a number of key questions in addition to the evidence provided by FDF.

*How to use the UK potential to increase production in a sustainable way?*

4. In 2006 the UK imports of food and drink products amounted to £25 billion with exports of some £10.5 billion. The difference between imports and exports has doubled between 1995 and 2005. Depending on the definition used the UK now imports between 40% and 50% of its food supply. The UK is therefore increasingly dependent on food imports.



5. For the period 2010–2030 it is expected that the UK population (now 60 million) will increase with another 10 million people. For the same period we may expect certain changes in the diets and additional demand of healthy foods.

6. We believe that the development at global level and in the UK would merit a strong focus on the potential to increase domestic production in a sustainable way. This may require action at the level of individual sectors (including fruit and vegetables).

7. The issue of food security has received a substantial amount of political attention recently. This, together with an active participation of key stakeholders, could result in the necessary improvements in future food production capacity. This could answer the question whether it will be possible to increase food/feed production by 50% in the UK in a sustainable way and whether the UK would be in a position to contribute in a proportional way to the additional global food production.

8. In this context it can be argued that Europe and the UK will not be constrained dramatically by climate change compared to Africa. Agricultural production, however, will have to meet sustainability requirements including water and energy use, climate change emission objectives while respecting biodiversity and ecosystems. You can find the Unilever Sustainable Agriculture programme via the link: ([http://www.unilever.com/Images/es\\_Growing\\_for\\_the\\_Future\\_3rd\\_Ed\\_tcm181-27805.pdf](http://www.unilever.com/Images/es_Growing_for_the_Future_3rd_Ed_tcm181-27805.pdf)).

9. The possibilities for production and yield increases will have to be assessed on a crop-by-crop basis. As Unilever we are interested in a number of crops including oilseed rape for food production and fruit and vegetables. We would like to see a specific emphasis on the quality of the production. This should take into account the future demand for healthy foods.

10. Targeted investments in infrastructure, research and innovation would facilitate the expansion of agricultural production and productivity improvement. This should include water management, transport infrastructure as well as food storage.

#### *Food Security versus Energy Security?*

11. Unilever remains concerned that certain national policy measures to promote the use of biofuels are distorting commodity markets and increase pressure on the available food supply. In our view we need to develop alternative sources for renewable energy for electricity and transport fuels in the UK and the EU which do not compete with the required food supply.

#### *How to manage the transition process in the UK?*

12. We expect the UK Government to facilitate investments in agricultural production with the objective to increase yields and production for food in the period 2010–30. The use of EU funds and national supplements could be organised in a way to obtain a successful transition. The criteria need to include the respective sustainability criteria with a specific focus on production/yield increase.

13. Concerning the science-base and the provision of training, it would be adequate to review the role of public and private organisations in this area. We believe that public-private partnerships could be an effective way forward to stimulate increased production of specific crops in specific regions. A specific focus on added value produce could serve the future demand as well as the revenues for primary producers.

14. A specific area of attention would be risk management. Investments to mitigate the risks associated with agricultural production will strengthen the financial capacity to invest in agricultural production. Insurance against droughts and floods as well as monetary and commodity market instruments all play a role in this context.

15. Considering the age profile of the agricultural labour force in the UK (average age: 58 with 30% over 65 and only 3% under 35), it is recommended to reassess the consequences of this for the future of agricultural production. Measures applied elsewhere in the EU could be considered in order to improve the training, recruitment and retention of talent in the UK.

#### *How to engage with European and international bodies on food policy?*

16. In recent years the UK Government played an important role in putting food security on the international agenda. Further activities in the UN including FAO would merit from active UK involvement. Within the EU we will be engaged in a policy debate about the Common Agricultural Policy post 2013. A well functioning internal market and the elimination of trade barriers with third countries would allow for an efficient trade regime which reduces costs in the different supply chains.

17. In developing countries we need more partnerships to reduce inefficiencies in the supply chain between the farm and the plate. The question of supporting innovation will raise the issue of biotechnology in order to produce more drought and resistant crops and increase productivity.

18. At the same time we need to examine and develop recommendations to engage smallholder farmers to increase agricultural productivity as well as poverty alleviation. Smallholder farms have an important role to play in meeting domestic food security objectives in developing and emerging economies. Access to credits and access to inputs and consumer markets are critical issues in this context.

January 2009

*Witnesses:* **Ms Melanie Leech**, Director General, Food and Drink Federation, **Mr Andrew Kuyk**, Director of Sustainability and Competitiveness, Food and Drink Federation, and **Mr Willem-Jan Laan**, Director, Global External Affairs, Unilever, gave evidence.

**Chairman:** I formally welcome from Unilever Mr Willem-Jan Laan, director of global external affairs, and from the Food and Drink Federation Melanie Leech, director general, and Mr Andrew Kuyk, director of sustainability and competitiveness. I think we know Mr Kuyk in another guise but he has now moved to a new one. We hope that he will be happy in his position at the Food and Drink Federation and will make a very important contribution to its work. I should like to start off the questions with Roger Williams.

**Q244 Mr Williams:** I do not know whether you have heard some of the exchanges this afternoon. As far as Unilever is concerned, to what extent are you satisfied that DEFRA's performance as a department within government is responsible for championing the food and drink industry?

**Mr Laan:** Our experience with DEFRA has been in a number of areas. It gives me pleasure to appear before the Committee today as a Dutchman working for Unilever and provide evidence from our perspective on the food security agenda. For specific UK questions I am happy to be in the company of the Food and Drink Federation which no doubt will be able to add information. In a number of areas we have had experience with DEFRA. In the committee on the long-term research agenda we had experience with activities on sustainable agriculture where we shared information and also on things like avian 'flu and other food safety issues. Overall we have noted that currently DEFRA is the lead department for foods. In the past maybe it has been a bit inward-looking. Outside the UK you would not meet DEFRA people often. Obviously, there were other departments, for example DFID and others. Last year at the food summit in Rome I participated in two panels and met UK colleagues. Overall, we hope that DEFRA will take up the responsibilities on the whole food chain including the food industry. With regard to the international context we believe that food security is an issue of a European and global nature and DEFRA also has a role to play in that area.

**Ms Leech:** If I may expand that on behalf of a cross-section of the industry, I think DEFRA would recognise that in recent years it has not felt the need to prioritise and focus on food issues. To some extent that means the industry has probably been a victim of its own success; it has been rather good at delivering cheap, safe and nutritious food at affordable prices to households. DEFRA has let it get on with it. For DEFRA the focus has been much more on agricultural issues but also environmental

ones and, alongside other parts of government, it has tended to see the food chain and food industry collectively as a delivery tool for various social policy objectives—clearly, we are an important delivery tool for some of those objectives—and perhaps has put to the back of its mind the remembrance that in order to have a tool to deliver things there is a need to do what is necessary to keep it in good shape. We hope that as DEFRA's new leadership role around food takes shape that will be at the forefront of Hilary Benn's mind. I think he is saying the right things about being committed to that, but it is really about championing the industry, remembering that in order to have a thriving, vibrant and successful industry you must create the right framework for it. If not, it will not be there to deliver the other things that you might want.

**Q245 Mr Williams:** You said that DEFRA realised that it needed to take on the role of leadership. Are there any specific areas of food policy development where it could or should be particularly active?

**Mr Laan:** I see basically two areas. The first area is sustainable production and domestic production in the UK. We are happy to contribute by considering our own sustainable agriculture programme which we have had for a long period of time. Second, if you need to double food production between now and 2050 you may need to invest in research and development. I think that increasing yields and new varieties by using the best options available for production for the longer-term perspective is also a matter on the UK's research and development agenda, but also the work in partnership with the private sector can be of real importance. To give a little background, I am from Holland. We view public/private partnerships on education and research together. We built a food valley around the University of Wageningen where I studied and that is already paying dividends. If you think of the future agenda, how to work in partnership with a clear research and development agenda is something to be considered.

**Q246 Mr Williams:** You said you had not seen representatives of DEFRA perhaps outside this country making a contribution to food security or supplies. Do you think that within this country communications between DEFRA and the food industry are all that they should be, or could there be improvements in those areas as well?

**Mr Laan:** I have noted that the Council of Food Policy advisers has been installed. We expect that council to contribute to the activities of DEFRA in

25 February 2009 Ms Melanie Leech, Mr Andrew Kuyk and Mr Willem-Jan Laan

this area, so we have some confidence in the initiative. At the same time, as we said in our written submission we have noted that the focus on increasing production and the capacity of production in the UK until recently was not at the top of the agenda. Having worked for a ministry of agriculture myself in the past, I think you would expect also a domestic agenda. Yes, the initiatives do work out globally and the bridge which is available through DFID for global initiatives to improve the food situation is welcome and should be pursued, but also I think your own contribution counts in this area.

**Ms Leech:** We have a very good level of dialogue with DEFRA. Like the witness before me, I am a former civil servant. My perception is that knowledge and understanding of the industry is diminished in DEFRA compared with the past. Perhaps that is because I wear rose-tinted spectacles and think of a past that never really existed, but DEFRA officials are busy all the time which means that one of the things that falls off the bottom of the list very quickly is getting out and about, seeing industry in the raw and understanding the process and all of that piece. That is a shame because it makes it harder to make good policy. There is a good level of debate and dialogue. We see DEFRA officials every week and within my team every day, but what does it lead to? What difference does it make ultimately? Some research was done among some senior manufacturing executives last year. If you look at what is at the top of their list in terms of risk and weakness it is over-regulation and inconsistency of policy application across government and legislation being introduced prematurely or legislation that is not properly science-based. I talk to DEFRA about these things. The question is whether it makes any difference in terms of getting greater consistency across government and a better approach to regulation that the previous witness also talked about.

**Q247 Chairman:** Mr Laan, you said that near the university where you studied a food valley had been opened up. What is in it?

**Mr Laan:** The documentation is probably freely available. What is in it? It contains the education and research parts of the university. It contains a top food institute founded by the food industry and the government. The government is now taking over that role, so it has a specific programme for that part. The industry now has the so-called food delta programme which is a joint activity with the food industry. On top of that there is a whole society or network which basically is called the food valley where people interact on a weekly basis about research, science, education and innovation successes. All in all, it is probably a concept where food production and research are taken seriously by the partners who have long-term commitments which include funding.

**Q248 Chairman:** You touched briefly on the FAO meeting in Rome in June last year. Both organisations laid out over two days some of the key

elements of the challenge as they saw it towards food security; in other words, there was an issue and the world needed an agenda to address it. Do you recognise it as an issue as such? Do you agree that we are now moving into an era where we need to think much more carefully about how we will have long-term security of food supply? In that context, although we have talked about the United Kingdom mechanisms one of the things that politics does not do very well is long term, yet to address some of those challenges is a very long-term issue. I am asking a general question to try to explore whether we have put in place the necessary international and national mechanisms if both of you recognise the issue of food security as a real one to be addressed. Therefore, do we have in place the right policy mechanisms to sustain the work that needs to be done to address the issues we have been discussing over a 20 to 50-year timescale?

**Mr Laan:** Firstly, if you look at the World Bank and other international organisations you see that agriculture is back on the agenda. It came out with a specific report on agricultural production. It doubled its own budget outlays on agriculture. The summit in Rome basically did bring together organisations on a global scale. The UN also has a follow-up commitment to have an active programme which involves the secretary general himself. Security is certainly on the agenda; it was in 2008 and it still is. These organisations have noticed that the fall in prices due to the financial crisis and recession is probably not as structural as the underlying elements such as increased population, changes in diet and the whole supply and demand situation in agriculture. For the UK domestic situation—I will come to the policy measures to which you refer—what we see is that not only DEFRA but the Cabinet Office, Chatham House and others—Professor Lang to mention just one—have done a lot of work in this area recently. I think that food security is seriously on the agenda. The various elements are known: declining productivity; the impact of climate change; limitations set by biodiversity; water and so on. This is apparently the period when we reassess the situation in food supply at a global level. We as a company with our sustainable agriculture programme and commitment on water and activities on climate change are serious about these challenges. We believe that in a lot of our markets these will be determining factors in the coming period.

**Ms Leech:** I agree with that. These are global issues which have to be tackled at that level. A lot of the right mechanisms are in place but they do not always work as well as they might and need to do. If you look at trading issues and the moves around climate change the mechanisms, engagement and commitment are there but things move arguably too slowly. I think that given the current economic challenges there is a risk that the trend to take the foot off the accelerator will continue and new countervailing measures may come into play. I think that all of us need to be aware of that and do what we can to mitigate those risks. As an industry we need to press government to be brave about not falling into

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25 February 2009 Ms Melanie Leech, Mr Andrew Kuyk and Mr Willem-Jan Laan

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that trap. The hierarchy builds down from tackling it at that global level through to EU level and the domestic level. We need to make sure that all the short-term measures and everyday decisions taken by government ultimately align within a long-term vision and strategy that must be owned globally.

**Mr Kuyk:** Obviously, the EU is an extremely powerful potential player in this debate. From my own recent experience prior to joining FDF I think there are still some tensions and divisions within the Commission, notably between DG Environment and DG Agri. For example, in the negotiation in which I was personally involved on the Soil Framework Directive there were a number of unresolved issues between the two parts of the commission. In some senses I think that DEFRA is slightly ahead of the game in that it brought those kinds of policy discussions under a single roof within the department. I believe that was a very useful way to try to resolve some of these issues. I was struck by the fact that in his evidence Professor Lang said that perhaps instead of having a common agricultural policy Europe needed a common sustainable food policy. There is something in that. When I spoke to Mr Laan before this session he said that in terms of the European public debate food security had not really registered as a substantive issue. Therefore, there is a lot more that the EU could do. Again, at the level of regulation and potential intervention we are talking about it needs to be done at the EU level. There are limits to what the UK could do even if it was as joined up in its thinking as it ought to be. I think that we still have a little way to go on that.

**Q249 Chairman:** Perhaps we may explore the area of risks to the supply of food. From the UK consumer's point of view I suppose that the risk is whether it will be there tomorrow or whether one can afford to buy it. If you look at the challenges, we have talked about climate change, water, technology and other key factors. When a company like Unilever looks to the long term—I was very interested to read the document "Growing for the Future" which shows the global nature of your business—and the range of crops and locations from which it draws products to keep its food factories going, in what areas do you identify a real risk if it is not addressed? What is on the Unilever Richter scale which says that if you do not deal with something you may be in deep trouble?

**Mr Laan:** Our sustainable agriculture programme is put in place in order to ensure that we are as proactive in this area as possible and that our supplies produced in a sustainable way are accessible to us as a food industry. That is an active programme. We started with our key crops and later we rolled it out to others. As to water, that is certainly one of the issues. That is within the indicators we use in our sustainable programme. We also see other new challenges that will become more relevant in future. I mention competing claims for biofuels. That is something about which we are worried. Climate change and changes in agricultural productivity due to climate change could have an impact on the production capacity of several

countries and could change the availability of raw material for our business. In tropical areas we are very close to biodiversity questions. Tropical forests play an important role. For us it is relevant to make sure that our production will originate from sustainable sources without negative impacts on biodiversity and tropical forests. These are a number of areas in our programme, but it has been installed because we want to be sure that the raw materials produced in a sustainable way are secure in future.

**Q250 Chairman:** From the FDF perspective what are the key risk areas that you and your members are looking at?

**Ms Leech:** It is very similar. It will vary somewhat from sector to sector depending on the core of your business, but they are very similar issues. We are very good as an industry and as a food chain at managing known risk and short-term interruptions in supply as they occur. That is because we have invested a lot in being able to do that. I guess that what keeps a lot of my members awake at night and is much harder to plan for is the unknown risk. For some things we just do not know what the scenario will be. You get into some of the work that Chatham House has been doing around different scenarios and trying to plan for them and on top of that you place political considerations and other uncertainties. I am in danger of becoming an American politician, am I not? There are unknown unknowns. More than ever there is greater volatility in the system than people would have been used to dealing with even a short time ago. That creates new sets of challenges which require new skills from business leaders and that point is probably not unique to the food industry.

**Q251 Chairman:** That leads us quite neatly to an area on which we touched with our earlier witness. When the unknown unknowns pop up and cause a major disruption to basic commodities in the supply chain how should we in our complex western society respond to that? Should we be going back to the days of large-scale strategic stocks or find some other cleverer method of dealing with supply chain disruption? What would be your recommendation about how to improve our situation? One thing that struck me when looking at some of the material was how little stock of basic grain the world had. I think that in recent times we were reduced to about 50-odd days' supply. That does not give you long to do something about it if you have a catastrophic crop failure somewhere. How should we deal with these unknown unknowns?

**Ms Leech:** I think we are quite good at doing it on a short-term basis. Rice was a good example last year. We had some challenges in the supply chain and we had to react to that quickly. I think that on a short-term basis the food chain is good at doing that. If we come back to the role of government in setting a long-term vision and strategic framework, I think the challenge is to see a clear trend emerging that points to the fact that over a period of time consistently environmental or other changes will lead to a position where a commodity that we now take pretty much for granted, rightly or wrongly, will

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 25 February 2009 Ms Melanie Leech, Mr Andrew Kuyk and Mr Willem-Jan Laan
 

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no longer be available to us or will look very different and will create all sorts of challenges about how it is produced. Those are the kinds of big strategic threats and possibly lost opportunities on which we need to work together.

**Q252 Chairman:** I would be interested to know your view on whether in this context we should be saying that from the UK point of view external risks might increase. Therefore, should we play to our natural advantage because we have good soils, a moderate climate and reasonably good rainfall? We could produce agriculturally a lot more than we do. On the other hand, up to now the policy has been to rely on trading relationships with other parts of the world and diversity in the range of materials to which we have access. Given the risks that we face and even some of the unknown unknowns, should we move to a strategy where we encourage more domestic production because it gives us a bit more control or improve in some shape or form our trading relationships because that gives us a get-out-of-jail-free card?

**Ms Leech:** I do not think it is an either/or; you have to do both. You must ensure that your trading relationships are robust and that the system is as open as it can be, but it also behoves everybody to take advantage of their natural position in the globe, so where it makes sense because it is sustainable—it is no good taking advantage of our good soil quality if we erode it to the extent it is no longer good in 10 years' time—and commercially viable to do so we should be seeking to maximise our own ability to produce, but that is not a substitute or an either or as against making sure we have robust trading relationships and open markets so that globally we can flex the food system to feed people.

**Mr Kuyk:** It is easy to confuse short-term and long-term risks; they are of a different nature. I very much endorse what Ms Leech said. By all means exploit our productive potential in this country provided it is taking a comparative advantage and it is done in a sustainable way. But on your more cataclysmic scenario, for example a major problem with a crop, that could happen in the UK; we could have a new disease of wheat that wiped out the UK wheat crop. Therefore, if we refocus solely on domestic production and ignore the external trade dimension that cataclysmic event could be on our own doorstep. Therefore, it is not an either/or. As Ms Leech and the previous witness said, horizon-scanning, risk mitigation and picking up trends early on are all very important parts of it, but any business will say that diversity of supply and potential resource is the key to resilience in those circumstances, so I think we need all those things.

**Mr Laan:** Your question takes me to a response from the private chains but also public policy measures. On the private side, experience last year in particular triggered new contacts with suppliers about how to deal with shortages, serious price increases and so on. Therefore, there is an inclination to have longer-term relations to make sure that in the years to come there is a guaranteed supply of raw materials. On top of the scrutiny of suppliers to make sure that you

have a robust supply chain in place certain elements are added. As to government measures, what we have seen at European level is that we have taken away the set aside scheme because we have a shortage of supply. For a certain period we phased out the import duties for cereals and other crops. We got rid of the energy crop premium. Individual governments scaled down on biofuel targets because together they said this was not a situation they wanted to be in. You could argue that some of these reactions were a bit late in the day. Nevertheless, they happened and those measures had an impact. For private and public together we want to be in a situation where we have communication about these measures so that if we want them to be taken we articulate them through associations like FDF or European associations that something needs to change in order to improve the availability of raw material.

**Q253 Chairman:** Perhaps I may ask a question about the two big global targets that emerged from Rome. All of us have now adopted them as part of our standard language in discussing these matters, but do either of your organisations have any doubts that the targets themselves are a fair assessment of the future world food supply needs?

**Mr Laan:** In principle it is right to set targets for governments and the millennium development goals were again endorsed in Rome. No doubt additional targets on climate change and so on will be added. The point is: can we deliver on these targets? Can we formulate active programmes? It strikes me that both on food security and climate change the political debate in the UK is ongoing. I think that a kind of leading voice is heard from the UK on both food security and climate change and the combination of the two. Can we deliver? Yes. At European level first we have to agree and deliver and then with the other main players we must step up our activities.

**Q254 Chairman:** When you say that we have to deliver at a European level, if you did a mathematical exercise and said that a 50% increase in the world's food supply by 2030 broken down pro rata on the basis of current agricultural areas it would mean that if Europe took its share of the burden it ought to produce  $x$  more. That is a very mechanical way of parcelling out how much we ought to be doing. You could look at it in another way which is to say that we know what the end result is and so what we will do is let the market mechanisms simply sort the job out and that will be okay. To come back to the question of strategic action—you and Mr Kuyk mentioned the European Union—do we have to be proactive in a mechanical, mathematical way and say that we will adopt that big target but break it down and decide how much each member of the European Union should target, or do we take a step back and say that everybody is aware of the problem? If the demand is there the market will cause the supply to rise because prices

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25 February 2009 Ms Melanie Leech, Mr Andrew Kuyk and Mr Willem-Jan Laan

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will go up and so it is all right; we do not need to interfere. Which general route should we take? Should we step back or interfere?

**Mr Laan:** My experience is that often it is a combination of the two. At European level the population increase will play a role. By 2030 the population will not be 50% plus, so you may expect some people to respond by asking whether we really have to increase our food production by 50%. However, this is a global issue and it will be a challenge to increase it by 50% by 2030 and to double it by 2050. I think Europe should play its role in this context. Mr Kuyk spoke about European coherence. I think that food security should be placed somewhat higher on the agenda of the new EU Commission and Parliament than it has been until now to make sure investment in production capacity and policy measures are in place so we increase our fair share of production to meet the total global additional production requirement. We know there are a number of regions outside Europe where potentially production capacity and yields can be increased, so we shall certainly look also at those regions.

**Mr Kuyk:** At the risk of becoming too theoretical, there is an argument for saying that ultimately market forces will do this and it will be efficiency of resource use that achieves it over time, but markets are not perfect and there are lots of disparities. Another key element of food security is affordability and markets will not necessarily take that into account in terms of meeting the food needs of populations. In preparing for this session I was struck by some OECD<sup>3</sup> figures that showed member countries had 50% of the currently available and usable agricultural land in the world but only 20% of the population, so a market solution within OECD countries would not take care of the global problem if there were not purchasing power to access a surplus that is being generated. It must be a combination of both things. The markets can take you so far but they need to operate within frameworks. To come to some of the points that we refer to in our written evidence, that framework is not just an economic one, which is important, but also a regulatory one.

**Q255 Chairman:** I am aware that when the food industry talked about the food crisis the French rubbed their hands and thought what a jolly good idea it was; they could try to hang on to the vestiges of the old CAP and offer public money to try to increase production because it would be a good thing to do, whereas the reform programme as witnessed by the mid-term review and Franz Fischler's earlier reforms have been to move away from support mechanisms which have an effect on primary production. Everybody said that that was the right thing to do, but you say that perhaps we need to walk backwards to that.

**Mr Kuyk:** I hope I did not put it quite like that. You get what you pay for. If you subsidise production of a particular crop you will get that crop. That leaves

out the dimension of sustainability which is vitally important. To go back to the theme of efficiency of resource use, the market will sort that out for you but over time. The timescale over which the market solves that may not coincide with either the demographic or political events that take place in the mean time. I think you must have a framework which is a subtle combination. We are not talking here about either/ors but perhaps the correction of certain trends and establishing the right strategic framework where rational decisions can be taken, "rational" meaning what in economic and resource use terms will ultimately deliver the right solutions.

**Q256 David Taylor:** I am sure that the combination of the market and strategy is right, but how far are we towards getting that strategic framework?

**Mr Kuyk:** It is a bit hard to give a succinct answer to that. We are certainly not there yet and it is perhaps one of those things that we recognise when we see it.

**Q257 David Taylor:** That is what I am worrying about. We might be waiting a long time.

**Mr Kuyk:** I think we are all agreed that this is something that needs to move up everybody's agenda and be addressed with rather more urgency than perhaps it has been in the recent past. Some of the external events in recent months have served as a form of wake-up call. There is a process under way. Certainly, the Food and Drink Federation and food companies are very keen to be involved in that process of discussion as strategic partners.

**Q258 David Taylor:** But there is a framework, the WTO, in which the market operates. We have been discussing the Doha round for years and it does not give me a lot of confidence.

**Mr Kuyk:** I am not sure that is a question you should address to the Food and Drink Federation. There are other more important players in that debate.

**Q259 David Taylor:** I just make the point that it is all very well to talk about frameworks but they seem to me to be far away in the distance and I am not confident that either the private sector or governmental sector are well enough advanced at the moment to develop something that needs to be both national and, more particularly, international.

**Mr Kuyk:** Dare I say that on the governmental side it comes down to political will? If there is political will to address the Doha round or other strategic initiatives that must be not just at a UK level but at an EU and international level.

**Mr Laan:** If we are to double food production by 2050 we believe we need to increase investment in agricultural production. We may need to double our investment in research, development, new varieties, best practices and sustainable methods. We may also have to double our commitment to deliver on the promises and the reports. We have had statements in Rome; we have a lot of reports, but for us the real challenge is: how can we organise ourselves even in difficult economic times to deliver on these longer-term objectives? If meetings where the UK government participates—no doubt there will be a

<sup>3</sup> Organisation for Economic Co-operations and Development.

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 25 February 2009 Ms Melanie Leech, Mr Andrew Kuyk and Mr Willem-Jan Laan
 

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number in the near future here in London—can contribute to ensuring we keep the focus on results on the ground then that is most helpful.

**Q260 Lynne Jones:** Mr Kuyk, you said earlier that the market could take us so far but we needed to operate within a regulatory agenda. I think Ms Leech said that a lot of the legislation was not science-based. Perhaps we can have a little discussion now about your responsibility as food producers in terms of the sustainability agenda. Everybody is agreed that sustainability is essential for food security so we need not go over that. We have had from you details of the work you are doing in terms of sourcing more sustainably, but the real question is the market within a framework because the market has an impact on the framework. Where are we getting it wrong if you are saying that some of the current legislation is not science-based? What would you like to see done to ensure that we have a good framework within which the market can operate for sustainability?

**Ms Leech:** What I meant to say—I apologise if I did not—was that when senior food executives were asked what they saw as risks and weaknesses in the current system one was the perception that regulation was not science-based particularly in relation to some of the health and nutrition issues.

**Q261 Lynne Jones:** If you can send us later some information about where you think the legislation is not science-based that will be useful.

**Ms Leech:** I am very happy to do that. What are we doing? I think Mr Kuyk and I would see our job as to call on government to set the right strategic framework in a way that is evidence and science-based and to be prepared to play a part in helping to contribute to that. That is what we spend our time doing. I do not know whether you want to leap into this area or it is coming later, but you spoke earlier to the witness from Tesco about GM. We have been calling for that debate actively because we think it is one that needs to happen and it must be science-led and science-based. That is one practical example where we are pushing government to have that debate. There are also other areas. We see it as part of our role to ensure that we are on the front foot in terms of highlighting the issues that we think only government can do and lead on and also demonstrate the part that industry can play to add to the debate and knowledge base to take things forward.

**Q262 Lynne Jones:** We will not go over that again, but my point is that the industry has a role to play in making it possible for government to do that, because at the same time as the industry wants to sell its products and not upset its consumers government does not want to upset its electorate. We have to get over this problem. What is needed is some shelter for the market from the politicians and some shelter for the politicians from the market.

**Ms Leech:** We accept that it must be a partnership; everybody must join up. These are big strategic issues and we must find a commonality of purpose,

whether it is industry, government or the NGOs. Within our understandable tensions and different perspectives we must find a commonality of purpose and agenda which means we can harness all our efforts and play to one another's strengths in delivering the changes we need to see.

**Q263 Lynne Jones:** Mr Laan, would you like to comment on the interaction between the market, regulation, government and sustainability? You have produced a nice document about what you are doing.<sup>4</sup> You say that obviously when you produce directly yourself you can impact on that, but obviously you source more widely.

**Mr Laan:** Yes.

**Q264 Lynne Jones:** How do we go beyond the idea of sustainability, animal welfare and things like Hellmann's mayonnaise using free range eggs? To what extent is that just marketing or genuine?

**Mr Laan:** There is interchange with the government on sustainable agriculture here in the UK. We had an exchange of data, material and methods with different public organisations. I have listed a couple of them. We also worked with the agricultural link partnership. For us the material we have here is in the non-competitive area, so what we do is open and we learn from others and we hope that others want to learn from us in this process, including public authorities. We would like to continue our relationship by saying that sustainable agricultural practice is a priority for DEFRA and we work together so that production in the UK can be sold in the market and is being produced in a way that meets sustainability requirements. If that is a pledge for a follow-up commitment, yes, we are interested in a continuation of that relationship. We may want to look at research and development programmes in that area. With single farm payments under the CAP there are conditions attached. Those conditions should also contribute directly to sustainable agricultural practices. There was a recent report by the Court of Auditors on the linkage with these conditions and apparently a number of weaknesses in the system still exist. Those weaknesses must be addressed, so that is also an area of tension.

**Q265 Lynne Jones:** Would you like to identify some of the weaknesses that you think need to be addressed?

**Mr Laan:** Maybe we could do that in a follow-up exchange. We know that there are certain weaknesses in audits and controls done on the spot. I believe that for the system to be sustainable we need to be serious about compliance with the conditions.

**Q266 Lynne Jones:** What about the complexity of it? If you make things so complicated and have so much bureaucracy checking up everywhere, a lot of your time and effort is spent to little effect. How do you deal with the problem of complexity?

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<sup>4</sup> Unilever, *Sustainable Development 2007: An Overview*.

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25 February 2009 Ms Melanie Leech, Mr Andrew Kuyk and Mr Willem-Jan Laan

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**Mr Laan:** Complexity can be an issue. However, if you are serious about the programmes as we are you want to address issues of complexity. If, for example, a water quality directive is in place which is applied adequately you can start from the fact that your water system is accurate. Therefore, you can reduce complexity by having proper implementation of a water quality directive. The same goes for nitrates and the like. Therefore, the best way is to have a common platform from which to start and then you may add additional requirements, of which climate change could be one in future.

**Q267 Lynne Jones:** A lot of the talk about climate change is to do with creating a market and building into the system some pricing mechanism for non-sustainability or environmental damage. Do you have any ideas about how those kinds of mechanisms can be incorporated so it would be, if you like, more self-regulating?

**Ms Leech:** In the food sector we have an existing climate change levy agreement, so to some extent that is already in place. When we launched our five commitments around the environment just over a year ago it gave us an easy way to measure whether or not we were delivering against those targets. As an industry we set ourselves the target of a 20% absolute reduction in CO<sub>2</sub> emissions by 2010 compared with 1990 levels and we aspire to go beyond that to a 30% reduction by 2020. We can measure that without any additional burdens on the businesses through the climate change levy agreement which is already creating a framework within which companies have an incentive to invest to save those kinds of levels of CO<sub>2</sub> and to go further. I think that is quite a good example of a situation where if there is a framework you can use it to monitor and measure. There is no point in making these commitments if you cannot measure whether you are achieving against them, but also the framework itself creates the incentives. It may well be that as these issues become more acute we need to go further than that and create incentives in the system, whether it be through a price for carbon or whatever it might be. That is something government will certainly need to look at to see whether or not that is the way to stimulate the right behaviour or whether the market left to itself will provide.

**Mr Kuyk:** The one resource where the externalities are not properly reflected generally, not specifically in the UK, is water. For energy there are real prizes and incentives for efficient energy use. The same is not yet true of water. That will have to come but very much on a global level because, as Ms Leech said, we have a water target but at the moment that is to do with water used in the manufacturing process in the UK. We really have not started to address the wider issue of embedded water and so on, but that is something that we and industries, not just in the UK but elsewhere, will have to begin to address in years to come. As a footnote, we are talking about food security, but that goes hand in hand with energy and water security. You cannot have the one without the others.

**Q268 Chairman:** Mr Laan, I suppose that for a company like yours, which has important trading links with Africa, sorting out things like HIV AIDS which removes about one quarter of the male productive population can have a devastating effect on sub-Saharan Africa's ability to deliver the kinds of inputs that you need for your food industry?

**Mr Laan:** Yes. We have been deliberately engaged in an active programme on HIV AIDS in Africa for the reasons you mention. For our own employees it is a crucial thing to do but also for their families and communities. If you talk about food security in Africa there are a number of challenges. To work with the local communities to build programmes and use, let us say, support from donor countries like the UK remains a priority in our view. To involve smallholders in Africa with local production is of key importance. If they produce only 20% of the total production then in a situation where food security is tight that production is very relevant indeed in relation to total supply. They have to be engaged. We need to work on programmes and I think more can be done in that area. I should also like to mention our partnership with the World Food Programme. If you talk about the availability of food then the World Food Programme has a role to play especially in emergencies. Those donors of the World Food Programme should reconsider their commitments. The chair of that programme just at the end of last year said that due to high prices the programme could afford only about half of the food aid needed. They had to go round for additional individual pledges in order to fill the basket. There is something to be done there. I hope that the UK contribution to the international agenda will continue to be as active as it was in the past.

**Q269 David Lepper:** Can we look further at consumers and patterns of consumption? Ms Leech and Mr Kuyk, in your submission to us you said that although there was growing public awareness of climate change and its possible consequences there was little evidence to date of it having any material effect on current patterns of consumption. Whose responsibility is it to encourage consumers to think more about sustainability in choosing what to buy especially to eat?

**Ms Leech:** I think it is a shared responsibility across all the sectors about which I talked earlier. It is government's responsibility to be clear about its policy priorities and the things it values within those; it is for the food chain, whether it be producers, processors or retailers, to help consumers interpret information in order to be able to make sense of the choices they are being asked to make consistent with those strategic objectives. It is also incumbent on the NGOs active in a particular field to try to help consumers navigate their way through very complex issues rather than get in the way of them.

**Q270 David Lepper:** That is fine, but as far as I can recall in your submission you did not say anything about food labelling or how that information on the part of the industry should be conveyed to



consumers. Does the Food and Drink Federation have a policy on that? Does it issue guidance to its members?

**Ms Leech:** Labelling specifically on environmental issues?

**Q271 David Lepper:** On any issues related to sustainability.

**Ms Leech:** There is legislation in place that governs labelling and we fully support it. In particular, we fully support the requirements of the labelling directive to ensure that misleading statements about products are not made, whether it be about what is in them or about where they come from. There is a legislative framework in place and people should use it to inform rather than mislead consumers.

**Mr Kuyk:** On the specific issue of carbon or eco-labelling which was touched on in the earlier evidence session, it is not there yet. We come back to the need for an evidence-based approach. The principle that you should label something to indicate how sustainable it is is fine and nobody would seriously dissent from that, but it is a matter of how you do it in an objective way that does not create distortions and consumers can understand it and how you express it on a pack without getting into too much detail. Would you express it as with some nutrition labelling as per 100 grams? Would it be meaningful if you gave a carbon figure per portion serving? A lot more thinking needs to be done on that. We are supportive of the principle but a lot of work is required. This is something that we cannot do at national level; it would have to be done at EU level. Maybe the new commission needs to think about this, but the key is that in a single market it must be done in a non-distorting way and we have to be sure of our ground. If we are being proactive in labelling things in a way to influence consumer choice we must avoid the unintended consequences because we may well find things down the line that with hindsight we might regret. A lot more work needs to be done on it.

**Q272 David Lepper:** I feel rather like Paddy Tipping earlier. We are never going to see it, are we?

**Mr Laan:** On the question of communication with consumers, there are at least two angles. The first is communication on the back of the product. I should like to mention our tea which is certified by the Rainforest Alliance. On Lipton and PG Tips tea consumer information on the pack has an impact. You can have information made available by other means. It may not be on the product itself but is available to the consumer, for example through the Internet and other means of communications. Our involvement in the round table for sustainable palm oil is shared and known not by the information on packs but by the initiative itself and the communication available in the public domain. There are different ways to communicate with consumers. No doubt it is an area where we will talk again with people at European level on how to deal with labelling requirements. That is certainly work in progress.

**Q273 Mr Williams:** One of the issues that has come to the attention of a wide range of people as a result of higher food prices and issues around food security and supply is waste. It is well known that 30% of the food consumers buy is discarded by them and probably half of that is edible. What steps is the industry taking to reduce food waste in the supply chain?

**Ms Leech:** I mentioned a little while ago our five-fold environmental commitment. Two of those are concerned with waste. One is concerned specifically with food and packaging waste in the processing environment. The industry has committed itself to send zero to landfill by 2015. We did a survey last year, which was one year into our commitment, to see how we were doing. Last year our members prevented over half a million tonnes of food waste from being created and they recycled or recovered 82% of the packaging waste created in factories. This has been a real focus for us in the past year and it will continue. To get to zero waste going to landfill by 2015 depends on external factors such as the infrastructure being there to divert the waste that cannot be recycled or recovered to other things, for example potentially anaerobic digestion. But that is our very clear, simple commitment and we have already made a huge amount of progress towards that.

**Q274 Mr Williams:** Is it in your interests to reduce food waste? If you are selling it to the consumer you are making money on it.

**Mr Kuyk:** There are different ways to look at it, but as a manufacturer if you are wasting something that is a cost to you.

**Q275 Mr Williams:** But you are not wasting it; it is the consumer who wastes it.

**Mr Kuyk:** That is a different question.

**Ms Leech:** If you look at food waste in the home, your figure is the right one. The significant majority of the food that is wasted in homes is avoidable. There are a number of things that can be done about that, whether it be by government helping by promoting products like dried, frozen, tinned fruit and vegetables under the five-a-day scheme as an alternative to fresh produce—because a lot of what is wasted is fresh food and vegetables—whether it is the Food Standards Agency and the confusion that some consumers have about best before dates, use by dates and all of that, obviously without compromising food safety, or whether it is more research on improved packaging so we can extend shelf life safely. All of those things government can do. There is also a lot industry can do to help consumers understand how to avoid waste and provide the right product so that waste does not happen. There is a lot that we can do, and we are certainly committed to trying to do it. We are working with WRAP<sup>5</sup> which is another of our commitments to try to reduce the amount of waste in the home and help consumers avoid that.

<sup>5</sup> Waste and Resources Action Programme.

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25 February 2009 Ms Melanie Leech, Mr Andrew Kuyk and Mr Willem-Jan Laan

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**Q276 Mr Williams:** It is still not necessarily in your interests?

**Mr Laan:** It could well be in our interests as well to use left-overs and provide portion packs. If you take, for example, the Knorr Vie products representing 50% of your required food and vegetables daily intake that is certainly something where you do not see a lot of waste at the consumer end, so it is for the industry to make sure that the products can be used efficiently. At the consumer end there is lot to be saved.

**Q277 Mr Williams:** So, you sell a little bit less to the consumer but charge the same amount of money?

**Mr Laan:** We try to adapt it to their actual needs, yes.

**Q278 Mr Williams:** Is there anything else that DEFRA can do? Does it have a role in reducing food waste both in processing but also at the consumer's house?

**Ms Leech:** I have mentioned the infrastructure. Clearly, there needs to be a certain amount of planning to make sure the infrastructure is there to deal with unavoidable waste. There is a key role around consumer information. I think there was a debate within government as part of the action plan flowing from the report *Food Matters* about who was the right person to talk to consumers. I have some sympathy with the idea that there should be a one-stop shop to deal with all of these issues, but there is clearly a role in raising awareness and helping to continue to educate consumers.

**Chairman:** Thank you very much for your evidence, information and your offer of further written submissions to the Committee. I am grateful particularly to Unilever for two publications it has kindly given to us; they certainly make interesting reading. Thank you for coming to give evidence and also for the earlier written evidence that you supplied.

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### Supplementary memorandum submitted by the Food and Drink Federation (SFS 29a)

#### INTRODUCTION

This supplementary note is provided by the Food and Drink Federation in response to issues raised at its oral evidence to the Committee on 25 February 2009. It covers three areas:

1. regulatory burdens and the quality of and basis for policy-making;
2. the importance of science and research and development; and
3. consumer information.

#### REGULATORY BURDENS AND GOVERNMENT POLICY-MAKING

Food and drink is the largest manufacturing sector in the UK—with around 7,000 enterprises generating total turnover of £72.6 billion and employing around 440,000 people. FDF members feel strongly that the Government should do more to recognise the importance of a thriving food and drink manufacturing sector to the success of the UK economy.

This was a key theme to emerge from a survey of senior representatives of FDF members carried out by Professor Bruce Traill of the University of Reading in 2007. The survey found that industry leaders felt they receive limited support from Government. Worse, they fear that our sector is all too often made a scapegoat by policy makers who fail to appreciate the positive role it plays in the overall economy. This tendency is felt to be much more pronounced than in other countries, notably the US, where our members believe industry and Government work more closely as a partnership.

A Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis of the industry based on Professor Traill's survey of FDF members identifies regulatory issues as the biggest perceived threat to the future competitiveness of the sector. Companies cite key areas of concern as being: over-regulation and inconsistency across government; premature legislation; legislation that is not science-based and a perception (rightly or wrongly) that EU legislation is over-enforced in the UK compared with other Member States.

The regulatory climate is of particular concern to smaller and medium sized food and drink producers, which make up the bulk of manufacturers in the UK by number. A separate survey carried out on our behalf by ADAS confirmed how worried SMEs were about both the cost of staying on top of ever-changing legislation and ensuring they remained fully compliant with the myriad of rules and regulations affecting our sector.

In particular, the smaller companies in our membership feel strongly that the plethora of UK-specific employment and social policies introduced in recent years have impacted on our competitive position. In a food market that is increasingly operating on an EU basis, this puts UK producers at a competitive disadvantage to their European counterparts.

Legislative burdens, non-evidence-based interventions and regulatory creep impact every aspect of our members' businesses, and ultimately can undermine the UK's attractiveness as a place in which to invest in manufacturing capacity.

The following examples highlight some of our concerns:

- *Food and drink colourings*: Late last year, the UK Government and the Food Standards Agency ordered a “voluntary” ban on the use of certain artificial food and drink colourings. Their decision was based on the findings of a single UK study that has been widely criticised and, indeed, the findings of which have been rejected by the European competent authorities. UK producers must now comply with this “voluntary” ban—which is at odds with the prevailing EU regulations and which does not apply to food, drink or alcoholic beverages imported from Europe (where these colours continue to be legally approved). On a related point, there is genuine disquiet among food and drink producers that no Government Department or agency has been prepared to defend the positive role that food additives and ingredients play in the development of products that respond to consumer and/or societal concerns. For example, sweeteners provide one solution to a key public health concern (obesity). These ingredients undergo stringent testing to ensure their safety and, yet, are routinely attacked—without negative statements ever being countered by clear advice for consumers from “official” UK bodies.
- *Nutrient profiling*: The UK's current restrictions on TV advertising are underpinned by the use of a nutrient profiling model developed by the FSA that has now been widely criticised for being based on bad science. The model was even described by the then Public Health Minister Caroline Flint as being the “best we could get”. We don't think that is a good enough basis for restricting companies' legitimate freedom to operate. In addition, despite assurances to the contrary, we have always feared the model would be extended to areas outside broadcasting as a simplistic way of identifying “good” and “bad” foods. These fears proved well-founded last year when the Welsh Assembly Government—against the advice of the FSA—announced new guidelines for healthy vending in Welsh hospitals—based, in part, on the nutrient profiling model. Thanks to these guidelines, a wide range of products including sugar-free drinks, cereal bars and even cheese and tomato sandwiches are all deemed “unhealthy” and banned from vending machines.
- *Trans-fats*: In October 2007 the Health Secretary called for a ban on trans-fats and asked the FSA to undertake a review in light of action in Denmark and New York City to impose mandatory restrictions on these types of fats. The clear implication was that he felt similar action was necessary in the UK causing immediate reputational damage to the industry. In the event following its review of the evidence, the FSA's Board recommended to UK health ministers in December 2007 that mandatory restrictions were not necessary since voluntary measures by the industry had “reduced artificial trans fat levels in food and UK average dietary intakes dramatically” which is “lower than the most restrictive controls introduced by Denmark”.
- *“Voluntary” Agreements*: our sector is subject to a myriad of ‘voluntary’ agreements, targets and best practice guidance. For instance: we understand that the Food Standards Agency is planning shortly to introduce sector-specific “voluntary” targets for saturated fat and sugar reductions in food and drinks—that will set unrealistic deadlines (in some cases as early as 2010), appear to be based on limited or no evidence, or scientific rationale, and take no account of the commercial pressures facing producers in the current economic downturn.

### *The EU regulatory process*

The *Food Matters* report identified the growing influence of the EU on the regulatory landscape. In our experience, the EU regulatory process is subject to lengthy political negotiation that does not always result in legislation that is easy to use. This means it is vital that the UK Government engages in Europe in a way that helps shape sensible policies and that it works with industry from the earliest possible stage of the process to agree priorities and identify potential risks to UK industry's competitiveness. The recent example of legislation banning a wide range of crop protection products and pesticides is a timely reminder of what can happen if effective engagement does not happen early enough.

## 2. INNOVATION, RESEARCH AND DEVELOPMENT

Adding value through R&D, technology and sophisticated marketing are current strengths of our sector:

- food and drink manufacturers invest around £300 million a year on R&D;
- in a typical year, 8,000 new products will be launched in the UK—making us one of the most innovative markets in the world; and
- top-performing food companies can expect around 15% of growth to come from innovation.

Maintaining our competitive position relies on ensuring that global companies continue to invest in the UK—given that the top 5% of companies account for 75% of our sector's GVA. Just as important is their ability to offer the best people a challenging and rewarding career path. However, in recent years, student

interest in food-related science based subjects has dropped significantly (illustrated by a marked drop in applications to relevant courses). The provision of relevant courses in the right location is vital, but we see both the supply of relevant courses and marketing of these courses in decline.

There is a significant risk that there will be insufficient food scientists and food technologists to promote the future growth of the food and drink manufacturing sector. Research carried out last year by Improve, our sector skills council, suggests that up to 25% of food science/food technology posts were vacant; this equates to 2,360 positions being unfilled at any time. So DBERR initiatives such as Manufacturing Insight and Manufacturing Futures are critical to the future health of the food chain and ultimately to our food security.

We are working in partnership with Improve to follow through on a number of solutions identified to address the issues faced in the sector for food science and technology. Workshops to facilitate action, including identification in provision gaps, careers advice enhancement and marketing of the sector are being developed.

Our industry has a good track record of investing in its people—recognising the importance of investing in this valuable resource to remain competitive and effective. We estimate that our 20 biggest members are now providing around three million training hours each year at a cost of around £8 million, for instance.

### 3. CONSUMER INFORMATION

There is understandable interest in discussing how companies should present information that highlights the “sustainable performance” of their products.

Our members have a good track record of providing relevant information for consumers in an easy-to-digest format, usually in the form of an accreditation mark on packs. The increasing popularity of products carrying the Fairtrade or Rainforest Alliance brands are good examples of how our industry has embraced important aspects of the sustainable sourcing debate and taken them into the mainstream. Similarly the success of the LEAF Marque, Red Tractor logo and the Freedom Foods scheme are further signs of how consumers are able to identify products that address specific concerns about particular aspects of the food production system.

The growth in the organic food market is, of course, addressing another important consumer need—although, in this case, the simple use of organic branding on packs (backed up by an appropriate accreditation mark) is conveying some complex lifestyle choices.

More recently, the spotlight has turned onto carbon measurement and labelling. FDF has been at the heart of work led by the British Standards Institute, Defra and Carbon Trust to develop a single UK methodology for measuring carbon footprints across whole supply chains. The BSI’s Publicly Available Standard (PAS 2050) was published in October 2008 and we support its development as an important tool for driving CO<sub>2</sub> hotspots out of the food chain.

PAS 2050 may also provide the sort of standardised data that will be necessary if we are to communicate effectively with consumers on the issue of carbon reduction. Work is now underway to evaluate how best to provide such complex information (particularly to help people make comparisons between different products)—and whether that should be done online, at the point of purchase or on pack.

As other sustainability issues come to the fore—such as the provenance of ingredients or the use of air transportation—there is always a danger that packs will become overloaded with information and cluttered with logos. Given the complexities of all the economic, environmental and social issues that underpin our current understanding of sustainability, it is debatable whether it will be possible to develop a single labelling system that is able to capture the nuances of all these issues simultaneously and present that in a meaningful way (and it is worth remembering that there are other pressures on food businesses to provide information on-pack e.g. related to health issues).

The types of schemes outlined above are all currently provided on a voluntary basis. Producers listen to their consumers in deciding what is required and how that information should be presented. Today, we tend to see logos on packs; in future, we are likely to see more in-depth information appearing online as the debates and the issues that interest consumers become equally more detailed and complex.

We also suspect that efforts to create regulatory responses to this debate are fraught with danger—not least because such solutions would need to be negotiated at an EU level, which does not always result in the best regulation. For instance, we remain concerned at efforts to extend the EU Eco-label scheme to cover food and drink products, which would introduce the concept of a simplistic pass/fail approach that is not suited to our sector.

*March 2009*

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## Wednesday 4 March 2009

Members present

Mr Michael Jack, in the Chair

Mr James Gray  
Lynne Jones  
David Lepper

Dr Gavin Strang  
Paddy Tipping  
Mr Roger Williams

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### Memorandum submitted by the National Federation of Fishermen's Organisations (SFS 48)

#### INTRODUCTION

The NFFO is the representative body for fishermen in England, Wales and Northern Ireland. Our member vessels range from 40 metre stern trawlers operating at North Norway and Greenland to small, under 10 metre vessels, beach launched and with limited range. The Federation holds seats on the EC Advisory Committee for Fisheries and Aquaculture, and the North Sea, North West Waters, Pelagic and Long Distance regional advisory councils. The NFFO is also a member of Europeche, the European trade federation for the fishing industry.

#### CONTEXT

The NFFO is concerned with the capture of wild fish and shellfish, and its responses reflect this fact and do not comment on matters that affect other areas of the food system.

#### *How robust is the current UK food system*

Robust is taken to mean the ability to respond and adapt to changing circumstances. The commercial fishing industry exhibits many indications of strength, but there are areas of weakness.

It must be remembered that the UK fishing industry is governed by the Common Fisheries Policy, CFP which has the achievement of Maximum Sustainable Yield, MSY, as a key objective. The CFP applies in UK waters not only to UK vessels but also to other European fleets. For key species, the CFP currently sets how much may be caught, how many days may be spent at sea, what gear may be used, and how the catch may be marketed. Although there is currently a move towards Long Term Management Plans for these species (which are aimed at increasing stocks), and progress has been made, a degree of inflexibility remains. The institutional process means that responses are slow and, currently, bureaucratic.

Nonetheless, it must also be understood that the fishing industry is in a permanent state of change. Fish have never stayed in the same place waiting to be caught and as a result the industry has always had to adapt. It adapts temporarily through changing the time when species are targeted: it adapts spatially by changing the area that is fished; and it adapts by changing the species that is targeted.

Furthermore, the marine environment is not static but constantly changing. The hydrological patterns change and there are Cycladic shifts in currents. Temperatures constantly vary over the year and among years. Salinity alters. The fishing industry is inevitably forced to respond and adapt.

Whilst individual vessels may be flexible in their responses, the industry as a whole is capital intensive and therefore not very flexible. Large amounts of capital are tied up in vessels which inhibit exit from and entry into the industry. In addition, if there is no excess capacity it will take time for the industry to respond to an increase in demand with a new vessel taking well over a year to commission and more likely two.

For these reasons, the fishing industry exhibits both strengths and weaknesses. The weaknesses are institutional and structural. The strengths are in the adaptive ability of those who work in the industry.

#### *Ability to cope with predicted increase in demand*

The UK runs a deficit on trade in fish products. Currently c.60% of global fish production is traded. In 2007 the UK imported 782,000 tonnes (£1,847 million) and exported 438,000 tonnes (£923 million). It should be noted that the value will alter substantially according to the strength or weakness of sterling. Cod, haddock, tuna and shrimp and prawns are the chief imports, whilst herring, mackerel and shellfish are the main exports. In general terms, exports cannot be substituted for imports, and vice versa.

In addition, it should be stressed that the supply of fresh fish (as opposed to frozen) is always subject to seasonality and fluctuations in market supply. This characteristic acts as a negative attribute in a world where consumers (and by extension processors) expect a constant supply of fish species throughout the year.

Estimates of consumption vary, with the FAO estimating over 1 million tonnes a year, whilst UK statistics imply 666,000 tonnes in 2006. On the basis of the UK statistics, the population eats roughly one portion of fish a week, which means that in order to reach the suggested two portions of fish would require a doubling of supply. This effectively means that there needs to be a major increase in the availability of white fish either from imports or increased domestic supply. If this proves difficult to attain then eating habits will have to be changed and demand re-orientated to other species and shellfish.

The ability of the global market to respond to these challenges is by no means guaranteed. The Pacific, which provided much of the increased catch in the past, is starting to be over-exploited and aquaculture is unlikely to be able to continue the rapid expansion of past years. In addition, domestic requirements in emerging economies are likely to reduce the type, and amount, of fish reaching the international market.

Concerns about sustainability and the drive towards stock recovery in the seas around the UK have meant restrictions on catching within the EU' Common Fisheries Policy, CFP. Although, in the longer term it is expected that fish stocks will recover there is no certainty that they will reach previous levels due to changes in the marine environment and climate change. Furthermore, the reduction in capacity after de-commissioning schemes means that there exists the possibility of a lack of skilled, trained, personnel.

As a result, the UK industry is not presently in a strong position to immediately increase landings to meet projected increased demand or to make good shortfalls in international availability. Looking towards the future, however, the increased prevalence of Long Term Management Plans should lead to sustainable, higher, stock levels permitting the industry to respond more rapidly to increases in demand.

#### *Impact of changes in the marine environment*

Whilst it is in the interests of all to pursue the goal of sustainability of fish resources, it should be borne in mind that the blanket closure of large areas of our seas to create Marine Protected Areas, MPAs, has the potential to further reduce the responsiveness of the UK fishing fleet if these areas become No Take Zones, NTZs, by excluding all fishing activities from some of the most productive sea areas.

Otherwise, because the impact of climate change is relatively gradual, the fishing industry is already responding and adapting to different conditions. Fishing is constantly changing its fishing patterns and diversifying into other species. The need is to encourage the consumption of fish and shellfish which, at the present time, consumers are unwilling to try.

#### *DEFRA's role*

A key role for DEFRA lies in ensuring that the CFP functions more effectively than it has done in the past. Reducing the level of micro-management by the Commission and increasing support for the regional approach evidenced by the Regional Advisory Councils, RACs, is highly desirable. Improving the transparency (and legitimacy) of the CFP is important for achieving the goals of sustainable, economically viable fisheries for the food supply system.

At another level, it is not helpful to have various Government Departments and NGPDs seeking to expand their remit from consumption into the production side of the food supply chain. Although attention has recently been given to the question of food there is at the present time no national food strategy. Clear lines of responsibility for food supply should lead back to DEFRA.

#### *Monitoring criteria*

Extensive monitoring already exists for the catching fisheries through MFA in order to meet CFP requirements on landings, capacity and profitability.

In addition, details as to the per capita consumption in the UK of fisheries' products and the rate at which it is increasing, or decreasing, should be improved.

Perhaps additional attention should be given to establishing by species an index of the desired percentage to come from imports and observing its progression.

Whilst sustainability is an important objective, care should be taken to ensure that the definition is clearly defined and understood. In a mixed fishery such as the North Sea, for example, MSY is a desirable objective, but it should be borne in mind that it is impossible for all species to be at MSY levels at the same time given the inter-relationships and the predator/prey factors involved.

#### CONCLUSION

The contribution of fish to the security of food supplies depends upon the ability of the domestic industry to provide a substantial portion of the products consumed. At the present time the industry does not produce sufficient products that the consumers want and the shortfall is made good from imports. Since the UK exports certain species of fish and shellfish, the gap could be reduced if consumers' tastes altered.

The current state of key stocks, and the CFP, means that, although the fishing industry has the potential to do so, it is not in a position to respond quickly to increases in demand. Although the signs are that stocks are recovering, the institutional rigidities engendered by the CFP mean that response time is slow.

Thus, fisheries will make a contribution to meeting the increase in demand forecast for 2030, but it is unlikely to be on the same scale as the projected increase.

*National Federation of Fishermen's Organisations*

*January 2009*

*Witness: Mr Barrie Deas*, Chief Executive, National Federation of Fishermen's Organisations, gave evidence.

**Q279 Chairman:** We are going to start a little bit early because we want to go on, so that is why, Barrie, you are here without yet the members of the public and the vast army of supporters you normally bring with you. Can I welcome officially the Chief Executive of the National Federation of Fishermen's Organisations, Barrie Deas. Barrie and I go back a long way to those dim and distant times when, as a former Fisheries Minister, I remember spending my Saturdays in the delights of Derby and the Midland Hotel when I had to make the best of explaining the then Government's policies on fisheries to your members. That is a dim memory, but nonetheless I am grateful to you for coming before us today and for also your written evidence. I think the overall impression I got, in spite of the efforts which are being made and which indeed your organisation is playing a leading part in, was that you rather felt that in terms of the fishing industry from a UK standpoint—and I appreciate that there is, if you like, a parallel organisation in Scotland, but you do have a lot of knowledge of the UK situations—the industry would struggle to make a contribution to meeting the targets which the FAO put forward in Rome last year in June. Would that be a fair assessment? It was almost a bit of a counsel of despair, I felt.

**Mr David:** First of all, thank you for the welcome. I do not think it is true that we counsel despair in this regard. I think we are realistic about the constraints we operate under and that in meeting the objectives to increase the yield of fisheries we face a whole array of problems, largely I have to say because we operate within the constraints of the Common Fisheries Policy. That is not an argument for doing nothing, it is just being realistic that we have to find our way through, with our partners in the EU, against the background of a system which has been less than successful in delivering sustainable fisheries in the recent past. Actually, I am quite optimistic about the future of fisheries if we can make progress on that front. I think there is a will in the industry to move forward out of the problems we have faced in the past and I think there are the means to do it, so actually I am a bit of an optimist.

**Q280 Chairman:** I am pleased to hear you say that. If one takes a global perspective, from the evidence we got from the Marine Conservation Society they pointed out that over 2.6 billion people are supplied with 20% of their average protein intake by fisheries and I think that leads one to the global challenge of

balance between fishing activity and effort and the kind of stock conservation which you alluded to in your remarks. If one takes the fact that there continues to be a global increase in demand for marine products, do you think it is going to be possible for fishing communities on a global basis to try and instil amongst themselves the disciplines that are necessary to enable sustainable fisheries to cope with the kind of extra demand which is inevitably going to occur, if for no other reason, with a rising population?

**Mr Deas:** That demand is certainly there, as you say, because of a rising population but also consumers' tastes. For the last ten years or so demand has increased. I think the answer lies with the management system. I think what we have struggled under with the Common Fisheries Policy is a highly top-down prescriptive approach, trying to manage a whole array of quite complex fisheries across 40 degrees of latitude. Somebody else said that that is an ambition worthy of Napoleon, especially when you think the attempt is by a relatively small bureaucracy in Brussels to effect this style of management. It really is quite reminiscent of East European regimes in the past. I think there is a recognition that we need to move to a more participatory approach, a more differentiated approach to fisheries focused on stocks, where they are, and when you quote global figures to me they mean nothing. I just cannot relate to them at any sort of level. We are quite frequently confronted with statistics which demonstrate that 85% of stocks are crashing around our ears and that just does not relate to my experience whatsoever. I think it is a very differentiated picture. There are stocks which are actually quite robust and the trends are increasing. With North Sea cod, which I think was taken as a really iconic stock, a litmus test for the Common Fisheries Policy, the stocks are recovering quite quickly at the moment. With other cod stocks, for example the west of Scotland, it is not such a happy picture, yet other stocks are kind of in the middle, they are stable, but if we did some other things that we are doing now the yield could be increased. I think it has to be remembered that despite the Johannesburg Summit's conclusions and commitments, it is not actually possible to have all stocks at maximum sustainable yield all at the same time because they tend to eat each other. The predation effect is there and has to be taken account of. Nevertheless, I think some kind of proxy for a maximum sustainable yield is an admirable

4 March 2009 Mr Barrie Deas

ambition and one we should strive towards. As for the commitment within fishing communities towards conservation, I think it entirely depends on whether the regime allows them to participate and contribute, and the recent past has demonstrated that there is that will there if the needs can be found to harness it.

**Q281 Chairman:** The reason I mentioned the global position is that obviously the United Kingdom imports a very considerable amount of the fish it eats and whilst I understand very much the basis of your critique of the Common Fisheries Policy, when one looks at other parts of the Globe—and I appreciate that your focus is on the waters around the United Kingdom—I would judge that it becomes more difficult the further you move away from the more sophisticated political regimes to have the kind of agreements which will help to keep a proper balance between fishing efforts and the stocks that are available. On the other hand, from the point of view of the United Kingdom's consumption of fish, those disciplines are actually important if in the long term we are going to have security of supply in our diet of appropriate fish products.

**Mr Deas:** I think it is true to say that the consumption of some of the exotic species has increased in recent years, but I think most of the imports of the stocks consumed in this country are from the Northern Hemisphere, Iceland, north Norway, in the north east Arctic cod, the Faroes, Russia, these are the cod stocks which have traditionally supplied the British market. Iceland certainly could not be categorised as having an unsophisticated political regime and Norway has a fisheries regime which in many respects is a model, without going overboard –

**Q282 Chairman:** I was thinking of further away than the immediate Scandinavia. I entirely accept the point you make because they are very sophisticated and very successful regimes, extremely well-disciplined, well-managed and well-run in every respect, but let me just move on. You mentioned sustainability. Do you have anything to give as a guidance from your point of view about how you would define a sustainable fish stock, because you were in a way critical of some of the scientific appraisals or techniques which have been used within our European waters to define that? What is the organisation's view about a definition of "sustainability"?

**Mr Deas:** I have not devoted a lot of thought to definitions. I think we can do an awful lot better than we do now and I think moving in the right direction is more important than some abstract arcane discussion about targets and objectives. We have had this with North Sea cod and you can pick a particular fishing mortality rate or biomass target, but whether that is going to be appropriate in five, ten, or 15 years' time, who knows, because we are in a situation where the only constant is change, partly because of climate change. I think we have to find ways of dealing with uncertainty and the way to do that is to have institutional frameworks where we

can sit down with the scientists and decide for a particular stock what is appropriate, but I think it is more important to be moving in the right direction than to spend an awful lot of time defining ultimate targets.

**Q283 Chairman:** It is all right to say "moving in the right direction" but you are going to have to have some way of defining what that direction is and some way of knowing whether it is right. I appreciate there may be a healthy debate on those parameters, but you have got to have some degree of objectivity otherwise you will never know whether you are travelling in the right direction.

**Mr Deas:** That is true, and I think we have the tools. The fishing mortality—that is the proportion of the fish that is taken out of the stock each year—and biomass targets both have problems associated with their definitions, but I think they are strong enough definitions (as long as the data is going in) to use to tell us whether we are moving in the right direction. There have been problems with the science. I think that for around 60% of the stocks surveyed by ICES—the International Council for the Exploration of the Sea, which is the international body which provides the Commission with scientific advice on fish stocks—ICES tells us that they cannot provide analytical assessments. They can provide a kind of best guess but not an analytical assessment, largely because of uncertainties in the data, and I think that must be a priority, to plug that gap. I think there are strong signs that ICES are reforming their internal way of working to take account of other forms of knowledge which, for example, the fishing industry can provide to strengthen and supplement their assessments. So I think there is movement in the right direction within the science. I think it is important that we keep that momentum going. So the criteria of whether we are moving in the right direction ought to be there, particularly for the main stocks anyway. In the United Kingdom, I do not know if we are unique but we are certainly frontrunners in terms of the number of stocks which our fleets target and therefore which our authorities are responsible for, and you, as a former Fisheries Minister, will be very aware of the limited political capital you have to spend at the Council and the whole array of demands for that political capital. It is one of the disadvantages of our geography, I suppose.

**Q284 Chairman:** What is your assessment of UK fish science? Have we got the resource? Are we up to doing the work in contributing at both a national, European and international level? What is your assessment?

**Mr Deas:** I think our experience of CEFAS (the English scientific body which provides the Government with scientific advice), the quality of the scientists, is that they are very good and we are working collaboratively with them through something called the Fisheries Science Partnership, which Defra funds. I think funding is a problem always, but I think the quality of the work that is done is very high and seems to be highly regarded by



4 March 2009 Mr Barrie Deas

fisheries scientists from other parts of the community. But there is always a problem of resource and therefore I think the scientists are thinly spread. There are particular areas where we would want to see more work done. Just a few examples are North Sea whiting, where there is a particular problem. There is something going on with that stock. There is an abundance on the east coast but there seems to be a dearth elsewhere and nobody can really tell us why. Skates and rays in area 7, the Bristol Channel and generally in area 7, there is a need for work there. So I think the quality of the work is good, but the resources are a problem.

**Q285 Chairman:** One of the things I struggled to find in your evidence was any mention of aquaculture and work has been going on for a long time as to whether in fact you could effectively, from a UK standpoint, fish farm some of the species which are under threat. Where does the organisation stand on substituting fresh catch and what do you think is the potential around our shores?

**Mr Deas:** I think the issue is around our shores. Aquaculture certainly has a role, and a significant role, to play and I think there is a lot that can be done on land sites to expand production and there is no real problem there. I think there is a whole range of problems when you come to aquaculture at sea. The sites, for a start. There can be problems of conflict with inshore fisheries. There are problems of escapees tainting the natural stocks and with pollution around the cages. I think one of the most problematic aspects for these stocks is that on the conventional figures it takes about four kilos of wild fish to grow one kilo of farmed fish and that potentially is a problem of some magnitude threatening the eco system if you take out the feed species, such as sand eel and pout, that a lot of the human consumption species depend on. So I think there are constraints, shall we say, or obstacles to the development of aquaculture at sea, but I do not think we have got anywhere as far as we should do on aquaculture on land sites. I think that is an entirely different question.

**Q286 Dr Strang:** To what extent are you satisfied that the reform of the Common Fisheries Policy is going in the right direction? From the point of view of this inquiry the right direction for us would be one which enabled the industry to play its part in ensuring that the UK had a stable and sustainable supply of food in 2050.

**Mr Deas:** That is actually quite a difficult but very interesting question because there are different signals coming out of Brussels at the moment. This is against the background of a very critical report by the European Court of Auditors on the Common Fisheries Policy. One strand suggests that the solution is much tighter enforcement supplemented by modern technology based on satellite monitoring of vessels' locations, electronic log books and the like. I think that is going down a blind alley. That is not to say that we cannot use modern technologies, but I think it is a big mistake to suggest that a souped-up version of what we have now will deliver

sustainable fish stocks. The alternative version also being talked about within Brussels is to move away from the prescriptive top-down approach I mentioned earlier to something in which there is a great deal more self-regulation but within a framework of standards and principles which are laid down by the Council of Ministers and the Commission, and presumably the European Parliament in due course. I think that is a very interesting route to explore because I think it would transfer responsibility onto the industry to develop its own sustainability plans for groups of vessel operators. We could discuss what the appropriate group would be, but the groups would write their own plans in conjunction and collaboration with scientists over how they would operate sustainably for the next five or eight years or so. Those plans would be audited periodically. But if you do that, you can scrap great chunks of the technical detail which is now written in the Common Fisheries Policy, the technical conservation rules, some of the control rules, because each individual plan would specify how the vessel is going to operate, for a start how many vessels the capacity of the fleet would be, what gear the vessels would be using. So I think there is a great deal of merit in that approach. There are practicality issues which need to be addressed, certainly—how would the monitoring take place, how would the auditing take place—but the way I would see it is that the responsibility would be on the industry to demonstrate that they are operating sustainably in accordance with the plans they themselves have written, and I think that is a huge cultural shift. I think it is a move away from a paternalist system to one in which there is a certain level of maturity within the industry to take care of the stocks their future depends on. I fully accept there is a range of issues which need to be addressed, but this is thinking that is going on currently within the Commission so I think that the forthcoming 2012 review of the Common Fisheries Policy offers a very interesting opportunity and a choice. Which way are we going to go? Are we going to go for a more top-down Eastern European approach, which has not worked in the past, or are we going to do something new and work on how we would develop this new system?

**Q287 Dr Strang:** These local areas would be well below the level of the nation's fleet?

**Mr Deas:** Yes. I see them in terms of groups of vessels and it might be a producer organisation, it might be on an international level, it might be the Regional Advisory Councils. I do not see those as being the group because there is too wide a range of stakeholders there. It would have to be people who have a stake in the industry and who have something to lose if things go wrong, but I do think there is a template there which offers a route out of this kind of paternalist approach which really has failed us in the recent past. I have some sympathy with the difficulties and challenges of writing legislation, highly technical legislation which applies to multi-species, multi-gear, multi-jurisdiction vessels of various sizes. You are writing rules for a 30 metre

4 March 2009 Mr Barrie Deas

trawler and an under ten metre trawler or vessel. That is a very difficult task and I think we have to just move away from that model in which somebody in Brussels tries to anticipate every eventuality and write it into the regulation because it inevitably generates a request for derogations which undermine the force of the legislation and I think it is one of the major reasons why we do not have a management regime that delivers at present.

**Q288 Dr Strang:** Just finally on this question again of achieving a secure food supply for the UK, to what extent do you think that objective should feature in the British Government's approach to CFP and farming?

**Mr Deas:** I think it should be up there at the top. It is fundamental. In a way I suppose it is coming back to basics because after the Second World War I think food security was something very much at the forefront of political thinking and was the reason why the fishing industry had a great deal of political clout at that time. I think things have moved on and there have been concerns about food safety, not particularly in relation to fish so much, although some species, I suppose, shellfish, but food safety has been an issue and the environmental impact of fishing has come to the forefront. All of these, I think, are elements which need to be borne in mind. I think the food security issue has come back to the forefront of political thinking from that period just after the Second World War.

**Q289 Chairman:** I suppose it is like everything else, if you had a much better situation of overall stocks you would need less regulation, because it has always struck me that regulation is trying to bear down on the fundamental problem of dividing out a diminishing asset? If it was the reverse, by definition you would not need to regulate so much, so there is, I suppose, an incentive to move to a more conservation-minded regime, to trade off a light touch in terms of the regulatory requirements?

**Mr Deas:** Yes, I think there is a prize there because there is no stability in the regulatory regime. Every year there are major changes to the rules which I think are very depressing from a vessel operator's point of view, simply trying to operate sustainably and legitimately within a highly complex set of rules which are constantly changing, so some stability in the regulatory framework I think would be very welcome. I think to a considerable extent you are right that there have been crises, particularly with North Sea cod, which have driven the regime and driven the rules. On the other hand, the whole range of stocks I mentioned previously makes one slightly concerned that there is always going to be something there is going to be a problem with. At the moment shellfish stocks are very strong and that may be because demersal fish stocks that predate on shellfish at certain stages in their lifecycles have been low and if there is a recovery in the demersal stocks what does that mean for all the other stocks? So there is a slight anxiety that we are into a never-ending cycle, that

there is always going to be a problem with some stock or other, but in general terms I agree. I think the experience of Canada, where a major cod stock collapsed on the east coast, sent a signal that we cannot just assume that a fish stock will take everything that we can throw at it, but I think we have moved a long, long way from there and I do think the time is now to look at something which is tailored to specific fisheries, tailored to particular vessels, tailored to particular regions, and that sits very uncomfortably with a kind of monolithic Common Fisheries Policy. But I think there is a recognition that that is the direction in which we have to go and indeed we have already set off in that direction with the establishment of the Regional Advisory Councils. That is, I think, a step in that direction.

**Q290 Paddy Tipping:** Do you think Defra gives the marine environment sufficient priority in its work?

**Mr Deas:** Well, there is the Marine Bill, which would suggest a fairly substantial commitment to the marine environment, so I think the broad answer has to be yes. I worry that the fisheries bit of Defra does not have enough people. It seems to me that there is a tremendous burden on officials and not enough staff to do the work, particularly given that Defra has to develop the UK position as well as looking after its more local English, if you like, responsibilities. From what I observe, I think there are good quality people there, but I think there is a tremendous burden placed on a very few people. So I would say in general terms, yes, I think the marine environment and the Marine Bill would suggest that it is something which is now taking a high priority, but I do worry about the fisheries part of it.

**Q291 Paddy Tipping:** If there were extra resources in the fisheries section of Defra, what extra work would they do or would it just be higher quality work?

**Mr Deas:** I think it is higher quality. It is the work, the preparation, if you like. If you are going to be influential in Europe, like everywhere, you need to put forward coherent, well-argued, evidence-based argument and that is not something which can be done easily or quickly, and that takes people. I do not think it is a problem with quality, I think it is a problem of numbers and the back-up and support.

**Q292 Paddy Tipping:** Mooted in with that, does Defra monitor more fish stocks or do they only monitor some fish stocks?

**Mr Deas:** Again, CEFAS is the body which is given responsibility by Defra for monitoring fish stocks and that is done for the white fish stocks because those stocks are mainly shared stocks with other countries, through ICES, the international council. I think shellfish stocks are something different, they are more local. My impression is, yes, that Defra plays its role but it has to be done on this international front and there I think the scientists themselves would acknowledge that there is a whole

4 March 2009 Mr Barrie Deas

range of reasons why, for a number of stocks, 60% of the stocks, there are data deficiencies or uncertainties in the data which make the assessments questionable. I think that is problematical, but that is not something that can be done simply by allocating a bit of the Defra budget towards it. It is a more endemic problem than that.

**Q293 Paddy Tipping:** I just wonder if I could read you a comment you made recently and maybe you could expand it a bit because I am not entirely sure what you meant by it when you said, "It is not helpful to have various government departments seeking to expand their remit from consumption into the production side of the food supply chain." Were you talking about the Department of Health there?

**Mr Deas:** Yes, possibly. I think this was advice, or there was a debate about whether the Foods Standards Agency should provide advice on the sustainability of fish stocks and I felt that was territory they were straying into without the expertise to ensure that the advice they were giving was soundly based. I think that is the origin of that remark.

**Q294 Paddy Tipping:** But this is way outside the FSA's territory, is it not?

**Mr Deas:** Yes, that would be my view and I think that is possibly the conclusion they have come to themselves after –

**Q295 Paddy Tipping:** After some robust comments from you?

**Mr Deas:** Well, from somebody.

**Q296 Lynne Jones:** A bit earlier you said, when we were having the discussion about aquaculture, that fish farming required wild fish for food stocks. Of course, that does not apply to shellfish and other potential marine sources of food like algae and seaweed. Also in your evidence you pointed out that we actually do export large quantities of mackerel, herring and shellfish and you commented about the need to perhaps try and change demand so that people actually made use of these other sources of food. Also, you were talking about the Food Standards Agency. The Foods Standard Agency does not recommend two portions of white fish, it recommends two portions of oily fish, which to most people that means salmon and farmed salmon, which is perhaps where we got into the discussion about sustainability, and that if they were recommending that people eat salmon-like fish they

had some responsibility there. Who is responsible for encouraging the use of more sustainable but perhaps less traditional food from the sea?

**Mr Deas:** I think we all have a responsibility to do that, but I would say that there is a body within the industry, the Sea Fish Industry Authority, which is levy funded to do this work, to encourage consumers, as well as to eat more of the traditional stocks. I think the consumers' duty is to eat fish but I am not really very convinced that stock sustainability should be linked to attempts to persuade the consumer to eat this or that if they do not want to.

**Q297 Lynne Jones:** But mackerel and mussels, for example, in my view are some of the most delicious food and also very cheap. People do not seem to be aware of this in these credit crunch days, that they are cheap and really good value?

**Mr Deas:** I share your taste! Yes, I think the Sea Fish Industry Authority has a responsibility, even a statutory responsibility, to promote the consumption of particular species as well as the more general approach to increase the consumption of sea fish. I think that is very different from an approach, for example, from the Marine Conservation Society which has red lists. I think that is really straying into dangerous territory because, to date anyway, it has not been very accurate and actually can be very misleading. Too broad a brush is the general problem, as well as not being very up to date.

**Q298 Lynne Jones:** Should the consumer not know, though, whether the fish they are consuming is actually sustainable?

**Mr Deas:** I think the supermarkets tell us that the consumers want to be confident that they are eating sustainably and ethically and therefore, in the phrase which I thought was very interesting, "edit consumer choice". They take on that responsibility. So yes, and I do not think there is any getting away from it, but I think that is very different from having very detailed lists about which stocks, which species are in or out. Maybe it is possible to do this in a way which is fair and accurate, but it just has not been done so far.

**Chairman:** Barrie, thank you very much indeed. You have given us a good insight into current issues affecting fisheries, the Common Fishers Policy. It may be something which in due course, depending on how things go in the political cycle, the reform of the CFP, that the Committee would wish to return to because it is sometime since we did a major inquiry in that area, but thank you very much indeed for your contribution, as I say, both orally and in written form to give us a marine perspective to matters connected with food security.

#### Memorandum submitted by the Country Land and Business Association (SFS 01)

1. The CLA feel strongly that the food and environmental challenges faced globally, by the EU and of course by the UK too, have been underestimated by Defra. Consequently we majored on these twin challenges and the sort of Food and Environmental Security Policy needed to respond to the challenges in our Centenary Conference in May 2007. The paper summarising these ideas, *The 21st Century Land Use Challenge*, was published through our European association, the ELO, in June 2008 and was sent to the Committee before the Christmas break.

2. We are therefore delighted the EFRA Committee has decided to investigate these issues. We acknowledge that Defra have come a very long way in acknowledging the importance of food security issues in the last two years, but we feel there is still a gross under estimation in Government about the scope and role of policy, particularly the evolving CAP, to address this area.

3. Before we answer the specific questions raised in the announcement of this inquiry, it is important to put UK food and environmental security into their appropriate EU context. Curiously, the Defra papers on food security make practically no reference to this. We also offer our analysis of the events of the last 18 months which precipitated the renewed interest in Food Security and on which our own diagnosis of future policy needs is founded.

#### THE EU CONTEXT OF UK FOOD AND ENVIRONMENTAL SECURITY

4. We start from the observation that all the major policy levers affecting food security in this country are decided at EU level. We refer to the Common Agricultural Policy, the EU Common External Tariff (i.e. trade policy) and the fact that nearly all environmental policy affecting land use is based on EU directives. In addition the, admirably named, budget heading 2 of the EU Budget, entitled the “Protection and Management of Natural Resources”, provides the principal public financial support for the policies which shape our food and environmental security.

5. We would raise two issues which we have not seen aired in Defra discussions of food security which we think the Committee might consider.

6. The first concerns the uninhibited conduct of intra-EU trade in times of severe supply-stress. We ask, will the single market operate smoothly in such circumstances? Our presumption is that in the (somewhat unlikely) event of severe shortages of basic food stuffs in the EU there would be no legal way in which Member States could unilaterally decide to obstruct intra-EU trade to benefit their own citizens. This observation prompts two questions. What sanctions could the Commission or another Member State apply to illegal trade interference by a Member States in such circumstances? Would they be able to operate fast enough to make any difference? Because the UK is an island, with relatively few points of entry for bulk food supplies, there is perhaps plenty of scope for direct action which obstructs roads or ports, thus threatening UK supplies at times of stress. What remedies are available in such circumstances? What is the correct policy stance for the UK to take to guard against such eventualities? Our instincts are that these matters should be considered. It might be instructive to take liquid milk as a case study. It might also be useful for the Committee to take evidence from other EU Member States and from the EU Commission on this matter. If there is complete faith in the Single European Market then food security has to be considered primarily as an EU issue. If, as appears from Government documents, there is not such faith, then contingency plans for dealing with breakdown of the single market must be openly discussed.

7. The second EU matter concerns the role and scope of the EU budget. Our contention, spelled out in our document *The 21st Century Land Use Challenge*, is that the world faces an unprecedented double challenge of meeting a huge growth in food demand whilst respecting far higher environmental standards than in the 20th Century. We argue that the challenges are interrelated and both intensified by climate change. Further that the EU as a major economic and political bloc in the world has responsibilities and self interest in demonstrating how to rise to these challenges. The facts of EU competence for the relevant policies to deal with these challenges and that climate and biodiversity are trans-boundary matters justifies that these issues must be grasped though a common EU approach and our suggestion is that the CAP evolves to become Europe’s Food and Environmental Security Policy.

8. Such a policy, can steer Europe’s land management sector to achieve efficient, competitive, profitable primary food production whilst at the same time showing how intensive, precision, land management can deliver food security and higher standards of biodiversity delivery and reduced pollution too. Some of the principal elements of food security policy are to encourage innovation and modernisation, much research, development and extension, and to assist risk management. The measures for environmental security are to encourage, where possible, the creation of markets for environmental services from land managers and, because this will not do the whole job, to provide the schemes for public payment of private environmental service delivery.

9. The last step in our argument concerns the EU’s Budget and Policy review which was demanded by the European Council (December 2005). If this is to be a meaningful exercise to set the tone of EU food and environmental security policy for several decades, it must thoroughly analyse the nature and scale of the policy required to deliver Food and Environmental security for this period. Our fear is that short run political decisions about the deployment of the EU budget are being taken without reference to an analysis of the scale of the task demanded of EU policy, and thus the budget appropriate to dealing with this task.

## THE LESSONS FROM THE 2007–08 COMMODITY PRICE SPIKE

10. The events in commodity markets from late summer 2007 until July 2008 were remarkable for their speed and ferocity. Also remarkable was the speed with which most observers seemed to adjust upwards their expectations of future prices. There seems a broad consensus amongst private trading organisations and public authorities (HMT, EU Commission, OECD, FAO, World Bank) that commodity prices will remain during the next few years 40%–60% above their average levels of the last decade. In the meantime we can only observe that traded commodity prices are in fact back to where they were before the meteoric rise in 2007. Yet farm costs (e.g. fertilisers) and energy have not fallen back to the same extent, and neither also have retail food prices.

11. The CLA interpretation of these events is we have experienced a price spike comparable in scale and duration to that in the mid-1970s, and it is not yet clear that we are seeing a reversal of the long run, static or declining real prices of agricultural commodities experienced throughout the 20th Century.

12. The two main reasons we argue that the 21st Century will not be like the 20th Century are first the added dimension of the desire to extract renewable energy from land, and second the stronger environmental ambitions to reduce biodiversity loss and pollution. Both of these new features are driven by concerns about climate change.

13. It is clear to us that further intensification of agricultural production will be needed in many parts of the world because there is insufficient additional land which can be brought into cultivation and there is a steady loss of existing agricultural land to development and to sea level rise. This demands significant effort to discover and apply a whole new greener revolution which can maintain high levels of agricultural productivity but where the added soil nutrients and water and plant protection products are applied with such precision that the unwanted side effects on the environment (biodiversity damage, soil erosion, water pollution, GHG (greenhouse gas) emission) are all reduced. All scientific knowledge, including chemistry, biotechnology and ITC will be required to rise to this challenge. In addition, policy measures will be required to assist farmers to deal with the unprecedented volatility in market prices, input costs, exchange rates as well as the more extreme weather events and influx of new pests and diseases of plants and animals. A third major element of policy to provide food and environmental security will be the schemes to pay farmers and other land managers to supply the ecosystem services for which markets cannot be arranged. The latter two policy functions are interlinked; farming and environmental management both require a degree of stability they are long term processes, so the public payment for environmental services could well provide an important, solid, dependable, income base for rural businesses from which they can weather the erratic development of food markets.

14. Turning to the questions posed, our answers are as follows.

## HOW ROBUST IS THE CURRENT UK FOOD SYSTEM? WHAT ARE ITS STRENGTHS AND WEAKNESSES?

15. In international terms it is very robust. We are blessed with good soils, a temperate climate, good farm structures based on secure land ownership rights with flexible and well-based land markets and tenurial systems; a long history of innovation; highly developed and sophisticated, but also highly concentrated, input supply, food processing and food retailing systems; until the last decade or so, we have had a strong record of research and development and extension; and we have stable system of governance. Other strengths? The UK food system provides incredible safety, reliability and consistency of food supply to consumers to the extent that this is just taken for granted. It provides an incredible variety of foods, and the food service sector is highly dynamic providing a staggering choice of products and service. In addition the UK farming system provides the beauty of the English countryside which supports a large and renowned rural leisure and tourism sector including country sports which attract international participation.

16. All this said, some weaknesses at the primary food production level have emerged. Productivity growth has slowed. This is partly policy induced, and it is partly because of the changes to the research and development and extension systems. There are also concerns about the availability of seasonal labour. UK farmers also appear to be less willing to work together in strong producer controlled businesses than farmers in some other countries. We are also concerned about the availability and price of phosphate, and the investment which will be required in future to maintain land drainage system.

17. The other weakness of the sector—in common with the rest of EU agriculture—is the structural dependence on public subsidy. Direct payments under the CAP account for a significant share of net farming income. Without this assistance a very large proportion of EU farming businesses will not survive. Whilst in most of the rest of the EU this situation, including the subsidies, is accepted, in the UK and a small number of other NW European Member States, the overwhelming view outside the farm sector is that these subsidies are an unwarranted market distortion and should be eliminated. This is the declared view of the UK Government yet no analysis is provided to show the structural impacts, the effects on employment and output from agriculture, from the pursuit of this policy across the EU. We have seen no reference in Defra papers on Food Security to the implication of their own CAP Vision on the security of UK and EU food supplies. It is irresponsible of Government to advocate a policy without such evidence.

## WHAT ARE THE SUPPLY SIDE CHALLENGES?

18. We summarise the global farm-level challenge as that of repeating in the next half Century what was achieved in the second half of the 20th Century, namely more than doubling the production of food, yet this Century we must do this whilst reducing the environmental impacts.

19. The principal *soil* challenges we face are: returning more organic material back to the soil, restoring the levels of trace elements, reducing soil erosion and protecting soil structure. In addition we must do more to protect the mostly low-lying best arable lands from coastal erosion, riverine flooding and from development. More attention is needed to investigate low till or no-till farming techniques. RASE (Royal Agricultural Society of England) recently pointed out the worrying dearth of R&D (Research and Development) capacity on soils.

20. *Water availability*. Even with the climate change anticipated, the UK, as a whole, is not expected to be short of rain. The problems will be its distribution in time and space. Farmers certainly could, and should, find it easier than at present to construct reservoirs to catch water. They will also have to be more precise in their use of irrigation water. Compared to other EU countries and in other parts of the world the UK is expected to be less badly affected by climate change.

21. CLA is concerned that there has been an erosion of the *science* base for agriculture, as documented recently by Prof Leaver for the Commercial Farmers Group. This is especially so for the applied R&D and this is precisely the area where new production techniques are required to discover more sustainable farming systems with less water and atmospheric, i.e. GHG, pollution, less soil erosion and better utilisation of applied irrigation water and fertilisers, and plant protection.

22. Not only has the record on R&D deteriorated, but there is every sign that EU policy decisions will make this situation worse. We refer specifically to the current changes in the Pesticides Directive which will significantly curtail the availability of Plant Protection products which will reduce yields on average, removing very important risk management tools from farmers risking catastrophic crop failures when pests or diseases strike. This can certainly be seen as a step diminishing food security.

23. In addition EU stance to the use of biotechnology in farming is progressively putting UK and EU farmers at a competitive disadvantage as well as removing from them productivity boosting and risk management tools, and reducing the opportunities of decreasing their dependence on some plant protection products. There is a very clear signal sent to the agro-chemical and biotechnology companies from these EU policy stances, it is that there is no point in investing in new technology for Europe, it will be rejected. We consider this is another important dimension of EU policy on food security which is not well positioned.

24. *Training* in the farming and land management parts of the food chain has adjusted and consolidated significantly in recent years. There is a good mix of practical skills development via Lantra and Farm Colleges; vocational training courses, degree and post graduate training. The provision at University level has declined and restructured. Ad hoc professional development takes place in a fantastic variety of formal and informal courses, events, shows and conferences.

25. On *Border measures*, our principal concern is the insufficient resource applied to the prevention of import of disease which can threaten food security.

26. *The way land is farmed and managed*. The UK has admirably flexible arrangements which allow farmers to create businesses which can take advantage of the economies of scale in input purchase, machinery operation and land management. These include Farm Business Tenancies, farm contracting, share farming, cropping under licence, farming companies, partnerships and cooperatives. With some struggle, it has been possible to preserve most of this flexibility despite the Single Payment System which did not recognise this multiplicity of farming structures.

## DEMAND SIDE DEVELOPMENTS

27. Others will provide detailed analyses of consumer demand developments. One of our major concerns is that there will be no change in the major structural feature in food markets that nearly all the market power rests with the highly concentrated food processors and retailers. Successive reports from the competition authorities have shown that this market power is sometimes abused, but the remedies offered are extremely weak. CLA have long argued that a proactive ombudsman could provide some deterrent effect on the misuse of market power, but it will not fundamentally change the relationship between fragmented suppliers and concentrated buyers.

28. Of course the other side of the coin of highly concentrated downstream food industry is that it offers the firms great scope for efficient market servicing and the opportunity to deploy sophisticated storage, distribution and logistics. This in turn means that the major responsibility for ensuring the resilience of the food chain to shocks or disruption arising from any causes, natural, industrial action or terrorism, lies with these companies.

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 HOW WELL JOINED UP IS GOVERNMENT POLICY?

29. The CLA offers three examples relevant to Food and Environmental Security where policy is not well joined up across Government departments.

30. The first is that Defra is completely hamstrung by the Treasury stance on the EU budget—in particular that a major part of the budget for the CAP should be eliminated. This is essentially a political requirement that as the British Budget rebate is eroded the total EU budget has to shrink to contain the growth in UK contributions. The CLA argues that of course the nature of the CAP has to continue to adapt and change, we have outlined the directions above. The CAP has already undergone a massive change since the early 1990s, the days of unsaleable surpluses have long since gone, a significant part of the budget is now paying farmers for delivering non-market environmental and cultural landscape services. We contend that spending less than 1% of total EU public expenditures, or less than 0.5% of EU GDP on a policy whose fundamental purpose, we argue, is for achieving food and environmental security is not self-evidently barmy.

31. The second concerns the nature and survival of farm businesses through economic diversification. It is already the case that a very large number of farms have diversified their income base beyond farming. Defra data from the Farm Business Survey suggest that of the 60,000 largest farms in England which occupy a farmer for at least half his time, and account for 96% of total output, 50% have diversified activities which generated an average of 19% of total income. This is a very important part of farmer risk management. However the overwhelming experience of CLA membership is that this rural business development and diversification is not understood by the planning system but is often obstructed by it. Affordable rural housing is a related aspect of rural development where all is not as it should be and where Government policy does not recognise the links to Food and Environmental Security provided by viable rural businesses who cannot find employees who can afford to live in rural settlements.

32. The problem is that Defra's rural affairs policy and the rural aspects of the Department of Communities and Local Government (CLG) are simply not joined-up. This was illustrated in the simultaneous publication in 2004 of *Defra's 2004 Rural Strategy* and *CLG's Planning Policy Statement 7 on Sustainable Development in Rural Areas* which had little reference to each other. Our observations on this gap in communications were taken up in the Barker Review of the *Land Use Planning System* which flagged how the planning system was having a detrimental effect on economic development including in rural areas. Also Matthew Taylor's report, *A Living, Working Countryside*, pointed to important linkages between rural businesses, the need for housing in rural settlements and hence sustainable rural communities, which were not met by the current system.

33. The third example concerns renewable energy. The prime reason for development of renewable energy is to substitute non-fossil fuels for coal, oil and gas to reduce GHG emissions. This is fundamentally to increase environmental security—both in the sense of reducing climate change and increasing energy security. The UK has the fifth lowest share of energy coming from renewable sources in the EU. Unlike in other EU member states, where Government policy has engaged the land management sector in delivery of renewables from the outset, UK Government has come late to the challenge. Waste policy and anaerobic digestion remain in Defra, while Energy policy is made at DECC. The latter is staffed mostly by the former DTI team who have consistently made energy policy to suit large scale energy companies, rather than engaging the rural SME sector. Only now with a new Secretary of State at DECC do we see the signs of an emerging joined up energy policy that can help deliver on food and environmental security.

## CRITERIA FOR MONITORING FOOD AND ENVIRONMENTAL SECURITY

34. Defra have already launched serious work on the appropriate indicators for Food Security and we have commented in detail to them on their proposed measures. Our main concerns on their approach are the complete lack of reference to EU food and environmental security, and to the economic sustainability of UK farming businesses. The fact is that UK farming as currently structured is highly dependent on public payments.

January 2009

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**Memorandum submitted by the National Farmers' Union (SFS 14)**

## INTRODUCTION AND SUMMARY

1. The NFU represents over 55,000 farming businesses in England and Wales. It warmly welcomes the Environment Food and Rural Affairs Committee's decision to undertake an inquiry into the issue of food security and believes that this is an issue of global strategic importance.

2. There is a high degree of academic consensus that the world will need to increase food production by 50% by 2030 and by 100% in 2050 to meet the needs of a world population that is set to rise to nine billion and become steadily richer. This growth in demand for food will have to be met using a finite amount of agricultural land.

3. Climate change will invariably place further constraints on production in many parts of the world. A challenge for agriculture across the world is not only to increase food production but to do so sustainably.

4. The UK is relatively well positioned to play an even greater role in meeting global food needs due to its climate, soils and water availability. Yet all too often, consideration of food security in a UK context focuses on how the rest of the world can secure UK food needs rather than what UK farmers can do for world food security. It is therefore welcome that the Committee's terms of reference also pay attention to the wider global dimension of food security.

#### THE CHALLENGES FACED BY UK AGRICULTURE

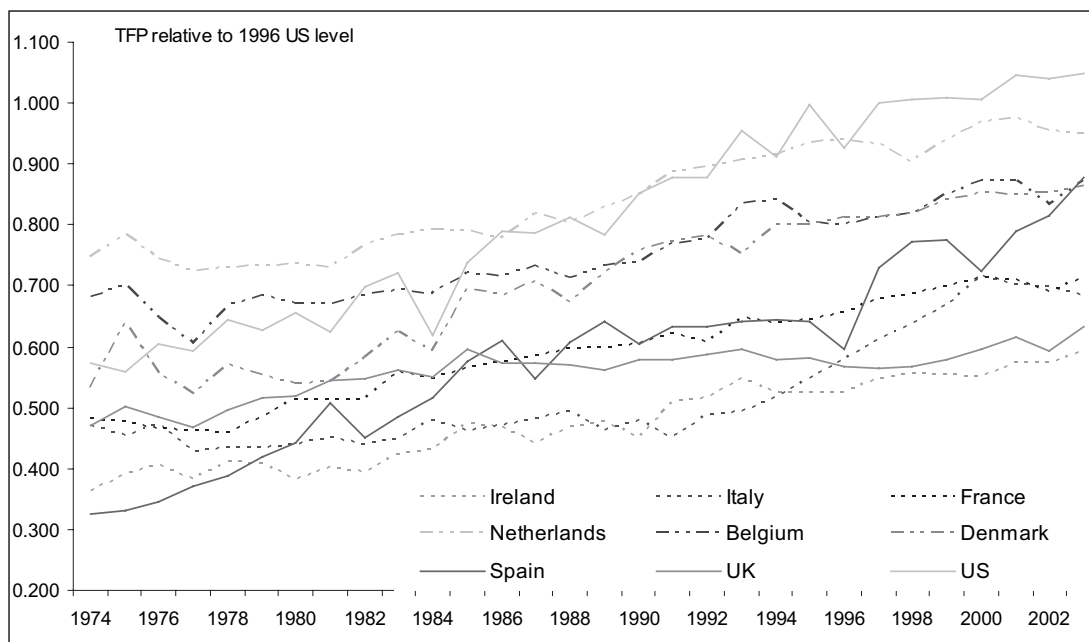
5. There has been a tendency on the part of Government to question whether UK agriculture needs to increase its production. The argument follows that:

- (a) Production must be demand driven. Recent market signals have been ambiguous.
- (b) Increased production may come at an unacceptable environmental cost.
- (c) Increased demand for food in the UK/developed world might be better met through creating markets for developing countries.

The NFU believes that any increase in production must be demand driven. However we do not accept the view that any increase in production need come at an unacceptable environmental cost. Our vision is that the UK farming industry must be in a position to gear up production substantially in order to respond to growing food demands.

6. An assessment of the UK's ability to increase production needs to take account of various factors including: land area, productivity, soil quality, water availability, farm infrastructure, routes to market, technical capability, exposure to external factors (e.g. farm inputs), and government policy. It is correct that the Committee seeks to examine what criteria might be used to judge the relative performance of the sector in achieving this goal and we offer views below on key performance indicators.

7. The NFU believes that UK agriculture and horticulture have a number of distinct advantages. Agricultural land in parts of the UK is of high quality and benefits from good growing conditions as a consequence of a favourable climate. Flexible rules surrounding land transfer and occupancy facilitate restructuring which allows the UK to create some competitive advantages through scale. Farmers have invested heavily in improvements in capacity, technology and resources yet the level of gearing remains modest compared to other industries. The industry has shown itself to be resilient and highly adaptable. Nevertheless, according to Defra figures for Total Factor Productivity, agricultural productivity does not appear to be keeping up with improvements in many other EU member states or the USA.





8. Science, technology, research and development are absolutely crucial to ensuring that growing demands can be met from limited land area. There has been a substantial cut in publicly funded agricultural science, in the UK & worldwide, since the 1980s, indeed a 45% real cut was seen in the UK between 1986–98. There is normally a 20 year lag between initial research and application, so the results of those cuts are now appearing. For example, European cereal annual yield improvements were in the order of 4% in the 1980s, 2% in the 1990s, and less than 1% currently. Ensuring that the UK excels and is globally competitive in fundamental research is one thing. Another is ensuring that the results are translated into practice. Whilst the UK farming industry benefits from a plethora of private sector consultants, it has lacked a single delivery vehicle for applied technology since the privatisation of ADAS (Agricultural Development and Advisory Service) in the 1990s.

9. Price volatility in respect of inputs and outputs is likely to be a persistent feature of farming in many sectors in the coming years. Volatility results from a very tight situation in respect of global demand and the difficulty in matching production cycles around the world to real changes in demand. It impedes the ability of businesses to plan and to make investments with a degree of certainty surrounding profitability and market returns.

10. Poor food chain relations. The best conditions for investment to increase production are long-term relations in the supply chain and relatively stable prices. Many sectors suffer from weak contractual relations, short-term attitudes, and price unpredictability leading to a lack of confidence and under-investment.

11. Imbalance in the supply chain. The growth of major multiple retailers has had many positive effects for consumers but it comes at a cost to producers where the power wielded by major retailers is abused. The Competition Commission investigation into the grocery market in the UK highlighted poor behaviour in the food supply chain, where retailers (and to some extent processors) force risk and margin pressure down to primary producers. In the face of this constant pressure, farmers find it increasingly difficult to maintain profitability, thereby reducing room to invest in greater efficiency and/or environmental improvements.

12. Inefficient supply chains. A report by the Food Chain Centre in 2007 demonstrated that the dairy supply chain, for example, was wasting £1.5 billion per annum in inefficient processes and supply chain practices. The lack of stable trading relationships is a causal factor in this as is a relative lack of investment in capital expenditure and R&D by some food manufacturers and fragmentation at producer level.

13. Labour availability. The relatively large scale of production in Britain compared to other EU member states means a greater reliance on employed labour. Labour shortages are a serious problem in some sectors, most notably horticulture. Migrant labour is essential to carry out often seasonal work such as harvesting and fruit picking. However, well established schemes such as SAWS (Seasonal Agricultural Workers Scheme) have been restricted (despite a welcome quota increase in December 2008) in size and scope. Although UK unemployment is rising, these are not jobs easily filled by British workers.

14. Skills and education. Farming is already a highly skilled occupation, but further development is highly desirable. The problem is that government training and skills policy is biased to qualification rather than skills, and many in the farming sector do not easily find the time or have the flexibility to acquire qualifications. Loss of critical mass is potentially a serious issue as lost skills may be difficult to re-introduce. With regards to education, the number of establishments offering courses tailored towards the farming sector has diminished although those that remain are well equipped in terms of the quality and range of courses offered.

15. Inappropriate European legislation. There are numerous examples of legislation agreed at a European level that are now outdated, disproportionate and not science-based. A good example is the Nitrates Directive. Despite UK rivers showing a declining trend in nitrate concentration, the Directive, agreed in 1992, continues to the ruthlessly enforced by the EU Commission. There are further examples of legislation that impact significantly on costs and merit re-examination at EU level such as the Animal by-products regulation and EU rules governing TSEs (Transmissible Spongiform Encephelopathies).

16. GMs. There are varieties potentially of great interest to UK growers which are closer to being ready for commercial use, but which will struggle to get approval due to the political controversy in the EU surrounding GM. Furthermore, the process for approval of GMs for importation that are not authorised for commercial planting is cumbersome; the current stipulation of zero tolerance for unapproved varieties in consignments shipped to the EU compounds this problem. A drawback of production in the EU is that it is relatively unsuited to protein production, which in turn is essential for feeding livestock and hence there is a dependency on feed imports. The growth in GM production worldwide, coupled with the approvals problems is likely to, increase feed costs dramatically.

17. Input availability. Fertiliser is an essential input in ensuring that the productivity of crops is maximised. Phosphate and potash are both in finite supply and whilst nitrogen can be manufactured, there is a reliance on natural gas which in turn exposes the industry to fluctuations in supply and price. The farming sector has made a tremendous effort to reduce its consumption of artificial fertiliser and make best use of farmers' own nutrients. However further skills and technology such as improved plant breeding and precision farming techniques which reduce usage will be needed. Electricity supply is also a serious threat

to some sectors, particularly if the UK fails to meet demand due to a shortage of domestic generating capacity. But the sector as a whole has the potential to be a net exporter of energy using biofuel, wind, anaerobic digestion of manures, crops and crop waste.

18. Water availability. This is a threat for some sectors and in some areas of the country. But the issue must be kept in perspective: less than 2% of our available water is used in agriculture; world-wide the figure is 70%. In 2005, irrigation in England consumed a mere 7% of the total amount of water leaked by water companies, demonstrating that a more significant issue is infrastructure. Large parts of the world have relied on finite aquifers rather than renewable precipitation (the USA, Southern Europe, North Africa) and this is another reason why Northern European production is likely to become more important in future.

19. Availability of credit. All businesses have become exposed to higher costs and lower availability of credit as a result of the credit crunch. A recent NFU survey indicated that, at the moment, agriculture is less affected than most other sectors. This is not to say that this position will necessarily remain as working capital requirements rise in 2009. Other parts of the food chain may be more vulnerable, which could knock-on to primary producers.

20. Animal Disease. The UK has had an unfortunate recent history. In some cases this seems to be the result of simple bad luck (BSE) in other cases failures of biosecurity at the national, and in some cases, farm level. Improving our performance is critical. Of particular concern is the failure in England to have a plan to eradicate bovine TB, with the result that whereas in most of Europe it is under control and declining, in England and Wales it is increasingly rapidly. Some 40,000 cows are likely to have been slaughtered as reactors in 2008. The direct impact on production of beef and dairy products may be relatively small but the indirect effects could be devastating leading many farmers to move out of beef and dairy production in the disease hotspots, which are precisely some of the best suited land in Europe for raising cattle.

21. Defra has given inconsistent messages about whether it is concerned for domestic production. The Secretary of State recently made a welcome statement about the importance of domestic production at the 2009 Oxford Farming Conference. Defra has also taken a firm line in support of the industry in respect of new proposed EU legislation covering pesticide approvals. However, Defra's inability to tackle bovine TB and its determination to replace set-aside with a similar measure, with little regard the impact on production or administrative burdens demonstrate that policy is frequently at odds with food production.

22. The CAP. The EU's Common Agricultural Policy has reformed massively in recent years. The vast majority of support payments are decoupled from production and a greater proportion of the total budget is being devoted to environmental improvement and business support measures. However differential implementation throughout the EU creates some competitive distortions which hamper UK producers, especially in the livestock sector. It is likely that further substantial reform and reductions in the available budget will occur after 2013. The UK must guard against any renationalisation of the CAP which could result in further distortions.

#### *Actions to be taken*

23. The farming industry recognises that it must take ownership of many of the challenges it faces. It has already made big strides in responding to market signals, embracing new technology and enthusiastically adopting measures, such as the Environment Stewardship Scheme, that improve farming's environmental footprint. Further examples, from the creation of an agri-skills forum, to the ongoing work of the industry Climate Change Task-Force, demonstrate that in many cases, the industry can work to overcome challenges. However not all of the challenges are surmountable through industry effort alone.

24. In many sectors, the industry has benefitted from the provision of "market failure" services by the agricultural levy bodies. The creation of the AHDB (Agricultural and Horticultural Development Board) leads not only to synergies in the delivery of important services but a chance to improve further the level of industry investment on cross-sectoral R&D and especially technology transfer.

25. The farming sector can only go so far in terms of driving forward science and technology. The UK has for many years been seen as a seat of international excellence in science and technology in agriculture (institutions such as the John Innes Centre and Rothamsted Research are testimony to this). However this risks being undermined by the progressive reduction of government support for R&D in agricultural production. There is a very urgent and pressing need for this long-term decline to be reversed in order to maintain the UK's leading position and to ensure that its farmers have access to the best available technology to improve productivity and the environment.

26. The withdrawal from managed markets and risks of volatility make it even more incumbent on the supply chain to provide clear, long-term signals and better, stable relationships. There is still a staggering lack of appreciation by food manufacturers and retailers of the role they must increasingly play in securing supply by ensuring long-term contractual relationships with farmer suppliers.

27. Furthermore, measures need to be taken to prevent abuses of power from further undermining the fragility of the supply base. A strengthened Code of Practice and an independent ombudsman have both been recommended by the Competition Commission as remedies.

28. Defra has, to its credit, expressed a keen interest in food security. Some good initiatives have been taken, most recently the creation of a unified science hub within Defra. However, we detect some confusion even within Defra about the various strands of work that are taking place within the department. Examples include Defra's July discussion paper on food security and workshops on indicators, the Farming for the Future Programme, the Sustainable Food and Farming Strategy together with regional delivery programmes, the recent creation of the Council of Food Policy Advisors and the outcome of the Prime Minister's Strategy Unit report on food security of July 2008. We believe that there is a need for some better co-ordination of this work.

29. Defra has recently been given an enhanced role in co-ordinating food policy across all government departments. It is important that Defra seizes this role to champion the needs of the UK farming and food industry in the same way that BERR appears to do for wider industry.

30. There is inevitably a tension within Defra between being the department responsible for implementing environmental policy and being the sponsoring department for food and farming. At the heart of Defra's policy orientation is the Government Public Sector Agreement relating to resource protection (securing a healthy environment). This is undeniably important but should, in our view, be balanced by an objective relating to domestic food production. Until this happens, it will remain challenging for balanced policy decisions taking due account of food production to be reached.

#### INDICATORS

31. A necessary precondition to identifying and agreeing indicators/ measures of success in relation to food security is a balanced Public Service Agreement in respect of food production. Leaving this aside, there are a number of valid measurements of UK farming's capacity to respond to food security needs. Defra already collects data in respect of productivity and this should be closely monitored. Capital expenditure levels are also a useful benchmark in understanding whether the sector is investing for future growth potential.

32. The NFU agrees with the view that food security does not equate to food independence. British consumers have diverse demands for foods that cannot always be produced in the UK. The UK therefore cannot secure 100% of its food requirements from domestic production. However in respect of indigenous production, the UK should aspire to producing as much for domestic consumption as possible. It is therefore important to continue to monitor self-sufficiency levels in the UK.

33. In 2007, the NFU recommended an early warning system whereby production levels in each key sector are monitored against those in the rest of the EU. If production were to fall in a given sector we advocated that this should trigger a joint investigation between industry and government into the reasons why. If the reasons were a result of the inability of UK farmers to improve their competitiveness, then it would fall on the industry to decide what measures might be taken to address the issue. If the problems lie in the operation of the food chain, that is where the remedy should be sought. However if the investigation demonstrated that the fall resulted from the application of legislative requirements specific to the UK then Government should be compelled to assess whether those requirements should be amended. The NFU believes that these policy recommendations are even more relevant today.

*January 2009*

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*Witnesses: Mr Henry Aubrey-Fletcher, President, Professor Allan Buckwell, Policy Director, Country Land and Business Association; Mr Peter Kendall, President and Mr Tom Hind, Head of Economics and International Affairs, National Farmers' Union, gave evidence.*

**Q299 Chairman:** May I formally welcome our next set of witnesses, on behalf of the Country Land and Business Association, Henry Aubrey-Fletcher, their President, supported by Professor Allan Buckwell, their Policy Director. You are old friends of the Committee and you are, again, very welcome. Equally old friends are the National Farmers' Union in the shape of their President, Peter Kendall and Tom Hind, Head of Economics and International Affairs. At least, Peter, you are still here because every time I pick up a journal from the Union I find that not only is Mr Holbeche going but now Mr Macdonald has decided to go and leave towards the end of the year. Soon there will not be very many people left who we remember, but nonetheless we are delighted that you are here, so that is very good news. Thank you both for your written submissions.

They were stimulating in their own individual approaches. Just to put matters into context, this inquiry came about because of the price spike in food after a period of falling real returns over perhaps a decade and the holding in Rome of the FAO conference, which focused a global dimension on the questions of food security, and arising out of that conference were two key challenge targets, one of which was increasing food production on a world basis by 2030 by 50 per cent and doubling it by 2050. Everybody immediately took that as part of the new language that we have to speak on these matters. I just wondered whether both of your respective organisations accept those targets as valid broad brush estimates of what the likely demand for increased foodstuffs is going to be over those two respective timescales.

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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**Mr Kendall:** First of all, Chairman, thank you very much indeed for holding this. It is something which has been very much at the heart of our organisation about the importance of agricultural production and we really do appreciate your Committee picking it up and running this inquiry. Again, as a point of reference, Professor John Beddington has been quoting those exact same figures on a regular basis. When I look at the instruments and the research capabilities of the rest of the FAO and the chief government scientists, we are not able to drill down in great detail and make further predictions. I think what is an area of concern for all of us is what is the impact of the current economic slowdown, what is the impact of this global recession, what is going to happen to the speed of growth moving diets in East Asia, and what have you, and what is going to be the development of renewable fuels, but the latest assessments are that we need to meet those sorts of targets. That is the backdrop to how we, certainly at the NFU, are developing our thinking.

**Mr Aubrey-Fletcher:** I suppose we have not had any information to the contrary. The Government's own chief scientist and Professor Bob Watson, the Chief Scientific Adviser to Defra, are both saying the same thing and the evidence from other sources and what you read in the papers does seem to be fairly unanimous and for organisations like ours, if we cannot believe the government advisers I do not know really who we could believe.

**Q300 Chairman:** That is quite reassuring, that we have got some parameters that, if you like, can be agreed on because one of the questions which has come out is that everybody has embraced these targets and, Peter, I think in a number of your speeches you laid emphasis on the opportunity for agriculture in this country to take its share, to make a contribution, to respond to those targets and it set me thinking: as a fundamental and taking into account, if you like, the re-engagement of Defra in the subject of food after an absence of some time—they may not see it that way, but it certainly seems to me to be—how do we actually set out our stall to do this responding? I say that against a background where the reforms of the Common Agricultural Policy and the CLA—in your evidence you put strong emphasis on the need to continually recognise, as I see it, that the parameters of policy are very much determined in the first instance by what happens within the EU and within the context of the CAP. So taking that as my boundary, how do we set out to respond to this challenge, bearing in mind the movement in the CAP is away from a system of funding which produces a production response to a system of money going into agriculture, perhaps for agri-environment reasons, effectively the Pillar 1 to Pillar 2 movement, which is supposed to lead farmers to make commercially-based decisions which will be dictated by what the marketplace says. I suppose what is at the back of my mind is that if you are looking at the demand increases to meet those targets over the timescale we are talking about, the actual degree of change year upon year is actually quite small. On the other hand, if you are

gearing up long-term investment in agriculture you may have to start doing it sooner rather than later. So how do we set out our stall to take our share of the increased demand on a world basis for food against a background of a less interventionist CAP?

**Mr Aubrey-Fletcher:** Our view, as you will have seen from our ELO document *The Great Twenty-First Century Challenge*, is that we have got to zoom out and look at this not just in a UK or British context, or a European context, but in the global context of the world and where it will be by 2050. If you believe all the figures—and you know them as well as I do—the world could run out of food by 2075 unless there are some sort of changes. The point really is that we live in a temperate zone, the Northern Hemisphere, and Northern Europe is very well placed to produce food because it has the rain and the soil types, it has the technology and the expertise and it is an advanced part of the world, and you have got other parts of the world with temperate zones where they can too. The difficulty is at the moment Europe is fine, it has got plenty of food, it produces more than it needs and it is effectively self-sufficient—not in all foods, but basically it could feed itself. But as years go by and climate change does what climate change is going to do, other parts of the world, due to water stress and all the other things you have read about, are not going to be able to produce all the food they need. If we get to a situation in Europe where we cannot or decide not to protect our resources, our land, the facilities we need to produce food in the future, we are not going to be able to produce food for other parts of the world when the need comes. From our point of view, we have been looking at this, as you will see from that paper, in a very long timeframe. This is protecting resource to produce food into the future. We cannot create more land. We cannot create more water, we are going to have less. The issue, I think, as far as the Government is talking about in food security, is more about how we are going to provide food to feed our people in the shorter run. Is the food going to be there for them to eat? They are two opposite ends of the spectrum. You are talking about, I think, the shorter term, how are we actually going to reconcile increased food production in Europe, looking after the environment and doing all the other things we want, which is a big challenge. The last time we did it, we did it inappropriately. Very successfully from the point of view of food production, but probably inappropriately in terms of the environment. We cannot do that again. So there is a huge challenge to be met in doing exactly what you suggest, but it is big picture stuff.

**Professor Buckwell:** Could I add, the policy dimension to this is that if there is to be more European production it will not be policy stimulated, it will be market stimulated. We achieved the food production for an increase of 2.5 billion global population in the last 50 years. We have got to do it again in the next 50 years. We did it in the last 50 years with real prices declining throughout those entire 50 years, apart from a spike in the 1970s and a spike last year. What is different in the next 50 years is, first of all it is harder to do it because we have used

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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all the best land. Secondly, because we are being much fussier about the environmental impacts, especially us in Europe. We have set very demanding but entirely proper targets for water quality, atmospheric pollution containment, biodiversity decrease, stopping the decline in biodiversity, and so on. So there is the real challenge and that is why the policy will be mostly directed to the non-market problems which achieving that additional food production, whilst looking after the environment, demands. Fundamentally, the answer to your question is, it will be a price signal and if the prices do not rise then you will not get the production in this part of the world, that is for sure.

**Mr Kendall:** We do obviously see the importance of the European role in this, but we certainly do not believe that the levers lie all in Europe. We think there is a major role for the UK Government and we think it needs to start now and to change its emphasis quite significantly. I use the example about the goals within Defra and since the removal of climate change back in October and the renewed focus on food it still only has one PSA, which is about securing the natural environment. There is no target in there about productivity of food production, about our competitiveness, about the way we compete, and although Allan is absolutely spot on that we want to see market signals driving, when I look at the tools and instruments which we have to use, boy, we have got plenty to play with and which I think Defra and the Treasury working together can put the sort of stimulus in place that sees us investing for the long term. We have done plenty of papers on the *Why Science Matters* in different sectors. The productivity of agriculture, four per cent a year in the eighties—we did a launch of this inquiry—two per cent in the nineties and John Beddington says today below one per cent per year growth in productivity. So we want to find a way which re-engages in the research and development agenda because there is a lag and a number of people acknowledge there is a 20 to 30 year lag on productivity growth when you cut back the R&D. This occurred during the eighties and nineties and we are paying the price for it now. I want to look also at ways in which, not just R&D but incentives, to get farmers investing again. An example I have repeatedly used is that at a time when we are trying to drive productivity, when we are trying to drive investment for both welfare and the environment, the Government has removed agricultural funding allowances, tax incentives to put better structures in place at exactly the time we should have them. Of course another issue which I have appeared before you about is animal health and how we tackle animal disease and management if we are going to be feeding ourselves from food here. This is not about meddling in the market, setting precise targets, and I do agree that the signals were deliberate. What we should be doing is facilitating the ability for the industry to respond to those signals and there are lots of areas where the Government could also get involved with its flood defences, drainage. I came from the United States on Monday morning this week. On going into the United States, I got stopped

and my bag searched. People take food disease very seriously. I came in without a mention of food as I entered the United Kingdom on Monday morning. I think we can take food production much more seriously.

**Q301 Chairman:** Do you think we have the political structures to deal with the long-term nature of this particular problem, because one of the things that strikes me, if you take the nearest of the targets, the 2030 target, that is 21 years and some of the things to which you have referred will take quite a long time to restore to full health. Without going into detail, because we will discuss it later, but for example the whole scientific agenda. You mentioned productivity. A lot of the work which may have to be done on plant breeding, et cetera, things with which you are very familiar, they require a sustained policy support but the political cycle is merciless as far as that is concerned. It runs on a sort of four or thereabouts year cycle where change could be the order of the day. How do you think we should safeguard the long-term nature of what needs to be done if the policy direction says we want to remove barriers to UK agriculture being able, as Allan Buckwell counselled us, to respond to the market signals?

**Mr Aubrey-Fletcher:** I totally agree and I am very glad I am not a politician because there are no votes in long-term work on food and environmental security as there are challenges on achieving that with carbon emission reductions and greenhouse gas reductions. People are not keen to do that. It is going to cost money, et cetera. If there is food on the shelves in the supermarkets they are fine, they are happy, and price is an issue. If there were empty shelves, then of course that would be an extreme political issue. I think that is a real challenge and if we somehow have to find a way of getting all the political parties to accept that in Britain we have to play our part within Europe to ensure, as I said earlier, that we have all the building blocks in place to be able to grow food not just for this generation but for the next one and the one after that, and I do not know how you do that politically without having some kind of all-party long-term consensus to achieve that, similarly to the way you are doing it with climate change.

**Q302 Chairman:** I suppose I might just float the thought that in terms of long-term environmental policy we have got the Environment Agency. The Government, if you like, sets the legislative framework along with Europe and then the Environment Agency gets on and does the necessary. We have got the Food Standards Agency, the FSA, which deals with those. Do you think there is any merit in having a sort of, let us call it the food security agency for the sake of the conversation, but actually having some other body to sit out with Defra to keep the pressure up on the long-term agenda?

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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**Mr Kendall:** If I can deal first of all with the previous point, I think it is worse than the four year cycle. I am on my third Secretary of State and third minister –

**Q303 Chairman:** You wear them out too quickly!

**Mr Kendall:** -- in the three years I have been doing this job, so actually getting some sort of continuity is just not there. I am sure I do not expect the Committee to read my comments at our conference two weeks ago, but I made exactly such a call for long-term thinking.

**Q304 Chairman:** You did.

**Mr Kendall:** I quoted Churchill, who in 1953 sat there and said that agriculture should not be a political issue, it should be a national issue and saying that we do need to pull together and try and take the long-term view. We believe with things like climate change we are managing to move beyond that. If we are not careful, we pass the responsibility on to somebody else and what I do see is Lord Mandelson—I am being very careful about somebody who is championing the industry, but I see a minister who is actually saying he wants to help the regulation and he is determined to help businesses get through the current challenges we all face. That is what I want to see the minister in Defra doing for agricultural production, getting behind us and saying, “We need to challenge this regulation, make these changes to help this industry succeed and fulfil its potential.” What I am concerned about—and we have some tensions between other bodies, whether it is the Environment Agency or Natural England—is that if we are not careful they would be just gnawing away at what the main ministry was doing and I want the main ministry, the main Secretary of State to be getting behind and putting the case for, and hopefully buying in some long-term objectives from other parties. The more certainty that is put around the enormous challenges and targets we face, we should be able to agree some sort of long-term strategy for the industry, particularly in the investment in R&D which I think needs that long-term commitment.

**Q305 Chairman:** Just finally, you touched upon the policy levers that Defra has and you touched on one or two specific areas, but would you like to just go into a little more detail about what you think Defra’s strengths are in terms of the levers it does have at its disposal to influence this agenda within the context of the kind of timeframes you have just discussed?

**Mr Aubrey-Fletcher:** One of the things we have got to do if we are going to deliver food and environmental security going forward is that we have got to be much smarter at doing it than we have been in the past. We have touched on this. We have not spent anything on developing agriculture really in the last ten years because food security has not been seen to be a problem. We do need to invest now in cleverer ways of producing food that are less damaging to the environment. There are lots of ways of doing that and I think Defra could take a lead in that. They could help over the protection of the best

agricultural land. For example, do we see Defra saying, “Why are you developing over this really good land? Why is it more important to have houses there than to protect that land for the future?” and engaging with the departments responsible for planning in that sort of debate. There is a very interesting issue over flooding, for example. We have 58 per cent of grade 1 land in this country five metres or less above sea level. The mechanism for valuing that land as to whether it is worth protecting or not is based on land and property values, it is not based on whether that land is important to produce food in the future and maybe that is an area where Defra should be looking to have a stronger role in raising the bar in promoting the protection of the land where it is sensible. All the infrastructure that is necessary to do what we have to do. For example, we have not got enough slaughter houses and it is miles to send animals to be slaughtered. Do we see them trying to fight in Brussels to find better ways of regulating slaughter houses so that we can have more of them in closer places? So there is a role for them to play in promoting sensible things in relation to producing food. At the moment, as we all know, they tend to, as you said yourself at the beginning, focus on the environmental issues far more than they do on food issues.

**Mr Hind:** I think when we start looking at this at a European level, clearly Defra has a role to play in trying to influence the design and shape of European policy and legislation. In some respects it has performed a reasonably good role. It has not always been successful, as the recent episode over the pesticide approvals regulation shows us, but clearly it has an important role to play there. Secondly, it has a role that follows on from that in how the implementation of legislation then takes place on a national level, and of course we can look at a number of different examples where Defra has probably done a relatively good job. Other areas where Defra may or may not do as good a job—and one of the issues which of course is very topical at the moment is how the English administration will seek to implement the CAP health check decisions, particularly in respect of cross-compliance where there are proposals presented today which will potentially require farmers to manage a proportion of land under cross-compliance for environmental purposes and some questions will need to be asked about whether that is a proportionate response to the environmental issues associated with set-aside, but also equally, as we said earlier, with regard to food. As Henry said, Defra also has at its disposal a substantial budget. Okay, all government departments are challenged in these current economic times in respect of their ability to spend, but clearly there are some core priorities, flood defence being one of them and animal health and animal disease surveillance being another. But there is a third and of course the really important one for us is in respect of research and development. Where does that money come from, you may ask. Should it be coming more from the private sector? The private sector has invested millions and millions and millions, increasingly in the last few years, and I

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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think one of the issues we probably should consider is the extent to which the public and private sectors ought to be working more closely together in terms of what kind of research priorities are necessary for the future. I guess the final thing I want to pick up on in respect of the kinds of policy levers is coming back actually to the EU budget. Notwithstanding the debate that will necessarily take place about the future of the CAP, the process for discussing the future of the European budget as it takes place later on this year is designed to start from the basis of what kind of outcomes do we want from European policy, and I think there is a very strong and legitimate question to ask about the role that research and development should play across the European Union in the context of the amount of money that is concentrated towards R&D.

**Q306 Lynne Jones:** In the NFU's submission you commented that the UK productivity has failed to keep pace with improvements in Europe and the US. I know you have been highlighting the decline in research and development but that has been the case across those countries as well, so what do you think the factor is there? How have we been less effective than they are in increasing our productivity?

**Mr Kendall:** There are a number of areas. I think there is a spirit of collaboration in Europe which has certainly helped to an extent. I see in the United States a massive uptake in private research and development driving change. Certainly if you look at some of the adoption of new plant technology in the United States you see a big response in productivity growth from that. They call it the creation of virtual acres because they are investing in smarter technology. So although you ask why there is an impact here in the UK, one of the things we called for as an organisation two years ago now was an early warning system where actually we analyse what is happening to our productive capacity, whether it is falling or declining within individual sectors, and we drill down to find out what the cause is. Is it the availability of seasonal labour, is it the way we implement regulation, is it the way we have reformed the CAP? It could ultimately be, are we as farmers failing, and if it is we understand we have got to get our act together. Is it that we have not got the training and the resources, or are we not investing correctly on our part? What I do want to do is to have a way of monitoring what is happening to our relative productive capacity, to drill down and identify the cause and where it is us we can pick up the mantle to put it right.

**Q307 Lynne Jones:** So there is still a lot of analysis to be done then you are saying on where you have gone wrong. If we are going to have to gear up our production substantially, what does this mean for the environment? You have actually said, I think, both of you, that we can do this in a sustainable way so what are the main ways in which we can achieve this, would you say, and who should be driving these changes?

**Mr Hind:** Just to take a step back, if I may, to supplement Peter's point on the previous question, I think there are probably two other relevant factors to bear in mind. One, I think, is the availability of extension and that is across the agricultural sector. If you take the example of Ireland where you have a publicly funded body in Teagasc which is fulfilling a role in terms of trying to transfer the best available research and techniques on to farmers. Within the UK that is very much devolved to the private sector. Certainly within Great Britain it is devolved very much to the private sector and although some farmers have availed themselves of private services where they can, of course that does not happen necessarily across the board. It could be asked whether that is really a responsibility of government. I think there are some questions about how much the industry does itself to actually improve the level of knowledge transfer, but certainly I think knowledge transfer is likely to be an important issue. I guess the second relevant issue as well is the level of investment that has taken place on farms within the UK, and certainly something which is worth us looking at more deeply from an NFU point of view is whether the level of capital investment that is taking place on farms in the UK is comparative or not to other EU Member States. I have a suspicion that it probably is not as comparative and that might reflect the more difficult market trading conditions we have experienced in this country compared with elsewhere in the EU.

**Q308 Lynne Jones:** It has been pointed out that a lot of our diet consists of meat, which obviously requires much larger imports. In terms of food security for the future, where are our areas of agriculture where we should be seeking to expand if we are going to meet sustainability criteria?

**Mr Kendall:** If I can pick up on that at the same time as your previous question about whether we can produce more without damaging the environment, I think there is great potential for smarter technology using precision technology, precision farming, where you actually very precisely put the right ingredients in the right place and the right quantities. We are now able to do that through satellite guidance, GPS systems. We are able to have better technology in how we protect the soil through low ground pressure tyres, the investment in the right sort of machinery, and I think the majority of our soils that are not on permanent pasture offer themselves to be farmed in a smarter way. The potential of wheat is 19 tonnes to the hectare. The UK average today is just over eight tonnes to the hectare. For oilseed rape the average will be about three and a quarter and the potential is nine. This is through actually targeting it in a much more precise way and using smarter analysis to find out the timeliness of those applications. So the soils I see as a great potential. The concern I have on, I fear, the over-simplified analysis of meat is that some of our most fantastic landscapes are extensively grazed grassland where we are producing the best quality meat products I think you get anywhere in the world. That does compare differently to the large farms that are corn fed based in, for example, the

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**4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind**

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United States or South America. So I think it is an over-simplified analysis to say that meat is bad and grain is good. I think that is an over-simplification.

**Q309 Lynne Jones:** But we are importing a lot of soya, are we not, to feed animals and that has environmental consequences? I read recently, I think, that there is a promising development in yellow Lupins as a home grown animal feedstock. That is an example where research can actually improve our home grown food production.

**Mr Kendall:** I fear we are moving to another contentious area, but there will be 700,000 tonnes of distillers dry grains as a by-product of the biofuels industry, high quality protein feed that will be replacing imported protein sources from the middle of next year and one plant taking in 1.2 million tonnes of wheat will be on-stream in the second half of this year. That will be producing about 400,000 tonnes of high protein feed. Another one will be on-stream next year. So by actually using some of our surplus grains that we export currently in a renewables industry here we will be replacing imported protein. So that is one way of reducing that dependence on imported soya.

**Q310 Lynne Jones:** But we do also have to think of the global consequences. If we are exporting less, we have some small contribution to make to that. So is the take home message then that we can actually improve our productivity substantially without actually encroaching on additional land, that we can be more productive on existing agricultural land?

**Mr Aubrey-Fletcher:** Yes, improving productivity and being smarter, as Peter quite rightly says, is fundamental, but there is the other side to it and that is, how can you address the market failure that is the environment? The public do not want to pay for the environment through what they pay for food. They want to pay for their food. Every attempt we have made to add value to what you pay in the shops that links back to the environment on the whole has failed and it is a very fair question. If we are talking about food and environmental security, how are we going to deliver that? We are beginning to do some work on the deliverables and I think Allan will be able to tell you about that.

**Q311 Chairman:** Can I just ask, before we leave the point, you said that the genetic potential of wheat was 19 tonnes per hectare. How do we get from four and a half to 19, over what timescale, and is that done with, if you like, the exploitation of existing technology and not moving into GM or anything like that?

**Mr Kendall:** The current strains have the potential to be up to 19. In the nice parts of East Anglia we do ten already, so the fall is in oilseed rape. In wheat, the average in the UK is over eight already but in a number of areas this year it will be towards nine as an average. So we have, I think, the technology. We know that plants, managed in a very precise way, can do that. However, I am conscious that when we look at GM there is another whole area to move into.

**Q312 Chairman:** Let me just park that for a second. If I said, "Okay, take me through the path from ten to 19," over what timescale would there be a very substantial grain drama in East Anglia? If you said to them, "Okay, you have got to demonstrate you can do 19," how long would it take them to get up to speed?

**Mr Kendall:** I would not even want to try and hazard a guess. I do know that the world record wheat crop I think was grown last year in New Zealand, which was 16 tonnes to the hectare. Now, you cannot—as I think we have seen from two very difficult summers—bank on the fact that we are going to deliver that. However, with the right sort of research and technology, without the right extension services, as Tom has said, giving the advice to farmers, we need to learn how to do things differently. There is some great work going on in Bedfordshire on controlled traffic systems where you actually stay in the same avenues the whole time and because you do not travel on the growing land it is in a much better state than when you use tractors and run along the ground on a regular basis. There is a whole load of areas we need to address as we try and unlock that genetic potential.

**Q313 Chairman:** Just one final technical point. If you were gradually increasing the amount of yield per acre, could you do it with the same risk profile as you would have at the moment? In other words, do the risks of failure keep in proportion to the increase in output?

**Mr Kendall:** I think if we are investing more into growing the crop, by definition the risks get higher because we work outside, we are not working in factories, and we have an unknown climate in which to produce it. That is what makes farming the exciting challenge that it is. So, yes, if we are going to look to target, to put more investment into the right machinery and the right technology to apply in a very precise way those required inputs of nutrients, then the risk will be greater because you are spending more to get that greater output and things can go wrong, as we saw last year.

**Professor Buckwell:** This is a fascinating discussion because what Peter quite rightly is pointing to is that we are nowhere near the potential productivity of our crops, plants and animals, but of course the average achievement will always fall a long way short and the trick is obviously to try and get that up. But on the question, can we do more without more environmental damage, the answer has to be, yes, because if you answer "No" to that you are saying that the world is going to be even less well fed than it currently is, instead of a billion malnourished there is going to be more, and you are saying that instead of having the current level of environmental damage we are going to have more. I think societies do not want that. It is our job to find the technology, to find the agricultural structures that deliver this. We do not have any choice. So the task is to give us the tools, to do the research and to get the research out into the field. As Henry and Peter have said, the critical question is, who is going to pay for the research and development and what are the



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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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mechanisms for getting that out into average practice to get average performance up, and where is the investment coming from for this? The presumption is that if that demand shows up, the higher prices are what will drive this process and drive the signal that we have to deploy more resources to these things because high prices is the signal of scarcity. On the other question about the livestock production, this is obviously a real issue and nobody is trying to duck it, but the question is, if we do not like the consumption choices our citizens make when they are free to decide how to spend their incomes, in a sense it is for you legislators to decide what you are prepared to do to guide those decisions. We will obviously, as farmers, deliver what the market asks us to deliver, though we happen to think we can deliver an awful lot of red meat without imported protein because we can have grass-based, high-quality beef and sheep meat which is actually liked by our consumers, and long may it be the case. But this issue about consumption choices is a political issue. Of course we are interested in what decisions you make about that and we will express our views, but I throw the question back: what are the instruments you are proposing to use? Taxing dairy products?

**Q314 Lynne Jones:** If we had a pricing similarity –  
**Professor Buckwell:** I think you will find it quite difficult to do that. As Henry said –

**Q315 Lynne Jones:** If we had a carbon price –  
**Mr Kendall:** What we do is we put a price on UK production and we therefore import where people are not putting those costs. In effect, what we do is we contract our industry here and import the pollution because we allow it to be produced somewhere else. I took my eight year old son to Manchester United and when we see them all coming out and queuing up for the beef burgers and hot dogs it would be an interesting debate for the legislators to say, “You can’t have your hot dogs” –

**Q316 Lynne Jones:** If you had a carbon pricing mechanism it would have to be an international system really, would it not?

**Mr Kendall:** Yes.

**Chairman:** Paddy has a supplementary on that.

**Q317 Paddy Tipping:** Can we just pursue one of Professor Buckwell’s comments, which was said with a great deal of enthusiasm and commitment, but there are people, are there not, who argue for a more kinder, gentler, less intensive kind of agriculture? Are you saying they have lost out in the debate?

**Professor Buckwell:** What I am saying is that the high quality, premium products, which tend to be associated with words like “organic”, “local”, “Fairtrade”, “ethnic foods”—do you know what the share of those four is in total consumption at the moment? Just 3.9 per cent of consumer expenditure. Despite the air time that is devoted to promoting those areas, the 3.9 per cent has grown by about 0.7 per cent over five or six years. As far as I am

concerned, those movements are a highly intelligent segmentation of the market, differentiation of the product, trying to add value, trying to get customers to be interested in where the food comes from. Power to the imagination and the elbows of the producers who are doing a fantastic job supplying those things, and there is always scope to do more, but you are starting from less than four per cent now after all the publicity those quality foods have had. We have been discussing this in the context that we have got to increase production, so I am saying let us have a perspective on the role of this gentler production. I think even environmentalists are beginning to appreciate that if the choice is that globally we are going to double food production by 2050—and nobody is disputing the numbers broadly speaking—are you going to do that by doubling the land area or are you going to increase productivity on existing land, or what mix? Either way, there is a potential cost to the environment which we have to face up to. There is no environment damage potential free route here, so therefore what we are saying is that through the sorts of techniques that Peter Kendall is talking about where we are learning how to do smarter farming, we have got to learn even more how to do even smarter farming.

**Q318 Paddy Tipping:** Let us stick with that for a minute because the NFU in your evidence say you can have increased production without damaging the environment and, Peter, you reminded us about livestock farming on grasslands. There is a long history of over-grazing, is there not? There is a balance to be struck and it is Allan’s point that production and potential environmental degradation go together.

**Mr Kendall:** One of the biggest challenges at the moment is under-grazing, actually.

**Q319 Paddy Tipping:** We have gone a long way, have we not?

**Mr Kendall:** It tells you the nature of how policy leaves farmers confused and baffled. The challenge about your gentle farming that you referred to is that I think there has been too much emphasis that we could have gentle farming here and put the onus on other parts of the world. I think both skilled farmers and natural resources and the benign maritime climate mean that we have a very important role to play in global food production going forward and to say that we are going to have a population of 70 million and we will use our wealth to buy it in so that we have a gentle system is a very questionable morality.

**Q320 Chairman:** Can I just ask one question? In paragraph nine, Peter, of your evidence,<sup>1</sup> you comment on price volatility and we have been talking about the important role of the price mechanism. Here you talk about volatility in respect of inputs and outputs and you say, “Volatility results from a very tight situation in respect of global demand and the difficulty in matching production

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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cycles around the world". If you are trying to say to farmers, "In the long-term you have got to make investments" which will have the potential of achieving the kinds of things we have just been talking about, do you have some kind of prescription to take away the volatility which has been a feature of agricultural markets for as long as there have been agricultural markets?

**Mr Kendall:** Yes, we do and it is something we have been promoting quite strongly throughout the food chain and it is designated long-term relationships in the supply chain. It is building relationships with retailers, where you sit down, you plan, you look across the production and you look at investment hand in hand with your own market. There are some really good examples. There is the example of Sainsbury's now doing it with Camgrain, my local cooperative in East Anglia, where they have replaced Canadian imported wheat and they worked together to work out the cost of production. There is the example of what Tesco are doing currently in the dairy supply chain and as well as Tesco giving six month guaranteed prices to farmers and then reflecting on the cost of production as they fix the next one, they are also putting money into research and development at their research station up on the Wirral. So it is a really proactive relationship with managing the long-term relationship. We see it in the malting barley industry, where people actually say, "I want to be a long-term supplier." The challenge, where I think it falls down, is that I cannot fix my fertilizer prices for more than six months or a year in advance. That makes some of that planning difficult. Most of the futures markets on the Chicago Board of Trade run to about two and a half years as their full limit, so the ability for me to hedge and reduce risk is limited by those forward markets, but also they do not exist in the import markets. I have been trying to buy diesel for the next harvest at 36p a litre for red diesel. At the moment I am having a job finding anyone who will pencil it in. I want to take some of that risk out for the next harvest.

**Professor Buckwell:** Just to add a different kind of point to support those arguments. One is economic diversification. Most farmers in Europe and even most farmers in Britain have more than one stream of revenue or income to their business because they have to, because the scale and the agricultural rewards are not big enough. That is an important part of the stabilisation policy, enabling that to happen, allowing farmers and their families to have a variety of income streams so that they do not all go down at once. That is one risk management strategy. The other is that environmental payments, whether they are coming from the environmental markets, from other businesses or from the public sector, looking after the environment is likely to be a long-term business, a ten year contract, that sort of thing. That is the sort of pattern that is striking. Again, that can be an important part of farmer income streams, adding some modicum of stability to the revenue flow of these businesses, who are primarily food producers but also delivering these other services. It is part of the diversification.

**Q321 Chairman:** One very important input is the human input to agriculture, both in quantity of labour and skills base. You have painted a picture, particularly on the skills side, of many challenging demands. You have indicated that farming will have to become an even more precision and high-tech operation than it is at the moment if the kind of productivity gains we have just discussed are to be realised. Are we properly equipping ourselves to make certain that agriculture has got the people, both in terms of qualifications and the quantity of them, to meet the challenges of the future?

**Mr Kendall:** I was rather hoping that some of the young lads leaving school today might favour agriculture over the City of London as a career path! If you look at the exciting opportunities of the future, I think that would be a wise move and we are seeing, actually, with the agenda that is being driven, I think over the last two years, maybe three, that admissions at agricultural colleges are starting to reverse and go up. That is really encouraging and at meetings Henry and I have around the country there is a growing number of young people who are really excited by this industry. I think it needs again a steer from government. We try, both of our organisations, to give a very positive image and championing of the role of farmers, managers, and also people coming in who want to be advisers to agriculture and people who want to be science technicians and developers within the agriculture sector. To be really quite candid, for too long farming has been seen as a problem rather than it actually being important and we have talked down the role of the industry. We have actually said to farmers, "You are not going to make much money. You will hold your trousers up with a piece of twine and you will have a pretty miserable time!" Now we need to make sure that people think this is a career which has a future and that it is going to be one which is rewarded properly by society and that you will not be considered to be somebody who just hangs on for subsidies. Being candid, sometimes we have got our message wrong. We actually ran for 20 years putting a downbeat message to people coming in that life is hard and tough and not very rewarding. So we need ourselves to be more positive about the future of the industry.

**Mr Aubrey-Fletcher:** Can I just make a point on the skills side? Peter is quite right when he talked about the opportunities for arable farming to get smarter and more efficient. The livestock sector is more challenging in some ways, although there are ways of improving beef production, et cetera. But the livestock sector has a crucial role, especially in the uplands of grazing the uplands and looking after them. The public has a huge affinity with the uplands and it is a real worry whether what we are talking about now—which is improved technology and being smarter, which we can do in the arable sector—how we are going to do that in the uplands. In the uplands they very much depend for their income, as Allan says, on holiday cottages, a lot of them work part-time, go and do something in the morning, feed the cattle, do something during the day and feed the cattle in the evening. They are living really on the edge at the moment, you know this very

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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well, and it is very important if we are going to go down this route of being smarter in food production in order to feed everybody that we take the livestock sector, especially the uplands sector, along with it.

**Mr Kendall:** There is technology being developed in South Africa at the moment where they are putting a bleeper in a cow and it will ring your mobile phone when the cow's temperature changes if it is either ready for mating and/or it has got a health problem, which is fantastic technology. It allows people to look after more cattle, particularly in isolated areas. So your phone rings and you know that cow number so-and-so is ready for a treatment.

**Q322 Chairman:** I think the problem is when the cows start ringing each other and when they get through to the bull, watch out!

**Mr Kendall:** I am sure there will be teething problems, but I think it is exciting technology that you can apply all over the place.

**Mr Aubrey-Fletcher:** It used to be a cow bell in Switzerland!

**Chairman:** Absolutely! David, you have a quick supplementary?

**Q323 David Lepper:** Peter was talking about the opportunities in farming and has been very upbeat about that. Some of us last week had an opportunity here to meet some apprentices in a whole range of what I think are called land-based industries, including farming. But one of the issues that some of the people involved in organising their training raised were some uncertainties about changes in the funding in further education which are not yet firmly put in place and are worried that that might affect planning for the future, planning which would enable that more positive picture which you have been giving to be broadcast a bit more. Is that something that your two organisations have drawn to their attention or have been bringing it to the attention of Government? We are talking about not Defra here but the two education departments.

**Mr Kendall:** If I could give you some further information in a written format on that, the actual details. We are concerned about the fluctuation, and again the concern I would have is that some of the restructuring of our education has almost meant withdrawing funds for certain centres and leaving rural agricultural colleges short of funds, but as regards actual numbers and details I would rather submit that, if we could, at a later date.

**Q324 Chairman:** That would be very good. One of the things again, Peter, from your evidence was this amazing chart which shows changes in productivity in different countries. I think I could pick out our UK line and what I see is a large number of countries which appear to be above us. If we look at the relative position between certain EU states and the United States, they are ahead of us and you have just painted a picture of high technology farming in this country. If we are that good, why are we so far behind other people in productivity increases?

**Mr Kendall:** I was, I think, trying to share a vision of what we can do if we move this industry from being—the history is, unfortunately, rather sad and tragic for many farmers with BSE, the Foot and Mouth outbreaks, and we can go back to salmonella if you want to go back further where farming in this country has been seen to be an environmental negative and its production has caused real problems to society. I think that has caused a lack of confidence, a lack of investment and we have seen a massive withdrawal from Government on the whole R&D agenda. That is not saying there are not inventive people who are driving and looking at what is going on around the rest of Europe and the rest of the world and trying those techniques. The challenge is, I think, to incentivise the industry to make sure we are as good as or better. If I go back to the period after the Second World War, I was not farming then but my history tells me that the Silsoe soya cells base was a world leader in developing soil technology. We had in the 1970s 17 research stations. Today we have three. We were selling them off two years ago, research farms, at a time when all the alarm bells were ringing around the world as regards production. I think we need to find a way of helping and giving the tools to farmers to make those lines converge.

**Q325 Chairman:** Do you think the attitude of farmers in this country is sufficiently “hungry” for success? The reason I ask that is when, some years ago, we had the pleasure of going to New Zealand to talk to farmers there about farming in effectively a subsidy-free environment, you either sank or swam by your determination and entrepreneurialship and there were some quite remarkable examples of young farmers starting out driving trucks, gaining a little capital, becoming a share farmer, then having their own holding, then going back to share farming to get more capital because they wanted to be bigger, better and really successful. The sample we met was small but the intensity of ambition was large and I just wondered if you felt that we had got the right mental attitude now, particularly for our younger farmers, to take forward the kind of agenda you have just sketched in?

**Mr Aubrey-Fletcher:** The opposite farming country is a very good place to see them and there are now extraordinary young people, the ones you get to see. The difficulty is that those who make it are terrific and are marvellous examples, but those who are frustrated for whatever reason, they cannot raise the money or they cannot get the farm, or there is some problem, they have still got their ambition but they might take it outside the industry and what we have got to try and do is to make sure that for those who really do want to do it and have got the ambition, the drive, the energy, intelligence, education and all the rest of it, we keep them in the industry and that is a challenge, I agree, but that is something we have to do.

**Mr Kendall:** I think the subsidy system does have a role and has played a role in allowing people who are not necessarily as ambitious and/or as driven to maintain a subsistence out of farming. That is a

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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consequence of the farming system but one in which we will need to be very careful of moving faster and in a different direction here in England. We already have a very different system in England than we do in Wales and Scotland and the rest of Europe and I do think the nature of support sometimes means that farmers can sit back and use the support rather than having to get their whole return from the marketplace. Some of the volatility we have seen has been as a result of what is happening around in the different support systems around the world and having less stock. So we are slowly moving away to a much more market-focused de-coupled system throughout Europe and I think there will be some benefits which come from that. We as an organisation try to engage in the way Henry talked about. We have a young generation dairy board now who bring issues about how they want succession to work and how that sector drives the under-35s, and that is an initiative we have started in the last few months.

**Q326 Paddy Tipping:** I was interested in what you said and where you come from and the evidence the CLA have put in, which is the importance of direct payments and you make the comment in your evidence that if direct payments went, a lot of the agriculture in Europe would go. Now, you have been a long time advocate of CAP reform and the phasing out of direct payments, but you are here arguing today for increased production and food security. How do you square that?

**Professor Buckwell:** It is difficult. You are absolutely right, it is difficult. The current European agriculture, as it stands, is in deep difficulty. It is highly dependent upon the public subsidies and it is massively criticised for its environmental delivery. Those are the facts and we will pick over the particular environmental criticisms and want to sharpen them up, and we think they are often overdone, but there is a problem there, i.e. there is a very real question about the current sustainability of European agriculture. Take away the support, as Defra and the Treasury blindly say, and everything will be fine. Do you know the average total income from farming per full-time equivalent in real 2008 pounds, Defra numbers, in the last 11 years? For ten of those 11 years the average total income from farming per full-time equivalent has been less than £500. Less than £500. With the subsidies it is a grotesque £12,500. That is what these people are living on—except they are not, they are having to supplement it by other income streams, and of course it is not the average. There is a tremendous distribution around it. That is the reality of where we are. Therefore, before we whip away all of that public subvention, which is the Government's current policy written out in 2005 and oft repeated since, we are simply saying that, number one, you cannot and you will not because you will not get agreement of the rest of Europe. Number two, it is not an intelligent thing to do anyway until you have agreed how you are going to pay for the environmental services you want when you have got this more market-oriented agriculture. This is a

process which will take probably two financial perspectives to achieve, i.e. about 15 or so years, and the sooner we get engaged on whether this is a one horse race where we are simply taking away all the props or a two horse race where we are redesigning the public support so that it delivers what the public wants from its land managers. It wants food, which we have been talking about in most of this evidence session, but it wants environmental services as well and that is quite a complicated thing, environmental services, but let us set about agreeing the quantum of them and the prices you will have to pay. One last point: if food scarcity is the future, and people seem to be agreed that it is, and therefore higher agricultural prices, that will stimulate the intensity I have talked about, which has a threat to the environment, and the cost of delivering that environment is rising in that situation. So it is not just that you have to pay for it, you are going to have to pay more for these environmental services in the future because they are going to be more scarce and the opportunity costs of delivering them are going to be higher. We are simply saying that is likely to demand a European budget of some size and spending half a per cent of European GDP for that kind of balance of food security and environmental security does not sound to us completely stupid.

**Q327 Paddy Tipping:** This is a tough area. I think there are governments across Europe who are going to say, "We want more food. It requires more subsidy." The pattern of argument is to move away from subsidies on production to wider public goods or more sustainability issues. How are we going to achieve those? Over what kind of timeframe?

**Professor Buckwell:** It is not as though we are starting from a zero base. Nobody can say the UK has not taken this challenge seriously and our farmers have reacted. They are offered an entry level stewardship scheme, which we supported, and we are getting close to the Government targets, providing they do not mess it up over set-aside, but that is another issue. So we are not starting from zero. I think we are learning how to devise these schemes. The critical things are how to make them non-bureaucratic for the administration and for the farmer and how to deliver some real environment, and what is it all going to cost? This is not a simple matter and that is why we will do it in stages, but it means a re-targeting of the supports, more of the supports post-2013. Other Member States have got to catch us up. I think the UK, along with Austria, is in the lead in engaging in this. We do not want to get too far ahead of the game because we are trying to compete with them.

**Q328 Paddy Tipping:** Presumably you are arguing for a big agricultural spending pot, but not one that is eroded as you move towards public goods but is there to achieve more sustainable long-term ends?

**Professor Buckwell:** Yes. The budget from which this comes is called the Protection and Management of Natural Resources, budget heading two of the European budget, and we are saying yes, we will need that sort of resource for this sort of policy.

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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**Mr Kendall:** We would have a slightly different take on this area on the evolution of the CAP. We do see that the world is going to be a place where food is going to be more sought after and therefore there should be a time where incomes are helped and I think, if you look at the figures, that actually if you see the subsidy as a percentage of total income of farming it is 15 to 20 per cent and not quite the whole amount of the profit. So we can analyse it in different ways. My concern is that what we will need to see is an unravelling of support globally before we start to say that agriculture needs less spending and what I would be nervous about is moving that spend towards the environment here in Europe while we have counter-cyclical payments, for example, in the United States, which is about maintaining agricultural production. I want and I need my support on my farm because I operate in both globally and EU distorted markets. I have different standards, both welfare and environmentally. While the WTO fails to recognise modern trade issues and I can have my market distorted by different welfare and different environmental schemes, I need some sort of protection. Do not wrap it all in the environment because actually you want to keep me producing food. So we have a slight distance, a debate we have openly, between ourselves about this role. I want to keep the production element in hand and where we have a decoupled payment what it enables me to do is to stand back from the marketplace when things are not right and the market seems rather strong, it does not mean I let the land all go to rack and ruin and get rid of my machinery. I can stand back, I can probably crop the best half of my farm in those difficult years and when the price signals get better I have got the resources in place to go and farm the whole of the land. That to me is critical in food security. It will keep the productive capacity in place and make sure we are not driven out or have costs placed on us to produce environmental records. That is the challenge.

**Q329 Dr Strang:** The farmer has to get his income either from the Government subsidies or from the market prices, but if the name of the game there is to increase production, surely we would never have gone down this decoupling road? Surely in terms of actually encouraging production you would subsidise the production and have production grants? I can understand why decoupling is attractive to the farmers, obviously, but in terms of the actual buyers, the taxpayer, if you want to increase production of a certain commodity then presumably you subsidise it? The other point I just ask is from what you said I take it that some of the other countries like France have not gone very far down this decoupling road, or is that unfair?

**Mr Kendall:** No, they have, and they are moving further all the time down the decoupling route. My concern with the ministers of the European Commission managing the market is that they have not got it right in the past and what we do need is for price signals to come through. The very beauty of decoupling is that you do not carry on producing

regardless, you do not end up with food mountains, you do not end up with a product that is not wanted for the right markets. Decoupling means that you have the ability, because of the reasons I have mentioned about distortions globally and internally, to be able to compete, to be able to produce, but it stops us having false production. If I have to plant an acre of wheat to get my support, it means I carry on doing it regardless of what the market signal is. So we are, I think, collectively committed to decoupling. We do not think there is a route—and the French always say, “We want to get involved in the market. Make sure you plant every acre regardless of what the market signals are.” If you have two bumper harvests, the best thing we do is not park some of the more marginal land for a couple of years until the market balances itself.

**Professor Buckwell:** Is not the point here, in what is food security for the longer term, that it is retaining the capacity to grow the food at all times into the future when there is a demand for it? Peter is quite right, you may well find this year, because a lot of stuff did not get planted last autumn, that people will look at the cost of the fertilizer and the rest of it and then will decide, “We won’t plant in the spring. We are not going to make any money out of it. We’ll plough it up and fallow it and we’ll have a better crop next time.” That is good from the farmer’s point of view in some ways, but it is not actually producing the crop so the food has got to come from somewhere. So when things go wrong there needs to be something underneath to ensure that that land can continue to be farmed into the future. It is not an insurance policy, but it is a way of ensuring that both the environment and the capacity to produce food are ensured on a continuing basis. I do not see that as a subsidy for production. That is protection of the capacity to produce food and to protect the environment and that is what I think the money is needed for going forward.

**Q330 Chairman:** What is the NFU’s definition of food security?

**Mr Kendall:** We feel very strongly it is about keeping the capacity and giving the right tools for us to meet our potential. It is not about setting targets for what we should produce, it is about having the tools and the instruments that allow us to meet our potential going forward and that is where I think it has been ignored for too long. It is an urgent matter and it is something which needs to be addressed again. I think there are some good analogies. I think people were pointing a finger at some of the practices in the City. It had to hit the wall before we made whatever regulation is going to be put in place. I think the issue of food security is looming large and I hope Defra takes it seriously and I hope you can prod them in that direction.

**Q331 David Lepper:** We have touched on issues about the food supply chain already this afternoon and, Peter, you gave us some examples of where it works well, where people have been able to get

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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together, and I think your evidence quotes from the CLA. You have suggested that UK farmers often are not all that willing to get together to ensure a strong producer controlled business stream. Could you comment a bit more on that?

**Mr Aubrey-Fletcher:** Interestingly, this morning we met up with the English Food & Farming Partnership, which was put together to try and encourage greater cooperation between farmers, but maybe, Allan, you would like to comment on that because I know you have some views there?

**Professor Buckwell:** Yes. The UK is known around Europe. We do less cooperation than some other more successful countries—and actually, funnily enough, those with the highest rates of productivity growth, and I think there is another signal there!

**Q332 David Lepper:** So there are higher rates of cooperation between them?

**Professor Buckwell:** Exactly, because then you have got more professional management and better investment advice, and so on, and the ability to get the technologies out in the field. We are trying. I think the EFPF<sup>2</sup> is a success story. It was set up following the Currie Commission. It sought to create both better horizontal integration and better vertical integration too, but this is something we have to keep working at. So we are simply saying we can always do better on this front.

**Mr Hind:** I do not think it is necessarily true that we are the sick man in Europe when it comes to cooperation. We may not get the level of vertical cooperation that exists in some supply chains and we may not have the same stability in terms of trading relationships, but when you look at some sectors in respect of the level of horizontal cooperation either through farmer-controlled businesses or through other kinds of operational systems I think actually it does well. The dairy industry is a good example actually where you do have quite a high level of participation either in direct selling groups or in cooperatives. The question is whether they are actually efficient businesses, or well-run businesses or not, and that, I think, is the big debate rather than just the business structure. Also, when you actually look at the farming system, the fact that we have quite a flexible land tenure system, the fact that we have quite flexible legislation in terms of agricultural holdings means that farmers have created a diversity of businesses which in a sense has created some level collaboration at a farming level which may not exist in other EU Member States. When you actually look around the European Union, we are very good at taking these great examples of Danske Slagterier in Denmark for all the foods, or Friesland Coberco, but they are very few and far between of the really good examples of farmer controlled businesses in the European Union. Yes, they are great examples. Yes, we should aspire towards them, but I think it is wrong to suggest that we are in the bottom league because if you look at some other EU Member States they are even further behind than us.

**Q333 David Lepper:** The two organisations I think do have a particular view on the Competition Commission's recommendations about a supermarket ombudsman. Could you just tell us briefly what your views are?

**Mr Kendall:** We feel very strongly about the need for strengthening the code and an ombudsman to make sure that code is adhered to, a strengthened and widened code to more retailers. It is absolutely fundamental, we think, for Defra to get behind this and see it through. I am conscious at this moment in time that retailers are lobbying very hard to BERR to say that we should have it, pointing towards the cost of regulation on consumers at this moment in time, but the work we have been doing with Professor Roger Clarke of the Cardiff Business School shows that the cost of the ombudsman would be, in his estimation, 0.0051 per cent and I feel very strongly that the retailers should not be making a fuss about that. The Competition Commission has also pointed out that actually a strengthened code and an ombudsman would be good for consumers because it would provide long-term security and that we would not have very heavy-handed and promiscuous retailers scouring for a cheaper product at every opportunity. So we think there is a big role for Defra here to get behind and champion its sector in having the sort of instrument which allows long-term thinking. I got into trouble with Tesco for making the analogy in a speech at Christmas where I mentioned the short-term reputation we have in the City of London where they want to look at short-term dividends and not long-term issues about the investments we need in agriculture.

**Professor Buckwell:** We are at one on that and that is an international problem. It is the case everywhere that the retail sector and the food processing is highly concentrated and farmers are highly fragmented, so the terms of competition are uneven, unbalanced, and therefore you have got to find mechanisms so that those who—obviously we want to do business with supermarkets, they are our main outlets and they are absolutely critical to what we are doing, so we have to be careful in the way we address them, but the fact is there is uneven market power there and I am afraid where there is market power it will be used. So we do need these mechanisms.

**Q334 Chairman:** There is ever so slight an inconsistency in that line between what you were saying earlier about the supply chain relationships because the antidote to the need to employ an ombudsman should be that in an ideal world all agricultural supplies were subject to the type of close working where if you have open book agreements everybody should recognise that each side has got to make a return and some of the angst to the kind of trader mentality which has caused the whole debate about the relative power structure to come into being would, if you like, in an ideal world be taken out?

**Mr Kendall:** What we have seen—and I remember having discussions with senior retailers about food security two and a half years ago and they did not think it was an issue. They said energy security was,

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<sup>2</sup> English, Farming and Food Partnerships

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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and I have seen your evidence given from one of those saying that it was an issue. Now, what I have seen in, for example, dairying is that we have lost a billion litres of capacity over the last three years. They see a massive decline in the UK output in dairying and therefore they have put a supply chain relationship in place which protects their output. What I am saying is that they need to do that more imaginatively in other areas. At the moment, for example I think in horticulture we see year on year declines in our total output of horticultural produce. We move around southern Europe. We go to Morocco, Spain, Portugal. We mine water and we move on to somewhere else. A long-term supply relationship, I think, in the horticultural sector in the UK where for a small amount of extra money you have some certainty and investment would be a much better way of doing business.

**Q335 Chairman:** Let me move back to an area. We have touched on the subject of the reform of the Common Agricultural Policy and the role it performs, but I think with the CLA you have touched on the famous 2005 vision document and I think you said earlier in your evidence that Defra or the Government was still weighed down by the position and Defra was inhibited. Let us just focus for a second on Defra because one might argue, given the view you have put forward about the use of the public's money to underpin a truly vital industry, that Defra should be now shouting from the rafters in government, "Throw 2005 away and recognise that there is a role for the public's money," in the way you described, but I do not hear much shouting and it does raise the question as to whether you truly believe that Defra can punch its weight in government if it believed in its heart of hearts that something along the lines of the use of the public's money that you have described was a good and proper policy objective.

**Mr Kendall:** I got into trouble for despatching that report into a bin at the Royal Show last year!

**Mr Aubrey-Fletcher:** I think we have got to remember where Defra has come from. Earlier on, when Defra was first formed, most of the people had an interest, involvement or understanding about food production that did not transfer across. The environmental people there were very focused on the environment and the Government at the time did not see food security as an issue and that actually we have got to do something about the environment and farmers were the problem, et cetera, et cetera. When David Miliband was Secretary of State he spoke at the CLA's centenary conference just a year before Peter and he said, in his own words, that food security was not an issue in its simplest sense of having enough food to eat in this country. Last year, 2008, Hilary Benn, who had just taken over from David Miliband, said in his speech nothing about food security, it was all about putting more controls over what farmers did. Most of this was, we think, presumably from the civil servants at Defra and ministers who actually probably read what was being said. Within the space of a year it translated completely across to this year's Oxford Farming

Conference where Hilary Benn made a speech which was very much about food security. A lot of that was due to hard work by all of us in trying to get this point across. Now, where do we go from here? Does Defra in the form of its elected ministers and Secretary of State carry the food security and environmental agenda going forward, dragging the Defra officials with it, or do the Defra officials have to enter into a world where they now do have to recognise that food security is an issue? It is very interesting. There was a World Climate Change<sup>3</sup> forum two day gathering on what we were going to do about methane and nitrous oxide and reducing those as far as we could without destroying the industry and there was a much better feeling, I felt, amongst the Defra officials there about almost a resignation that, "This is an issue. We can't destroy our food production industry by reducing nitrous oxide and methane to the extent that we merely export it," and the same applies when it comes to food security and environmental security, that actually now we have got to work together and we have got to find a way forward to ensure that British agriculture continues to play its part and more in the future –

**Q336 Chairman:** I think your analysis of "We have to work together" is a perfectly respectable line, but the point I was making, which came out of 2005, is that the battle is not without, it is within government and that is the point. You can respond to that.

**Mr Hind:** It actually goes further than the issues within government, it actually goes into the European Union itself and my experience of working in Brussels is that the UK finds itself time and again marginalised on issues about the Common Agricultural Policy, which still represents the best part of 40 per cent of the European Union budget because it takes such an extreme position on the CAP and even though it might engage itself in constructive debates about specific aspects of agricultural policy, every Member State knows around that table that for the reference point the Government's policy is a 20:20 vision that says, "We want to scrap the CAP." Secondly, if you look at that more widely, given that agriculture is still such a politically and philosophically important part of the European Union and of how other Member States interact with the European Union, the longer we go on with an extreme policy in relation to the CAP the more marginal we become as a player in the wider European Union debates. I know that the Government has got great aspirations, to want to show leadership to the European Union, but in my view until it takes a much more sensible approach on agricultural policy it will not do that.

**Q337 Chairman:** But the question then is, how does Defra, if it agreed with that synopsis, bring along those other parts—and we are all thinking of the Treasury at the end of the day—to meet the objectives you have just enunciated?

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<sup>3</sup> *Witness amendment:* Rural Climate Change forum

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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**Professor Buckwell:** Our answer would be that a civil society has to demonstrate that it cares sufficiently about food, the environment and security that it is willing to vote the appropriate resources to bringing those goals about. We do not minimise the challenge. You are absolutely right, this is a straightforward Defra/Treasury battle and we know the British rebate is sitting there in the background and in a sense the price for giving up some of that in the next perspective is that the cost of Europe has to come down, which means the CAP, and we know that the fiscal environment in which this battle is going to take place in two or three years is going to be horrific. So none of us is under any illusion that any of this is simple, but we are still making the observation that European citizens want to be fed, European citizens want a better environment, and that does not come cheap and for free. The people who deliver it have got to earn a living.

**Mr Kendall:** I go back to my very early point about public service agreement for production, somebody who actually looks at the productive capacity of UK agriculture. At the moment the only target Defra has is one that drives regulation. It is about preserving and protecting its natural resources.

**Chairman:** I am conscious that in October Defra is going to have to say something on this when it responds to its consultation document. It will be very interesting to see whether it has managed to move the agenda forward by the sort of quantum leap you have indicated it will have to. Anyway, we will let that question hang in the air and move on to Gavin.

**Q338 Dr Strang:** You referred to the cutbacks in publicly funded research and development in agriculture in the eighties and the nineties. The question I would like to ask you is, what is the view of the two organisations in relation to public funded research and development in terms of the quantity, the quality and in terms of how it might be improved?

**Mr Kendall:** I think Tom might want to say something about the work we need to do in analysing some of the shortcomings on that. What I think we also have to be realistic about is that we are facing a financial crisis the like of which none of us has ever seen before, so looking and always turning to Government for solutions is going to be challenging and I think that brings knowledge that asking for more money is difficult. However, when we look at the spend between 1988 and 1998, public spending on R&D fell 45 per cent for agriculture. The idea was that it was going to be picked up by the private sector and a combination of private sector and public sector R&D in agriculture from 2002 to 2006 fell a further 40 per cent on top of the 45 per cent drop, so obviously the private/public sector combination did not step up to the plate. I think the challenge is that some of Defra's spend has been very much about analysing environmental protection and environmental testing and we need more of a realignment and the balancing goes back to that PSA, if you like, a balance between production and environment hand in hand rather than just saying, "It's about protecting the environment," the whole

time. It is about producing more and impacting less. One of the things I have been pushing for, and it is an exploration we need to have, is how we incentivise—and I am very optimistic that we will have a more profitable and competitive sector going forward—how do we encourage the industry to make long-term investments in R&D? I think we have to look at smarter tax breaks for businesses that they can roll over money, because this is not a quick pay-back in the way the City of London has had venture capital stimulation. At the moment there are good tax write-offs for corporations who invest in R&D, but they do not apply to individuals. We have got to find a way whereby we encourage people, so that if someone has a very good year because of the fluctuations of farming, how can you write off and get the 175 per cent tax break you currently get if you are a corporation, as an individual? This is a long-term planning job and I do fear—and we have great hope for the new Agricultural and Horticultural Development Boards coming together and having a single research and development director who will make sure that there is not overlap, that there is a real focus to make sure that the industry re-plans its R&D and gets more bangs for its bucks collectively, but because of the nature of the AHDB<sup>4</sup> (it is a body which now has a sunset clause, that if it does not do what farmers want they can call for it to be wound up) they do not have the ability to think very long-term. These issues are a 20 year timeframe, often, research and development. There must be a big increased role for Government if we are realistic about the challenges. We are in the process, and we are in the process, of trying to analyse where the shortcomings are, the areas we need to address and the sort of money we believe would be required. Even for us that is quite a challenge, to identify the amounts and the real shortfalls.

**Mr Aubrey-Fletcher:** Also, I do not think we should do this in isolation. Some of the technological developments we need to do, especially if we are going to get into GMs, et cetera. It will have to be done on a global scale and it is not just us that has got this problem, it is all over the world and we need to galvanise the European companies and farmers in other parts of the world to develop some of these ideas, to take them forward. You are quite right, it cannot all fall on the public sector, it has got to be shared.

**Q339 Dr Strang:** In my definition some of the long-term research has to be done by the Government, does it not? No one else is going to do it. You mentioned Silsoe earlier but you could not visit anything other than a publicly owned research establishment really doing research on that?

**Mr Kendall:** I think one of the weaknesses on the GM debate is that it has been all handed over to very large multinationals. If the Government is having a role in this there might be less cynicism and less ability to say this is all about the private sector chasing short-term greed at the expense of the wider environment and I think there is a role, that

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<sup>4</sup> Agriculture and Horticulture Development Board



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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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Government needs to get involved. The example I frequently use is of you using wild potato genes to put into modern varieties to protect against blight, avoiding the spraying that we had in 2007 when farmers were having to spray for blight every five or six days, some people had to spray 20 times, and we have the ability to do the research. I think Government needs to get behind it so that the public can see and the retailers can see that this is Government approved science and technology and not just a private sector company banging the drum for its short-term gain. That is an important role for Government.

**Q340 Chairman:** One thing you did not say, which slightly surprised me, unless I have missed it, is about what I would call practical application research as opposed to blue skies. At one time that was synonymous with ADAS, but ADAS is no longer and many people have said that what is really needed is more practical science about applying new knowledge at the level of the farm. Are we deficient in that?

**Mr Hind:** I made a point earlier about when it comes to the decline in productivity parts of that may be because of the decline of the publicly funded extension service in the United Kingdom. I am not saying that was necessarily the wrong thing to do, but ADAS, of course, fulfilled that function in the same way that Teagasc provides it in the Republic of Ireland, the same way that the Institut de l'Élevage does it for the livestock sector in France. I think there is a very big issue about how you translate the blue skies science, as you quite aptly described it, into practical application and resource for farmers. To an extent the levy bodies have been fulfilling that function within their individual sectors and I think AHDB as it comes into being, as Peter says, provides probably the conduit from which you can take the science that is done by Rothamsted or by IGER<sup>5</sup>, or by somebody else, and then translate that and change that into some kind of practical form which can then be delivered through extension groups, through farm business consultants, and so on, on to farmers. That for me would be the vehicle for building the delivery.

**Q341 Chairman:** Whilst we are still on the scientific theme, let us move briefly to something you have touched on in your remarks, which is the question of GM technology. I think the first observation I make is that I was interested that you thought you could make still quite significant increases, certainly from the arable sector's point of view in productivity without the use of that technology. On the other hand, that technology does exist. The European Union's processes, certainly as far as bringing genetically modified substances into the European Union, have made progress in that area very difficult. The trials in the United Kingdom context have made it almost impossible to evaluate the technology and it is a debate with I recognise does

cause a lot of angst because there are some people who passionately disagree with the technology, and the reverse is true. I suppose my first point is, does Europe need to change its attitude towards this technology and its approvals process towards its application? Secondly, is it something that we should still spend time debating or can we get on doing all the other things and just park it?

**Mr Kendall:** One of my roles is also Vice-Chairman of COPA<sup>6</sup>, which is the European farmers' organisation, and when you get the Italians involved and Greeks we are never going anywhere on a unified approach on GM. However, I think the European Commission is realising its approvals process at the moment is imposing a massive risk on its livestock sector and the speed of approvals has massive implications for the cost of GM-free and/or trying to identify unlicensed products in its presence in GM-free carcass and this is putting the cost up for the livestock sector massively. So we do need to have, I think, a strong lead from the EU about licensing, about being in sync with the United States and South America, otherwise this is going to be a massive disadvantage and we will find ourselves importing a livestock product which has been fed on GM and we cannot use it here in Europe. That is the first point. What I always say is that whatever our views on GM it is really critical that consumers want to buy it. I look at the challenges we have outlined going forward about doubling food production in 40 years and when we started these discussions it was 45 years. It seems to be getting nearer and nearer the whole time and we keep saying we have got to massively ramp up production. I think we are going to need all the tools at our disposal and we need to have an open and sensible dialogue about that. We cannot make consumers consume a product with technologies they do not like, so that does need work done on labelling. It does need work to be done in parallel with other technologies. The point I made was very much that this needs to be Government involvement as well and not just private sector because of "Frankenstein" food messages that so much can be laid at the door of private sector companies.

**Mr Aubrey-Fletcher:** But the hearts and minds is the key. I always think of the MMR example where scare stories were run, a certain well-known one, as a result of which today there are children suffering—and many of them—getting measles and suffering from that, and measles can kill. It was misinformation and it was raised up in the press and we have got to try and reverse that and it is very hard to do. Unless we can do that, unless we can win the hearts and minds debate—and I suppose that does have to be done across Europe—then the rest of it we are not going to achieve. But there again that is something that Government can help with.

**Professor Buckwell:** It seems inconceivable that the world is going to achieve what plainly it has to do in the next few decades without employing all the fruits of biological science, and the greatest fruits have been the work of Darwin and the work of Watson

<sup>5</sup> Institute for Grassland and Environmental Research

<sup>6</sup> Committee of Professional Agricultural Organisations

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4 March 2009 Mr Henry Aubrey-Fletcher, Professor Allan Buckwell, Mr Peter Kendall and Mr Tom Hind

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and Crick in understanding the genomes of our major food plants and animals and not to exploit that knowledge is just so obviously not very smart, but we have got some mountains to climb in Europe to get over that. It may be that Europe simply lags behind the rest of the world for a long time, which puts us at a competitive disadvantage.

**Mr Kendall:** Particularly in the areas of trying to address climate change as well, and if we can find smart ways of reducing our dependence upon nitrogen fertilizers with all the nitrous oxide emissions, they are massive challenges. Drought, tolerance and the ability to withstand extreme temperatures and lack of moisture, these are absolutely vital areas and that is why I think we must be putting a constructive dialogue in and putting some funding into making sure Government is saying we need to look at all these available tools.

**Q342 David Lepper:** If the regulations about field trials in this country changed, do you have a sense that there are farmers around who would be willing to carry out field trials?

**Mr Kendall:** Both my Vice-President and Deputy President were involved in trials in the past but, for various reasons, obviously it was stopped. I think having to publish grid references of where they are does not encourage people to get involved in having a debate on this and you end up with Peter Melchett in a white suit on your farm! As pleasant as that might be, it is not to be advised.

**Q343 David Lepper:** But if the regulations changed, there would be people there willing to undertake the trials?

**Mr Kendall:** Yes.

**Chairman:** Gentlemen, thank you for a genuinely stimulating and interesting evidence session. Your written evidence was very much appreciated and your comments today I think have greatly added to our inquiry. Peter, you very kindly said that there were one or two points you wanted to come back to us on in writing and I would say, Henry, if there are any other things you wanted to amplify or even things we have not asked about that you feel compelled to let us have your views on, as always we would be delighted to hear from you. Thank you very much for your contribution to our inquiry.

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#### Supplementary memorandum submitted by the National Farmers' Union (SFS 14a)

##### FUNDING FOR AGRICULTURAL COURSES

When looking at the provision of training and skills development it is important to differentiate between short duration, providing the skills and training to meet industry's day-today needs, and that which is long term to provide industry with the skilled people needed for the future.

It is important that employers see a business benefit in the training and this will be provided by ensuring that funding follows the training and is not concentrated around the delivery of a qualification, "making people more employable", which has been the focus of Train to Gain (T2G). There is now some flexibility in this but the nature of the land-based sector, small and micro-businesses, means that providing training for small numbers of attendees has not proved financially viable. Larger employers have been able to avail themselves of funding because they have been able to provide the time to discuss their needs with a T2G adviser and can provide the numbers of trainees.

Generally there is doubt about the engagement by Defra with the Department for Children, Schools and Families (DCSF) and the Department for Innovation, Universities and Skills (DIUS) as regards representation of the concerns and unique situation within the land-based sector. It is open to question as to whether the DCSF and DIUS look to Defra as being the representative body on behalf of the land-based industries.

##### APPRENTICESHIPS

Apprenticeships can be seen as fitting into both categories in that they provide the learners with the skills needed to do the job and secure the future of the business. Unfortunately the uptake within the land-based sector is likely to be low because employers will not be able to fund the wages required. Under the Agricultural Wages Board (AWB) an employer will be required to pay an apprentice aged 16 to 18 the sum of £137.67 per week rising to £223.47 per week for those aged 22 and over. This does not include any other expenses, for example travel costs.

This is not just a problem for the land-based sector because it affects all sectors where there are small businesses. The argument is that the employer will be paying twice for the job, once for the "proper worker" and again for the apprentice who will need to be trained/supervised by the "proper worker", not to mention that the apprentice is likely to be away from the workplace for part of the time on training etc.

The Government say that there may be funding for the training but not for training that is required by statutory legislation. They further say that because the employer will benefit from the apprentice they should pay the wages.

PROVISION OF PLACES

Landex, the representative body for the land-based colleges, say that they teach more than 65,000 learners on further education and skills training courses and over 8,000 at higher education levels each year. They comment that there is an urgent need for Defra, through its links with DIUS and DCSF, to ensure that the transition of revenue funding arrangements under the Machinery of Government reforms from the LSC to funding through local authorities does not put at risk the funding of land-based provision. It is difficult to understand how a national policy of up-skilling the sector can be brought about as a result of regional and local as opposed to national commissioning.

Landex are also concerned that colleges are now facing the potentially disastrous consequences of the difficulties associated with funding the Buildings for Colleges programme. Action should be taken urgently to find ways of limiting the effects on the levels of land-based education and training provision. In the longer term, the criteria for determining the priorities for capital funding allocations must include appropriate recognition of the need to ensure adequate resources for the specialist provision required in the land-based sector. Difficulties with the capital funding could result in development programmes being put on hold or abandoned.

It is often necessary for residential accommodation to be provided for students and this places extra burdens on both the college and the student which could present a barrier to attendance.

*March 2009*

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## Wednesday 18 March 2009

Members present

Mr Michael Jack, in the Chair

Mr David Drew  
Mr James Gray  
Lynne Jones  
David Lepper  
Miss Anne McIntosh

Dan Rogerson  
Dr Gavin Strang  
David Taylor  
Paddy Tipping

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### Memorandum submitted by Natural England (SFS 63)

#### EXECUTIVE SUMMARY

Natural England believes:

- Food security and environmental security are both essential, they are often highly interdependent and should be addressed together, particularly given the challenge of climate change.
- Addressing the need for food security should be undertaken in a way which ensures natural resources are used sustainably and any negative impacts on the natural environment avoided or mitigated, both here and abroad. Protection of the terrestrial and marine environments will contribute to food security by maintaining the ecosystem services upon which we depend.
- The current problem of food insecurity is, globally, primarily one of unequal distribution and access to food, and, in the UK, of household food insecurity and of poor nutrition; rather than a lack of overall availability or insufficient production. Sustainable food production can contribute to food security by providing food of good nutritional value.
- In the long term, global food production is likely to need to increase. We should seek to avoid and mitigate the increase in global demand for food as far as possible through more sustainable consumption and diets and less waste in supply chains. These approaches could have significant health and environmental benefits.
- If, in future, food production in the UK and Europe needs to increase to provide people with healthy diets, there will need to be simultaneous improvements in environmental performance. In Europe, the Common Agricultural Policy should aim to ensure both our food and environmental security.
- Retaining the capacity to produce food in the UK and Europe is important for our food security, including through support for sustainable food production, appropriate research and development, protection of fertile land whilst allowing for other required land use changes, and suitable skills and knowledge.
- Resilience in the food system will be stronger with a range of supply chains, including but not exclusively with healthy domestic agricultural and fisheries sectors, and we should encourage those with the lowest environmental impact. International trade policies relating to food and agricultural products should include the aim of the protection of the natural environment.
- There is an important role for local enterprises, citizens, and communities in ensuring food and environmental security, such as through involvement in allotments and community orchards, and these activities have multiple health benefits. Sufficient land needs to be made available to local communities to enable them to participate in sustainable food production.

#### 1.0 INTRODUCTION

1.1 Natural England is a statutory body created in 2006 under the Natural Environment and Rural Communities Act. Natural England's purpose, as outlined in the Act, is to ensure that the natural environment is conserved, enhanced and managed for the benefit of present and future generations, thereby contributing to sustainable development.

1.2 We believe food security and environmental security are both essential, they are often highly interdependent and should be addressed together, particularly given the challenge of climate change. Achieving farming and fishing that ensures food security and the protection of the natural environment is a major challenge for the 21st Century.

2.0 *How robust is the current UK food system? What are its main strengths and weaknesses?*

2.1 In our view, the current problems of food insecurity in the UK are concentrated at the household level and relate to dietary patterns and nutritional security, rather than an absolute shortage of food or chronic problems with supply. For example, obesity in England has trebled in 20 years; nearly a quarter of adults and about 10 % of children are obese today.<sup>1</sup> We recognise the need for mechanisms and initiatives to encourage healthy eating and support those most vulnerable to food insecurity in the UK.

2.2 On a national level, we believe we are currently adequately food secure in terms of sufficient quantities of food available. In the long term, however, we cannot guarantee such a secure food supply given a number of underlying factors such as climate change, population growth, and the depletion of oil. We therefore need to develop strategies to ensure the UK's food security whilst protecting and enhancing our natural environment.

3.0 *How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

3.1 The United Nation's Food and Agriculture Organisation (FAO) estimates that global food production will need to double by 2050, to meet the demands of a rising world population.<sup>2</sup> 50% of this increase is accounted for by projected growth in population, with the other 50% due to different patterns of consumption. As the future is inherently uncertain, these projections are only of some value.

3.2 Notwithstanding these inherent uncertainties, we agree that in the long term global food production is likely to need to increase. In our view, as well as more sustainable food production, nations should seek to avoid and mitigate the increase in demand for food as far as possible, encouraging more sustainable consumption and less waste.

3.3 It is estimated that there are currently 850 million people in the world who are under nourished,<sup>3</sup> but there are also estimated to be over 1 billion people who are overweight.<sup>4</sup> Reducing the overconsumption of food could help to mitigate the increase in the global demand for food and reduce the burden of diet related disease and ill health.

3.4 There are also strong arguments for reducing our current consumption of energy intensive foods with relatively high environmental impacts. This may include eating less meat from cereal-fed animals and favouring meat from grass or by-product fed animals reared as part of mixed farming systems or in areas where other forms of food production are more difficult.

3.5 Reducing waste in supply chains and households would also help to mitigate the increase in the global demand for food. The UK food industry produces 6.5 million tonnes of waste a year<sup>5</sup> and around a third of all food is wasted at household level, half of which is edible.<sup>6</sup>

3.6 The largest increase in demand for food is likely to be in developing countries, where there are more opportunities for increasing food production. Increasing food production in the UK to address global food insecurity concerns is unlikely to make a significant contribution to addressing the problem. Currently, the UK only produces approximately 0.97% of the world's cereal output.<sup>7</sup>

3.7 If, in future, food production in the UK needs to increase to provide people with healthy diets, there will need to be simultaneous improvements in environmental performance. We believe that we must work together to reduce environmental impacts and avoid damage to the natural environment whenever seeking to increase food production.

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<sup>1</sup> Department of Health, *Foresight Tackling Obesities: Future Choice*, DH, 2007.

<sup>2</sup> FAO, *World Agriculture towards 2030/2050*, FAO, June 2006.

<sup>3</sup> FAO, *The State of Food Insecurity in the World*, FAO, 2006.

<sup>4</sup> World Health Organisation, *Chronic Disease Information sheet: Obesity*, WHO, 2003.

<sup>5</sup> Prime Minister's Strategy Unit, *Food: Analysis of the issues*, March 2008.

<sup>6</sup> Waste and Resources Action Plan, *Understanding Food Waste*, WRAP, 2007.

<sup>7</sup> FAO, 2004.

4.0 *Question 3: In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

- (a) *soil quality*
- (b) *water availability*
- (c) *the marine environment*
- (d) *the science base*
- (e) *the provision of training, etc.*

4.1 Protection of the terrestrial and marine environments will contribute to food security by maintaining the ecosystem services upon which we depend. Measures intended to address food security should also be undertaken in a way which ensures natural resources are used sustainably and negative impacts on the natural environment are avoided or mitigated.

#### *Soils*

4.2 Soils are essential to produce our food and, when managed well, can increase fertility and yields. Soils support our diverse landscapes and play a vital role in maintaining the balance of gasses in the air, as well as helping to clean water. Soils also have a role in storing and releasing carbon, with consequences for climate change.

4.3 Poorly managed soils can increase flood risk and incur economic costs. An estimated 13 million tons of carbon are lost annually from UK soils.<sup>8</sup> There are many opportunities for improving and restoring the quality of soils in England which would support agricultural productivity, environmental protection, and the natural environment.

#### *Water*

4.4 Water is vital for food production and our rivers, lakes, and wetlands are distinctive components of the English landscape. Over abstraction, drainage, and diffuse pollution from agriculture can all affect the quality of water and the water environment. Diffuse pollution from agriculture accounts for 60% of the nitrogen load in UK freshwater.<sup>9</sup> The sustainable use of water in agriculture is important, and will become increasingly so given the impacts of climate change.

#### *Marine environment*

4.5 Fishing and aquaculture are important industries and fish and seafood are important sources of nutrition. Globally, 16% of fish stocks are over exploited and 52% are fully exploited. In 2002, 50% of the UK catch (by value) came from stocks that were in borderline or unsustainable condition.<sup>10</sup> Protecting fish stocks and the marine environment will help to ensure our food security in the future.

#### *Science, knowledge and technology*

4.6 To ensure our food and environmental security, a strong science base is essential. In the UK and Europe, we need to facilitate research, development and extension of new farming practices, designs and technologies that can produce food with a lower impact on the environment.

4.7 In England there are opportunities to improve the productivity and environmental performance of conventional food production systems. These include improved husbandry techniques, better timing and accuracy of input applications, and the development of crop varieties and management systems.

4.8 There are also opportunities to develop our knowledge of smaller scale agricultural systems based upon ecological principles. Intercropping, agroforestry and undersowing can increase the output of food in a given area of land.<sup>11</sup>

#### *Training, education and skills*

4.9 Developing highly skilled, environmentally aware farmers, fishermen and food producers is important for food security. Mechanisms to enable the dissemination of knowledge and good practice are therefore important. We welcome initiatives in this area, such as Lantra's Diploma in Environment and Land-based Studies and the Fresh Start schemes.

<sup>8</sup> Bellamy J, *UK Losses of Soil Carbon: due to climate change?*, Cranfield University, 2007.

<sup>9</sup> Defra, *Observatory Programme Indicator for Nitrate and Phosphate levels in water*, Defra, 2007  
[https://statistics.defra.gov.uk/esg/ace/da3\\_data.htm](https://statistics.defra.gov.uk/esg/ace/da3_data.htm)

<sup>10</sup> Prime Ministers Strategy Unit, *Net Benefits*, stocks under quota, PMSU, 2004.

<sup>11</sup> Rämert B, Lennartsson M, and Davies G, *The use of mixed species cropping to manage pests and diseases—theory and practice*, 2002.

### *Land use*

4.10 To help retain a productive capacity for food, we need to protect the capacity for land to be used for agriculture and food production, whilst valuing the current environmental services it provides and allowing for necessary change, including for example the creation of habitats and coastal change.

4.11 As pressure on land for all uses grows, it will be necessary to take a strategic view on the multiple benefits to be provided by land and to consider how to integrate food and non-food production with landscape and biodiversity objectives, as well as strategies for responding to climate change. Account should be taken of the ease of reversibility and permanency of any changes in land use.

### *Resilience, energy and climate change*

4.12 A range of supply chains will strengthen resilience in the food system, as it enables greater flexibility and adaptability when responding to external shocks. As such, we should seek to maintain a mix of supply chains, whilst particularly encouraging those with the lowest environmental impact. We should also expect a diversity within the food processing, manufacturing, and retail sectors.

4.13 The reliance of agriculture and the food system on fossil fuels presents a major challenge to ensuring food security. It is estimated that 95% of all food production is “oil dependant” with the manufacture of nitrogen fertiliser the single largest indirect use of fossil fuels in agriculture.<sup>12</sup> Agriculture and associated food chains need to become less reliant on exhaustible energy resources.

4.14 Climate change is already adversely affecting food security in the world through droughts, flooding, and sea level rises. Agriculture is a significant contributor to greenhouse gas emissions: In the UK, GHGs from agriculture account for 7% of the UK’s emissions.<sup>13</sup> The whole food chain needs to reduce its emissions and adapt to climate change, particularly to water scarcity. Farmers and land managers have a key role to play as “carbon managers”.

### *Trade*

4.15 Trade at all levels can be beneficial to ensuring food security as it provides access to a wider range of foods and allows wider markets for our products. Trade liberalisation policies however have encouraged specialisation and the expansion of food production, resulting in some environmental problems. Conversely, some traditional production systems have become uncompetitive, leading to land abandonment and biodiversity loss.

4.16 These negative impacts of trade liberalisation can partly be mitigated in the UK and the EU through policy instruments. It is important, therefore, that trade policies encourage greater sustainability in food production and do not constrain the legitimate use of policy measures to protect and enhance the natural environment.

4.17 Elsewhere in the world similar measures, regulations and standards may not be in place or sufficiently adequate, leading to the possible “exporting” of environmental damage. International environmental food production standards, agreed and applied by all governments, are therefore now required.

### *Farming and domestic food production*

4.18 Farmers are custodians of some 18 million hectares of land in the UK, the greater part of which is managed to produce food.<sup>14</sup> In England, farming has made progress in becoming more environmentally responsible in recent years, with over 60% of English farmers signing up to agri-environment schemes. Some technical and economic drivers in farming, however, have encouraged activities which have resulted in, and continue to result in, avoidable environmental impacts.

4.19 In terms of food security, domestic food production is important as it provides some of the key components in a range of supply chains, thereby lowering risk and increasing resilience in the food system to shocks and disruptions. However, policy mechanisms (such as subsidies) designed to increase domestic production beyond that which can be supported by the market, have in the past lead to agricultural intensification production and negative consequences for the natural environment.

4.20 Public support should be given in return for public goods, such as environmental benefits. Supporting the wider adoption of farming and food systems with high environmental value and lower environmental impacts, for example, systems under Environmental Stewardship’s Higher Level Scheme, could help to retain a level of domestic production and productive capacity, whilst also delivering crucial environmental benefits.

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<sup>12</sup> Defra, *Sustainable Farming and Food Strategy—indicator data sheet*, Source: ADAS, 2006.

<sup>13</sup> Defra, <http://www.defra.gov.uk/farm/environment/climate-change/index.htm>

<sup>14</sup> *Strategy for Sustainable Farming and Food*, Defra, 2003.

### *Landscapes, habitats and biodiversity*

4.21 The landscapes of England are formed in large part through the interaction of food production over millennia with the natural attributes, not least geology and soils, of individual localities. They are part of our identity, culture and history and they provide a range of recreational and educational opportunities.

4.22 The increasing specialisation and intensification of agriculture, however, has been a factor in eroding those landscape features and qualities that had previously heightened the distinctiveness of different localities.<sup>15</sup> In 40% of National Character Areas, the past losses of landscape character either showed no sign of reversal or change is continuing to adversely transform character.<sup>16</sup>

4.23 As well as landscapes, the intensification of food production has also had an impact on habitats and biodiversity. For example, 97% of lowland unimproved grassland was lost between 1930 and 1984 in England and Wales, and the number of specialist bird species in the Farmland Birds index continues to decline.<sup>17</sup>

4.24 Biodiversity is often disrupted by, or is in competition with agricultural production. For example, if almost all the available (solar) energy is sequestered to a crop there is little left for biodiversity, unless it feeds on the crop.<sup>18</sup> But, it is possible for biodiversity to have an agronomic value by, for example, being part of an ecosystem that suppresses pest and disease populations to below yield damaging levels.

4.25 Improving the environmental performance of agriculture and increasing food production in England is potentially possible but will present challenges, particularly for protecting and enhancing England's wildlife and landscapes.

### *5.0 What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

5.1 As we described above, obesity in England has trebled in 20 years<sup>19</sup> and large increases in obesity are predicated in the years ahead, with 60% of people obese by 2050.<sup>20</sup> In the UK, if people followed World Health Organisation's guidelines for a healthy diet we would eat:

- 15% less meat and milk;
- 75% less cheese;
- 20% less fats;
- 50% more fresh fruit and vegetables.<sup>21</sup>

5.2 These changes in diets could have both positive and negative environmental impacts. For example, fewer numbers of livestock in the dairy and meat sectors may reduce GHG emissions but could have negative impacts on landscape character and biodiversity.<sup>22</sup>

5.3 According to surveys, half of consumers try to buy British when shopping for meat,<sup>23</sup> 21 % look for organic food,<sup>24</sup> and 59 % are interested in buying local food.<sup>25</sup> Most purchasing decisions, however, are still based upon self-benefit (e.g. value for money), and an interest in food and food issues does not always affect purchasing behaviour.<sup>26</sup>

5.4 To enable sustainable food consumption, the decisions made by those determining the choices available to consumers are important. Similarly, education can enable understanding of the origin and production methods of food, and ways to reduce its environmental impact. In 2007, a survey found that 35% of adults did not know that porridge oats come from British farms.<sup>27</sup>

5.5 Food labels need to inform consumers of the provenance and production methods of food, and leave no ambiguity about the origin and sustainability of food. A majority of consumers seek information from labels when making food purchase choices<sup>28</sup> but labels are currently more likely to confuse and mislead consumers than inform them.<sup>29</sup>

<sup>15</sup> Central Science Laboratory, Oxford Archaeology, and the European Forum on Nature Conservation and Pastoralism, 2002. *The Environmental Effects of Common Agricultural Policy Direct Aids to Farmers*. Research report for Defra. In Defra, 2002, *Analysis of the Environmental Effects of Common Agricultural Policy Direct Aids*. Report by the United Kingdom in compliance with Article 2.1(a) of Commission regulation (EC) No 963/2001.

<sup>16</sup> *State of the Natural Environment* report, Natural England, 2008.

<sup>17</sup> Natural England, *State of the Natural Environment* report, Natural England, 2008.

<sup>18</sup> Prof. Chris Pollock, "Law of competition for sunlight", presentation to the "Land of plenty" conference, May 2008.

<sup>19</sup> Department of Health, *Foresight Tackling Obesity: Future Choice*, DH, 2007.

<sup>20</sup> Department of Health, 2007 *op cit*.

<sup>21</sup> Arnoult M, "Food consumption changes in the UK under compliance with dietary guidelines", as part of the Rural Economy and Land Use (RELU) project "Implications of a nutrition driven food policy for land use and the rural environment", led by Reading University.

<sup>22</sup> Rural Economy and Land Use (RELU) project "Implications of a nutrition driven food policy for land use and the rural environment", led by Reading University.

<sup>23</sup> Mintel, *Attitudes Towards Buying Local Produce*, Mintel, 2003:

<sup>24</sup> Mintel, *Consumer Trends*, Mintel, Nov 2008.

<sup>25</sup> Institute of Grocery Distribution, *Local sourcing*, IGD, 2002

<sup>26</sup> *Consumer Attitudes to "Eat the View"*, Countryside Agency 2003.

<sup>27</sup> NFU/BBC Survey, 2004.

<sup>28</sup> MAFF, *Consumers Attitudes to Food Labelling*, Ministry of Agriculture Fisheries and Food, 2000.

<sup>29</sup> National Consumer Council, *Bamboozled, Baffled, and bombarded*, NCC, 2003.



5.6 Local and regional food economies can be important components in a range of supply chains required for food security. Less than 1% of food sold in supermarkets is currently “local”.<sup>30</sup> There is therefore potential for commercial local and regional food production and supply to play an enhanced role in ensuring the UK’s food security.

5.7 Allotments and other green infrastructure are vitally important for informal food production and as places for wildlife. “Growing your own” can increase people’s access to fresh fruit and vegetables,<sup>31</sup> and allows physical exercise and contact with the natural environment.<sup>32</sup> Sufficient land needs to be made available to local communities to enable them to participate in sustainable food production.

6.0 *What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

6.1 Farmers, fishermen, food businesses, consumers, civil society and Government have a shared responsibility for encouraging sustainability in food production and consumption. Government needs to lead in ensuring the nation’s food security, supported by the food industry and farming sector who share an interest in secure food supplies.

6.2 We welcome many of the actions which the UK Government is taking to address food and environmental security issues. As a public body ourselves, we are investing in the natural environment in England. This will contribute to ensuring food security by protecting the genetic diversity and ecosystems services which are required for food production, as well as delivering a range of other public benefits.

7.0 *How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

7.1 The Cabinet Office’s *Food Matters* report published in 2008 provides a first step in developing an integrated food policy across government. We welcome many of the commitments made in the report including the “Healthier Food Mark” and “Vision for a Sustainable Food System”.

7.2 Natural England’s work of relevance to this area includes our policy on CAP reform, Futures Scenarios, our delivery of the Environmental Stewardship scheme and our work to achieve more sustainable use of the Marine environment. We are currently developing our policy on Food Security and the Environment, and will be consulting with a wide range of stakeholders in the near future.

8.0 *What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

8.1 We note that Defra are developing a set of indicators in which to measure food security. In our response to Defra’s discussion document, *Ensuring the UK’s food security in the 21st Century*, we recommended that the set of indicators includes ones for environmental security. A set of indicators for monitoring environmental security could include:

- ecological integrity and services of land used for food production in UK;
- greenhouse gas emissions from farming and food system (from UK consumption);
- reduction in diffuse pollution by agriculture in UK;
- number and diversity of farmland birds and bees in UK;
- agricultural landscape quality and character in UK;
- stocks of fish and quality of marine environment in UK and international waters; and
- resource efficiency indicators (e.g. water, oil, waste).

8.2 We also recommended that any set of indicators includes a measure of the proportions of food produced in different spatial contexts (local, national, etc.), the diversity within primary production in the UK, such as number of mixed farms in the lowlands, and the UK’s “productive capacity” on a nutritional basis.

<sup>30</sup> New Economics Foundation 2006. “Local” defined as produced no more than 30 miles away from outlet in rural areas (up to 70 miles for cities), or within county (+ 10 from border) or National Character Area (+ 10 miles from border).

<sup>31</sup> See Bakkere N *et al*, *Growing Cities, Growing Food: Urban Agriculture on the Policy Agenda*, Deutsche Stiftung für International Entwicklung, April 2000, and Viljoen A *et al*, *Continuous Productive Urban Landscapes: Designing Urban Agriculture for Sustainable Cities*, Elsevier, 2005.

<sup>32</sup> See Garnet T, *Growing Food in Cities: the benefits of urban agriculture*, Sustain, 1999, and United Nations Development Programme, *Urban Agriculture: Food, Jobs and Sustainable Cities*, UNDP, 1998.

## 9.0 Conclusions and recommendations

9.1 By seeking a healthy and adaptable farming and food economy in the UK and Europe, and by protecting and enhancing a healthy and resilient natural environment, we will be able to respond positively to the challenge of food security in the future. In summary, the priorities for ensuring food and environmental security, should include:

### 9.2 Sustainable food production and supply

- mechanisms to reward farmers for the delivery of public goods (including the conservation of landscapes and biodiversity), where the market cannot do this;
- the greater use of market instruments for internalising external costs and benefits;
- investment with the aim of improving yields, reducing environmental impacts, and improving competitiveness;
- maintaining a range of adaptable supply chains, including strong local and regional food chains, and particularly encouraging those with the lowest environmental impact and least reliance on fossil fuels;
- reducing wastes in agriculture, food chains and households and improving resource efficiency in other areas such as water use; and
- provision of land and support for local community initiatives which encourage and allow greater citizen participation in sustainable food production, such as allotments.

### 9.3 Productive capacity in UK and Europe

- education and training aimed at ensuring a future supply of skilled and environmentally aware farmers, fishermen and food producers and support for mechanisms to enable the dissemination of knowledge and good practice;
- investing in research and development and extension of farming practices, techniques, designs and technologies that can facilitate productive and sustainable agricultural systems with a low risk to the natural environment;
- protection of the marine environment and fisheries, in order to ensure a sustainable supply of fish and other seafood in the future; and
- protection of fertile land and managing the extent to which farmland can be permanently converted to other uses, whilst allowing for the creation of new habitats, coastal change, and rural development.

### 9.4 Trade and standards

- development of minimum mandatory international environmental standards for food and agricultural commodities in trade, and allowance for countries to retain controls over their food systems for social and environmental reasons when necessary; and
- policy measures for managing existing standards and encouraging appropriate voluntary environmental standards for food.

### 9.5 Sustainable consumption

- encouraging more sustainable consumption patterns and diets, such as reducing the amount of grain-fed meat consumed;
- retailers, caterers and manufacturers applying corporate social responsibility principles to their sourcing policies, food chain standards, and products offered;
- accurate, honest and effective labelling to increase awareness of the production methods and origin of food to allow more sustainable food choices;
- education of citizens from a young age about food and the environment so that people can make sustainable and healthy food choices throughout their lives; and
- public procurement of food and catering to support and act as an exemplar for more sustainable food production and consumption.

January 2009

*Witness:* **Mr Andrew Wood**, Executive Director, Evidence and Policy, Natural England, gave evidence.

**Q344 Chairman:** It is three o'clock, can I formally welcome everybody to our further evidence session on the Committee's inquiry, Securing Food Supplies up to 2050: The Challenge for the UK, and can I particularly welcome Mr Andrew Wood, the Executive Director for Evidence and Policy for Natural England. Mr Wood, thank you very much

for coming this afternoon and thank you for sending the written evidence. We have a number of specific questions that we want to ask you but I just wanted to raise with you a little bit of a concern I had about the evidence you sent in. I started to read it and, for example, I came in the fourth bullet point paragraph on the first page to where it said: "In the long term,

18 March 2009 Mr Andrew Wood

global food production is likely to need to increase.” I hoped that somewhere in your evidence there might be something to tell me what the word “likely” meant, taking into account that the world’s population is predicted to continue to rise, at least until 2050, but I am afraid I did not find an answer. Could you explain to me what this “likely” is—it almost sounds as though you are not really sure whether global food production does need to increase or not; what is your view?

**Mr Wood:** Thank you Chairman and thank you for the opportunity to be here. We believe that food production globally probably will need to increase but you have to have some doubts for a number of reasons: first because population growth projections are projections and we cannot be certain how far it will go at this stage and, more to the point, it seems unlikely that health services globally could sustain the sort of rise that is currently projected on trend alone. That is the first point. The second point is that food production growing to match that is predicated in most of the predictions on not only current consumption levels in western societies but new consumption patterns in other societies where we have the happy assumption collectively that, particularly in India and China, people will switch to increasingly western lifestyles. We cannot prove that. Finally, because across the world we have something like a billion people who are overweight and 300 million who are clinically obese—in this country alone 25% of the adult population is clinically obese—they do not eat healthy diets. If they were to shift to the sort of nutritional levels that are advocated by the World Health Organisation then their consumption would fall rather than rise.

**Q345 Chairman:** I know you go on in your evidence to talk about waste and the amount of waste that we produce; what I was hoping was that you might be able—and I respect the fact that you may have reservations about other people’s projections and we will come on to talk about the FAO targets in a moment—to give us something that gave us a little bit more of a feel as to the implications; for example, if your thoughts on how much we might save if we were less obese had been actually translated into some kind of land use impacts. I noticed that in paragraph 5.1 of your evidence you make some projections, if we had what we defined as a healthy diet, as to the percentage reductions in what people would eat, but the evidence does not then helpfully go to translate that into what does it mean for land use, either in the United Kingdom or within Europe. In fairness, you have produced a Natural England position statement on the Common Agricultural Policy and, whatever happens, this paragraph does have an impact on the security of food supply. Have you actually done any work to try and make a relationship between food waste, dietary change and land use patterns?

**Mr Wood:** It is work we have got ongoing; we are looking at land use in the round and we hope to be able to publish something in 2010. The most obvious answer is simply to say there are too many variables so we could come up with a range but I would be

quite sceptical of anybody who said, “And the answer is X”, because the answer is highly unlikely to be one number we can all be confident in; it is much more likely to lie within a range.

**Q346 Chairman:** That is one of the things I found, if I may say so, a bit frustrating about some of the evidence, that it was quite long on aspiration, hope and general description but rather short on taking it to the next bit that would give us some objective facts upon which to work, and I suspect we are going to return to that as we proceed. Let me just come back to this question of target-setting. Yours is the first organisation—and you may be, like the little boy who spotted that the king was in his altogether in Hans Christian Andersen’s fairy-tale—to have questioned the FAO’s targets which indicated a 50% increase in food production by 2030 and a doubling by 2050, but let us say just for argument’s sake that they are wrong. What nobody seems to be arguing is that we will not need more production of food. Are you arguing that you think we can get by with what we have got simply because we ought to be able to make better use of it?

**Mr Wood:** No, we are not, Chairman.

**Q347 Chairman:** If that is not the case can you give us any feel for how you actually see those targets or is that still in the work in progress column?

**Mr Wood:** It is partly work in progress. We see the targets as being the best numbers that anybody has come up with so far, but if you were to put your faith in those numbers and those numbers alone you could set off down lots of wrong paths. They are based on projections and assumptions, there is science that supports some of the argument but not all of it and, this far out, we simply do not know.

**Q348 Chairman:** In terms of helping us to decide how the United Kingdom should respond to the challenge of additional food production you almost seem to be saying, yes, it might need to go up but we do not really need to do anything in the UK; we do not have to be a player in terms of a world response to questions of global food security or insecurity if the rising numbers of the world’s population represent further pressure on the food supply chain system which, in recent times, wobbled both in terms of physical supply and the price of the product. Is that a fair summary of where you stand on the issue and, if so, why?

**Mr Wood:** It is not at all a fair summary, if you will forgive me Chairman.

**Q349 Chairman:** No, you can be as challenging as you like.

**Mr Wood:** We believe that the United Kingdom can and should make a contribution. We do not believe that that is necessarily in the realm of increased production although there may well be an element of that. We certainly have something to give to the rest of the world in terms of technology transfer, exchange of expertise, both in agricultural production and in environmental welfare and we should play a role there. We have not been a huge

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 18 March 2009 Mr Andrew Wood
 

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exporter of food for many years now. It is a very long time since we could sustainably feed ourselves simply within these shores and that is highly unlikely to change in the short or medium term. We can look at the food that we import from other countries, the impacts that that has on the diet of local communities there, their overall production and food security globally in the round. There is therefore quite a lot that we can and should do.

**Q350 Chairman:** The reason I mention that is—I just quote from paragraph 3.6 of your evidence—you did actually say: “Increasing food production in the UK to address global food insecurity concerns is unlikely to make a significant contribution to addressing the problem.” I suppose it does depend on how you define “significant”, but, given that there is a complex global supply chain, one does not know outwith the United Kingdom what might happen with the kind of pressures that could be put on that supply chain in the future. Certainly when we visited Rothamsted last week there was a view that we almost had a duty to exploit the good agricultural land that we have and to maximise its production, taking into account that global warming may make Western Europe a more propitious place for the type of agriculture that we, if you like, excel at, and therefore we have a duty to maximise the production taking into account those medium and long-term trends. Is that an argument that you would care to comment on?

**Mr Wood:** It is an argument that is valid up to a point and the point it struggles with is that it does not go far enough. Plainly, if there is a contribution that we can make we ought to look at making it, but we have to do that within the constraints of sustainability; to chase production at all costs is a short road to madness. We have done significant damage to the natural environment by chasing production in the past. We have struggled to put some of that right more recently and the farming communities made huge efforts to do that. To throw all that away now would be, frankly, silly. Ultimately, the best guarantee of food security globally and in the United Kingdom is a healthy, natural environment. If we have production at the expense of that then production itself will suffer eventually.

**Q351 Chairman:** What work have you done or are you doing to answer the question, if we do have a push for increased yield and indeed want to take more land, particularly in the arable sector, into production, as to what the biodiversity consequences are of doing just that? Have you actually got, if you like, a ready reckoner that one could use or a computer model, to be more specific, which would help us to understand what the biodiversity consequences are if, under whatever assumptions you choose to make, you were to try to increase production? I will give you an example: when the NFU came to see us they told us that in their judgment, using current agricultural technology, you could move from a wheat yield of something like ten tonnes per hectare to as high as

19. Without telling you what Rothamsted said, they gave us an indication of what the consequences of that would be. Have you done an exercise to work out what, in your judgment, the consequences would be?

**Mr Wood:** No, we have not and I dearly wish we had the sort of computer model you have just described, but if we look backward the consequences plainly would not be good. If you look at the very short periods of time where we chased production to the exclusion of any other consideration, supported by government subsidy, we did significant damage to particular pieces of the environment in ways that are difficult to replace. In six years in the early eighties we lost 20,000 kilometres of hedgerows simply because we wanted to make production better. The biodiversity loss that goes along with that is incalculable.

**Q352 Chairman:** I understand what you are saying and one hopes, particularly as a result of learning from past mistakes, lessons for example in terms of the impact of biodiversity, of set-aside and of the fact that we are learning from the fact that farm payments are now linked in certain cases to environmental objectives, target-setting et cetera, that we might start off from a rather better place this time if you were pushing for production. Even if you have not got it nailed down with a computer model, is there anything you can do to help us understand the consequences, in objective terms, of a further push for agricultural production, taking into account modern agricultural techniques, both in terms of the greater precision use of, for example, agrochemicals, satellite-guided harvesting and all the other panoply of technology that is around? I need to understand what happens if you go from ten to 11 to 12 tonnes to the hectare, what are the consequences.

**Mr Wood:** I am not—and I do not believe anybody else is—in a position to tell you that, Chairman.

**Q353 Chairman:** How are you going to advise Defra when the hapless minister gets up and makes a great speech at the NFU AGM praising the ability of British farmers to produce more, and then you have to quietly tap him on the shoulder and say “Excuse me, Mr Benn, there is a consequence to what you have just said but I cannot tell you what it is”?

**Mr Wood:** That would be the sad position we might be in today, but I would hope it would not be in the future and I do not think anybody is arguing that we need to boost production this minute. I believe that some of your earlier witnesses have called quite strongly for more research and you might expect that somebody who has got evidence in his job title would agree with that; sadly, I do. We have stepped back from publicly-funded research for all sorts of good and sufficient reasons in the last 20 or 30 years. We have learned today that the private sector pursues research where it sees profit—Shell have told us that with their decision about renewables—and in this area there are simply lots of things we do not know

18 March 2009 Mr Andrew Wood

and we do need more research. The NFU and the CLA have said that to you and they are absolutely right.

**Q354 Dan Rogerson:** Before I come on to another matter, just further to what the Chairman has been asking you about, the policies that you pursue in terms of working with farmers and so on to achieve environmental objectives, I guess in all of these things there must be a balancing exercise between the various goals that are trying to be achieved to help the farmer, the rural community, biodiversity and all the rest of it. Do you foresee the sorts of issues that we are talking about changing the equation at all in the sorts of projects that you pursue and in what you see your role as being, sort of fundamental to what you do?

**Mr Wood:** It does not necessarily change the balance. We need to know more about what the appropriate balance is and we have to understand that the balance is not simply production versus the environment—indeed, if we lock ourselves into a debate about that we will lose. The balance needs to consider the whole range of—I apologise for the jargon—ecosystem goods and services, we need to look at water quality, air quality, flood prevention, access for people, development, food production and biodiversity. There is no reason why increased food production and a healthy natural environment should not co-exist. The Chairman has already pointed to some of the techniques which are available that make that easier. The precision use of fertilisers, for example, at its best means you use less, you use them in appropriate places so run-off is less and impacts are less. We can pursue things like that and find a way through that, but the ultimate truth is that this is a small island, heavily populated, with only so much space. If we give overriding primacy to any one of the things I have just briefly described then we run the risk of upsetting a balance that is in essence the sustainability of modern society.

**Q355 Dan Rogerson:** We could get into an extended debate on some of those issues and perhaps this is not the right time to do it. The department that we scrutinise and the Committee itself, we contain in our respective job titles environment, food and rural affairs and one of the things that has come up in previous inquiries, as well as this one, in people's evidence to us (for example the NFU) is the potential conflict there is within the department between the environmental aims and objectives and the need to give direction in terms of food production and food issues. Do you think it is fair to say that the department, since its creation, has concentrated more on the environmental aspects of its portfolio than on the food side?

**Mr Wood:** No. It has certainly brought the environment to bear in a way that was not true previously and we believe that that is a good thing. Its focus on climate change has been helpful and the most recent developments in policy thinking within the department have been in terms of the shift to ecosystem services as I mentioned earlier; that promises a more integrated approach. It has stopped

being what it was once caricatured as being, which was as a spokesman for agriculture within government and that is probably a healthy thing. Political fashions, you know much better than I, come and go and tend to do so in a pendulum fashion and there is always the risk that they will go too far. The department is heavily staffed with policy divisions that look after food and agriculture and have at least as loud a voice as their environmental policy. The debate over set-aside is plentiful evidence of that.

**Q356 Dan Rogerson:** It is quite interesting that you talk about the department or its predecessors as being spokespersons for agriculture in government, and you say that they are not doing that now. What you are saying is that no one is doing that job because if they are not doing it no one is, so how do we resolve that in light of the issues that we are talking about here about food security but also the rural economy and so on that needs to have a productive and alive community in rural areas? How do you think we do that? What role does Natural England have in achieving that?

**Mr Wood:** You exaggerate slightly what I said. The department has stopped regarding the agricultural sector as its client body but there is still a voice for agriculture within policy debates. Plainly, we all have a role to play. The point of creating Natural England in the way that we were created was to provide integration, to provide a voice that considered the natural environment, people and agriculture—that is why we are responsible for RDPE.<sup>33</sup> I think we provide that voice quite successfully a lot of the time. Plainly there are issues on which we will favour one side of the balance against another because that is what we are paid to do and that is where the argument lies, but there are lots of people who speak up for agriculture and it is plainly fundamentally important to us as a society and fundamentally important too to the natural environment, so we would be barmy if we did not.

**Q357 Paddy Tipping:** You told us a minute ago that political fashions come and go. That is true but where has this argument for food security come from? It was not on the agenda four years ago and now it is pretty high up.

**Mr Wood:** Some of your other witnesses who have propagated the argument could probably have given you a better answer. It has certainly come from the projections that we were talking about at the beginning of the session. There is an evidence base—it is not sufficient—that says that food is an issue and the events of the last couple of years with the sudden spike in commodity prices have given it prominence and, I think, naturally scared a lot of people, but what we have seen is that those have dropped again. It has plainly come because spokesmen for particular points of view will make an argument with the tools they have to hand.

<sup>33</sup> Rural Development Programme for England.

18 March 2009 Mr Andrew Wood

**Q358 Paddy Tipping:** In your evidence you are very clear that payments to farmers and landowners ought to be made for public goods and environmental goods rather than payments for production, and that has been the way we have moved. Does it surprise you that people have said to us that we ought to get back to direct payments?

**Mr Wood:** It does not surprise me at all but it will not surprise you to learn that we do not believe that that is right.

**Q359 Paddy Tipping:** Are there circumstances where you think it would be acceptable for the wider public good to do some environmental damage? Let me give you an example. I go to the Yorkshire Dales quite a lot and I stand and look down over Wharfedale. That landscape has changed over the years and it is not natural, it is manmade. How do you square that with the need to have good management practices to increase the productive environment whilst safeguarding the obvious benefits in the environment?

**Mr Wood:** As a society we constantly trade-off, do we not, and we make judgments on particular cases. We would argue that we should seek solutions that protect the environment and, where possible, enhance it, and you can see a whole trend, particularly now in housing development, where enhancing the environment can be a consequence of that development. To take an obvious example, the Eastern Quarry not far from here in the Thames Gateway is a large arid hole in the earth as a result of extraction. The plan, certainly until the recession, was to build several thousand homes there, and the developers planned into that green space, open water and a generally enhanced environment not only for the new development but linking it into Ebbsfleet and developments from immediately after the war which were pretty impoverished environmentally, so you can do that. Sometimes we decide for reasons of overriding public interest that a big development has to happen in a particular place and sometimes that is right.

**Q360 Paddy Tipping:** Who should judge those trade-offs?

**Mr Wood:** Society has to find ways to judge those trade-offs and ultimately it elects you to take the final decisions on that, and that is entirely appropriate. We hope always that you do that with the benefit of the best advice that you can get from us or from anybody else.

**Q361 Paddy Tipping:** Can I ask you more specifically about the Higher Level of Stewardship? How do you rate it as a programme?

**Mr Wood:** We rate it very highly as a programme. We think it is visibly beginning to make a difference and it is an absolutely critical tool in achieving better conditions for our most vulnerable sites, but beyond the SSSI<sup>34</sup> series or European designations, if we are going to deliver on our ambitions to restore and

protect a biodiversity action plan for priority habitats and to a lesser extent species, then HLS is absolutely fundamental to that.

**Q362 Paddy Tipping:** Can everybody get into it who wants to?

**Mr Wood:** We are not oversubscribed as things stand.

**Q363 Paddy Tipping:** Why is that? If it is such a good scheme why are not farmers and landowners knocking on your door?

**Mr Wood:** Because a farmer will quite properly make an economic calculation at a point in time. Lots have made the calculation and applied for the scheme, lots are in the older, so-called classic schemes and we are working with them to look at renewal.

**Q364 Paddy Tipping:** Could you just explain that to me a bit more, what is a classic scheme? It sounds like a car to me.

**Mr Wood:** The classic scheme means any form of environmental stewardship pre HLS and ELS<sup>35</sup> and my reference to BAP<sup>36</sup> is that we have got about 65% of BAP habitats in good condition, overwhelmingly because we have land managers in so-called classic schemes. To sustain that and improve upon it we need them to transfer.

**Q365 Paddy Tipping:** This is a very naïve and simple point but somebody in the HLS can protect the environment in a very rigorous kind of way but would be able to increase production too.

**Mr Wood:** Yes, absolutely.

**Q366 Dan Rogerson:** Briefly on HLS, a lot of things have been raised with me by some farmers in my constituency—and we have a lot of SSSIs and so on—about HLS and the amount of work that goes into the application for it and the engagement with consultants or whatever, and advisers, all sorts of things, and that the process is as much a disincentive as the actual operation of the scheme. Do you think that is a fair criticism and what could be done to change that?

**Mr Wood:** It is probably a fair criticism now and I will defensively say that part of that is to do with European scheme rules and so forth where we simply have to follow a book of rules. We have taken steps at the payments end of the process to make our processing times much, much faster, so we have a target set by the scheme of making payments within 30 days, and we make them within two and a half so we have done that bit of the job. The other bit of the job is the application end. We have a series of changes in hand that will come to bear in 2010 that will make application forms easier, that will make the application process as a whole easier and, critically, quicker. One of the slightly hidebound arrangements that we inherited was the making of maps and, coupled with that, the assumption that you had to strike a deal with the farmer that was

<sup>34</sup> Sites of Specific Scientific Interest.

<sup>35</sup> Entry Level Stewardship.

<sup>36</sup> Biodiversity Action Plan.

18 March 2009 Mr Andrew Wood

going to exist for the lifetime of the agreement. We would like first to move away from absolutely mapping every last dot at the point you make the agreement to relying on something that was broader brush and then move back to do more accurate mapping subsequently—that would speed things up—and we are very keen to get people into starter agreements and then build them as their own confidence in managing the scheme grows and as they see further opportunities to have a scheme that can evolve over two or three years instead of having to get it right in all its details first time out.

**Q367 Lynne Jones:** You answered yes to Paddy Tipping's question about increasing productivity within the context of higher level stewardship and in your submission you make comments like "improving the environmental performance of agriculture and increasing food production is potentially possible..." and "There are many opportunities for improving and restoring the quality of soils in England which would support agricultural productivity..."<sup>37</sup> but can you tell us how we can, if you like, have our cake and eat it, have improved agricultural production whilst maintaining the quality of the environment? You have said we could do it but can you give us some ideas of what in practical terms we should be doing to achieve that aim?

**Mr Wood:** We have to consider this at a range of scales, so the precision targeting of fertilisers that we talked about earlier works well on a large scale in arable prairies in East Anglia and the East Midlands, there is no doubt about that. That is an easy win and lots of farms already do that. On a much smaller scale in other places we could look to a change of systems and my piece of jargon here is agro-ecology—agro-ecological farming systems pursue farming through something that fits with a standard ecological system and, typically, that can involve growing more than one crop in the same place and if you look for an easy but, I confess, slightly glib example of that the under-grazing of orchards is something that used to happen in this country a great deal—I can remember my grandfather doing it—so you can have apples and pears and you can have sheep or pigs<sup>38</sup> around the roots of the trees. That is comparatively easy. At almost all scales you can look at things like integrated use of pesticides—that can make a difference—and we should look at much more sensitive use of natural pest control which is proven to work with even relatively intensive farming. None of these are panaceas across the piece and again we need to do lots of work, and the farming industry and environmentalists together need to do lots of work to see how you could best deploy those sorts of solutions.

**Q368 Chairman:** Is that an explanation therefore for paragraph 4.24 where you say "But, it is possible for biodiversity to have an agronomic value by, for

example, being part of an ecosystem that suppresses pest and disease populations to below yield damaging levels?"<sup>39</sup>

**Mr Wood:** Yes.

**Q369 Chairman:** You cannot quantify any of that for us? I understand with greater clarity what the concept is but if you had, say, 500 acres or whatever it is in hectares' worth of arable crop and it was grown on strictly conventional means, and you came along and said to the farmer, "We have got to improve the biodiversity of the way that you produce your arable crop, and we want to change the current situation so that the biodiversity regime we introduce would have agronomic value and would suppress pests and diseases below yield damaging levels"—can you perhaps write to us and let us know what it actually means in reality?

**Mr Wood:** I would be happy to do so, yes.

**Q370 Chairman:** Just so I can get a feel for what it is that we are asking farmers to do.

**Mr Wood:** Certainly, yes.

**Q371 Chairman:** Having done that how robust are such systems because are you 1% below or 2% below or whatever per cent below in terms of yield damaging, what that says to me is you can take the edge off it. In other words, an agrochemical may stop the pest dead in its tracks but an ecosystem-based thing may diminish but not entirely remove the yield diminishing threat. If you could just give feel as to the difference, if you like, between the use of agrochemicals and the system you have described in terms of yield loss, that would be very helpful.

**Mr Wood:** We will put that in a letter Chairman.

**Chairman:** Thank you very much indeed. David.

**Q372 David Lepper:** If we assume that one of the overriding aims of government is to tackle climate change, Tim Lang in one of our early sessions, as you may know, was quite clear in saying Britain is producing too much meat and dairy; we should lower it and treat meat and dairy as one of the quickest and most fundamental ways in which we can lower our carbon emissions. You say, on the other hand, yes, that is so, but to reduce the dairy and meat sectors could cause other environmental damage particularly to character of landscape, biodiversity, et cetera. Can we square those competing views about priorities? You seem to be saying landscape, character, biodiversity, it is crucial that we protect, maintain and conserve but there may be a price to pay in doing so.

**Mr Wood:** Sadly, there is always a price to pay and the dilemma that you pose is not an easy one. Taking the particular example of livestock and dairy, we feed a significant proportion of our livestock on cereals currently; therefore that use is in competition with human food and they are cereals that are typically produced with lots of inputs. You could shift a lot of that production to pasture and you would get rid of a lot of the inputs straightaway; that

<sup>37</sup> Ev 145

<sup>38</sup> *Witness amendment:* sheep or poultry around the roots of the trees.

<sup>39</sup> Ev 147

18 March 2009 Mr Andrew Wood

is a win for the environment. We know that a significant proportion of the population eat unhealthily and Professor Lang is right: if you are going to correct that then typically they would eat a bit less meat, probably a lot less cheese and significantly more fruit and vegetables, and there is probably some gain for the natural environment in making that sort of switch. It has, plainly, economic consequences for farmers and the market in part will determine that. As for the climate change end of this, climate change is happening now, lots of the impacts are locked in for the next 30 years and that is going to have an impact on species, on habitat and ultimately therefore on land use for the sort of crops that we can grow. Some of the impacts are beneficial, certainly in agricultural terms. The British livestock herd is a contributor to climate change: it emits greenhouse gases, we all know that, and the notion that you would go to the ultimate point of getting rid of that and we all go vegetarian is, I suspect, the sort of draconian solution that no government in the foreseeable future would be attracted to. Reducing the size of the herd might well be desirable in those terms, but it is not an easy solution. There is not a magic bullet here.

**Q373 David Lepper:** With the sort of scenario that you have just described and, yes, you are honest in saying there is no magic bullet obviously, you have also suggested that in a way the market is the determining factor in bringing about change if it is desirable to have change. What about the role of government?

**Mr Wood:** Government plainly has a role too and that is largely what we have been talking about. The market will determine broadly how farmers are rewarded for what they produce, that has to be the starting point. The Government then needs to decide what it wants to incentivise, whether it is particular commodities, particular forms of production, production as a whole or looking after the environment. We have made big choices about that in recent years and some of them were demonstrably flawed. Draining the uplands to increase production was completely barmy and we suffered the consequences of that 20 or 30 years later. Government plainly has a role but it needs to play that role sensibly against a broad range of considerations and not be stampeded into a dash for production just because a lot of people are calling for it today.

**Q374 Dr Strang:** You circulated the position paper you produced last year on the Common Agricultural Policy; to what extent do you think the current Common Agricultural Policy should be about food production as well as safeguarding the natural environment?

**Mr Wood:** There is nothing to suggest currently that we should make that sort of retrograde step. Europe feeds itself quite successfully and exports a bit; there is no overwhelming driver for making that switch and if we made that switch then we would lose things that we have gained over the last 15 to 20 years.

**Q375 Dr Strang:** There have already been some questions on this question of how you reconcile or how you might reconcile increased production in the UK with our environmental objectives. Would one way forward be to maximise the production of the fertile land in order to have more land uncultivated for natural reasons?

**Mr Wood:** It is a possible approach but we would have to tread very carefully. Fertile land is itself a competitive market, not only for food production but for other things, and we have produced some of our most fertile land in England by draining the Fens. The consequence of that is that peat soil erodes, loses its carbon and will not last very much longer. Again, I would advocate caution but I think it is clear that the sort of technological and scientific progress we have made in agriculture over the last 50 years can be pushed further and, as we become more sensitive about that, can be pushed further without necessarily harming the natural environment.

**Q376 Dr Strang:** We are well down the road of designating areas of the farm that the farmer has got with stewardship schemes and everything else so it might be practical.

**Mr Wood:** Yes.

**Q377 Chairman:** Can I just probe you a little bit about the statement you put out because you said, “In the medium term the CAP needs to develop into a policy that maintains multifunctional land use and helps to build and maintain a new social contract between farmers and the rest of society.”<sup>40</sup> I am interested in the terms of this contract and who is going to set it.

**Mr Wood:** The contract is already there in part through RDPE. RDPE means that we make agri-environment payments not only for biodiversity benefit but also for access for the protection of the historic environment and for resource protection.

**Q378 Lynne Jones:** Could you say what RDPE is, please?

**Mr Wood:** Sorry, the Rural Development Programme for England, which, confusingly, is the successor to ERDP<sup>41</sup>—you simply need to reverse the words—which you had until a couple of years ago. It is the agri-environment scheme money; it is £400 million a year of support to farmers for environmental gain. The contract, Chairman, can be based around that. Farmers need to be able to farm; they produce things that we all value. They farm and have farmed for many years now, supported by the public, and there is a legitimate expectation of some exchange because of that; that exchange takes a variety of forms: biodiversity is one of them and access is one of the others.

**Q379 Chairman:** Some of the highly specialised farmers might wonder a little bit about one of the points you mention where you say, “Farmers would

<sup>40</sup> Natural England Policy Position Statement on CAP Reform, January 2008 <http://www.naturalengland.org.uk/Images/capreform-pps—tcm6-5991.pdf>

<sup>41</sup> The England Rural Development Programme



18 March 2009 Mr Andrew Wood

see managing the natural environment as one of their primary roles and the public would see them as guardians of the environment and be willing to pay for these ‘public goods’ through general taxation.”<sup>42</sup> I suppose some might argue that the public do not have much choice because that is what they are doing at the moment and it is the European Union, together with the government of the day, which decide in more detail how that money shall be deployed, programme by programme. In the context of food security some might argue that the principal task of the farmer is to produce food and to do it in a sustainable way but not to have it as, if you like, a parallel number one responsibility in terms of what you say here, “managing the natural environment”. There are some, for example, who might have put their farms into the old “whole farm” set-aside scheme who you could say were managing their land for the natural environment, but if there is a push for food do you think that it is possible to run such a parallel regime where both priorities of the environment and food are seen in equal measure?

**Mr Wood:** It has to be possible; the consequences of it not being pursued do not bear thinking about. Across the course of human agriculture we have used around 7,000 species of plants and several hundreds of species of animals; most of those no longer exist because we have farmed them, we have bred them, out of existence. The natural environment around that provides a bank that we can replenish that from, so we have to have both. Agriculture takes 70% of England’s land; that is rather more than 70% of the natural environment because another 11% or so is in towns and cities. To suggest that farmers could just produce and pursue food—which plainly is their business—to the exclusion of the environment would be to throw the remnants of the natural environment we have away, so we have to have them pursuing both. Part of our argument rests on public appreciation of what they are doing, so you are entirely right that the public have no choice (or not very much choice) about where their tax pound goes, but the public once upon a time were very happy to support farmers to produce because the public had lived through the last war and production was seen as absolutely essential. The public became, gradually, over the 70s and 80s, disenchanted with supporting farmers when most other industries were not supported—I suppose bankers have helped to put that right more recently. We need public support for farming, for farming for food, and one way of getting that is public support for farming for a natural environment—for landscape, for farmland birds, for places that are nice to see for a better quality of life, all those trite phrases.

**Q380 Chairman:** Who within the European Union do you see as Britain’s natural allies in following the proposals that you have just espoused?

**Mr Wood:** To some extent the northern European countries are the most obvious ones. I am no expert on the politics of the EU but the position of the French in relation to agriculture is quite well known.

In Mediterranean countries they have typically over a long time pursued subsidy and eastern European countries, coming into it anew, to some extent are a clean sheet of paper. Whilst they might well want to modernise their production and certainly have the capability to produce more than they are currently producing, there is an opportunity for a debate there that does lead you to a win-win, so there are some allies but we need to recognise there is opposition too.

**Q381 Chairman:** Are there any parallel organisations to Natural England in other parts of the European Union that you are aware of or have contact with?

**Mr Wood:** There are, yes, typically in the countries I have just described.

**Q382 Chairman:** Those are your mates.

**Mr Wood:** We hope so, yes. We have particularly good relationships with the Germans and the Dutch.

**Q383 Chairman:** Some might argue that if we do maximise the potential biodiversity the consequences are that we are not going to produce as much theoretically as we could; therefore we are exporting our biodiversity challenge to somebody else because you might say they will produce it and they may have to go hell for leather for the production; we are a relatively rich country, we can buy their product, so that is all right then, so you can have degradation somewhere else and we are sitting here thinking in a nirvana of perfection that we have done our bit for biodiversity but actually we have a negative account somewhere else. How does that argument play with Natural England?

**Mr Wood:** Not very well. Biodiversity perfection, if it does exist, in this country would look like this country quite a long time ago. I do not think anybody, least of all Natural England, is arguing for that, Chairman, and we certainly do not believe that we should export our problems elsewhere. We currently produce about 60% of our own food and that is a reasonably sustainable model. We have food chains that take us largely into Europe as well and to some extent further afield. To suggest that we return vast tracts of currently agricultural land into some restored wilderness is wishful thinking on the part of the slightly more extreme environmentalists because we could not sustain 60 million people like that.

**Q384 Chairman:** In terms of the arguments that, for example, were put forward in May and June last year, where clearly there was a recognition that there was going to have to be more agricultural production, particularly in sub-Saharan Africa and the southern hemisphere, there are some potentially very major environmental degradation issues that arise. The Committee, for example, is planning to go to Brazil to try and learn more about them, but how should the Government here respond to that type of challenge when in fact it may in equal measure be looking to, for example, Brazilians to produce more food, for which we might ultimately end up being a customer?

<sup>42</sup> Natural England Policy Position Statement on CAP Reform

18 March 2009 **Mr Andrew Wood**

**Mr Wood:** The Brazilians need to produce food for their own population first and we are in a position to help them with that. If you step outside of the comparatively limited bits of intensive production in countries like Kenya producing cut flowers and miniature sweetcorn that tastes of nothing, you have agriculture that is almost as far removed as you can get from intensive. They could move a long way, they could increase their yields a great deal with help from us in a way that did not do significant damage to their natural environment. That is the space that we should occupy.

**Q385 Lynne Jones:** You discussed earlier the need to change our diets and there was also the issue about the sustainability of our food and food safety. These responsibilities are within different departments in government. Do you think that these structures' current set-up is adequate or have you got any ideas about whether there should be some restructuring so that perhaps one department is responsible for all these aspects of our food production and consumption?

**Mr Wood:** The evidence of Defra's success so far—in so far as it has been successful—has been that bringing issues together works and makes a difference. Current divisions around food are largely as between food production and issues to do with health; I do not think I would argue for the Balkanisation of the Department of Health but I think that—I apologise I resort to cliché at this point—joined-up government is plainly absolutely critical around this. If we are to persuade people out of current bad habits that are bad for their health, that are ultimately bad for society as a whole and for the environment, then we need to do that alongside an understanding of food in the round, whether that is packaging, supply chains, transportation or the impacts of climate change as a result of that or food production per se.

**Q386 Lynne Jones:** Have you any ideas about how that could be improved? Is it sufficiently joined up at the moment?

**Mr Wood:** No, and it very rarely is. Apologies, my personal experience of this sort of thing is having worked for some years in the NHS where the first resort rather than the last resort is to reorganise. No reorganisation ever produces the right answer because there is not a right one: there are a series of compromises, so I do not think big structural change is necessarily the answer here. What the Civil Service and the public service more generally are crying out for, and in some places have had some of, is cultural change, a change that moves people away from an assumption that knowledge is power and therefore I am more powerful if I do not tell you what I know, into an assumption that is about openness and sharing. You cannot compel that by making people work in the same room together. You can begin to encourage it by ensuring that we talk to each other. I know that sounds like it might take a long time, and I suspect it will, but in the end, in government and in most other areas, hearts and minds works a lot better than compulsion.

**Q387 Lynne Jones:** But how are you going to bring that about? It is all very well saying that. You have said that it is not joined-up at the moment, you are not advocating any restructuring, and you just seemed to say, "Well, there needs to be a culture change." How is that to be brought about?

**Mr Wood:** I think it can be brought about by those of us who inhabit more integrated worlds setting an example. I think it can be brought about by beginning to develop a common narrative so that we have shared objectives. Natural England is caricatured very often, sometimes a bit fairly and sometimes not at all, as having a sort of Punch and Judy relationship with the NFU, but the truth of the matter is that we do business with the NFU and its membership on a daily basis. We talk to each other a lot and we slowly move our way to shared objectives. We do not agree about everything, we never will—that is the nature of life—but you can demonstrate that it can happen. The experience so far with the Department for Energy and Climate Change strongly suggests that simply reorganising and doing some badge engineering does not make a fundamental difference in anything like the short term.<sup>43</sup>

**Q388 Lynne Jones:** Do you have any specific recommendation that we could make on this point in our report?

**Mr Wood:** I do not think I came here prepared to offer you a recommendation on structural change; I am sorry—the department, certainly, by giving weight to the newly created Council of Food Advisers, by giving them prominence. I would suggest that expanding them—because their membership, which is the great and good, as is traditional in Whitehall, lacks a lot of practitioners (it has a former president of the NFU but no current members, for example)<sup>44</sup>—could make a difference. That could give the issue prominence and it could begin to drive an agenda that is around bringing people together. I think, also, that we do need to get back to something we touched on in passing earlier, which is the scientific base and the research base for all of this, and we could invest more in common programmes rather than every department pursuing its own particular interest. We could use the good offices of the Chief Scientist to drive that much more intelligently.

**Q389 Lynne Jones:** What about the responsibilities of the food chain, the food manufactures and retailers in this area?

**Mr Wood:** We plainly need them to be more responsible than they are now. We have seen interesting changes in the very recent past which show that they are prepared to accept responsibility for what they do. The reduction in giving away of plastic bags, just as an obvious example, makes a genuine difference. Plainly they are in business to

<sup>43</sup> *Witness amendment:* According to a story in The Times a few days ago.

<sup>44</sup> *Witness amendment:* (it has a former Chairman of the Meat and Livestock Commission but no current members, for example)

18 March 2009 Mr Andrew Wood

look after their shareholders, their profitability, and they will inevitably chase that, but accreditation of foods, better labelling, are all things that they could do. If I step entirely outside the bounds of the current discussion, we need to think better about logistics and the infrastructure that supports that. We have the inanity of goods being shipped into this country on the Humber being trucked across the Midlands to distribution centres in Gloucestershire and then trucked back to Newcastle. I am sure that is serving somebody's purpose but it does little good to the general public and less to the natural environment. The notion of short sea shipping, which those of us of a certain age would think of as coastal freight, has a part to play in this: lower carbon emissions, less congestion, and goods delivered more promptly to where people want to use them. Retailers and manufacturers have a part to play in that sort of debate.

**Q390 Lynne Jones:** You have given us an example, if you like, where there has been responsible behaviour in terms of the plastic bags and then irresponsible behaviour. What are the mechanisms for encouraging those in the supply chain and retailers to move towards more sustainable production? What are the driving forces to make them behave better, do you think? Is that something in which the Government has a role to play or is it something that we leave entirely up to them as to what they think they need to do to market their products?

**Mr Wood:** At the risk of trivialising the whole debate, one answer is plainly Delia Smith. We should not underestimate the power of an intervention from somebody like that who says, "Eat this, rather than that". In the days when *The Archers* was still used as the frontispiece of the Ministry of Agriculture, we used to do some of those things. Government clearly has a role to play in better health education for the general public. The public will respond to that ultimately and demand different things from their suppliers, and suppliers will be incredibly responsive to that. If Delia can be on television one day and speak in favour of cranberries and Tesco and Sainsbury's can be out of stock two days later, they will respond to that sort of thing, and they will respond to sensible discussion about, for example, sustainable fish stocks. We have watched big supermarket chains move steadily away from unsustainable production when it comes to fish.

**Q391 Lynne Jones:** A bit earlier you were talking about the need to shift from meat and dairy. Are there any other foods that have a high environmental impact?

**Mr Wood:** All food has a high environmental impact but in large part the strength of that goes to how you produce it and you have choices about how you produce it. Foods that demand a lot of fertiliser, a lot of pesticide, have a greater impact than those that do not. I think it might be better to look at it from the other way round and look at foods that have both a lower environmental impact and on which the consensus is that they are better components of a healthy diet. We have grubbed up great tracts of

traditional orchard in this country over the last 30 or 40 years, but traditional orchards (a) provide fruit, which is a key component of a healthy diet, and (b) do wonders for the natural environment in terms of their support for invertebrates and other species. Traditional orchards had a diversity of species within them and we have moved away from traditional English apples and pears into an ever narrowing range of species that we are prepared to eat. Big retailers bear some responsibility for that again. Simply by restoring some of that you could make a difference.

**Q392 Lynne Jones:** What would be the driving forces as regards that and to restore orchards?

**Mr Wood:** Again, incentives could work for that. The current package of incentives does not play particularly well in that area. The changes we are making in 2010 will make a start, but only a start. We could incentivise that much better. The appropriate labelling and promotion of local foodstuffs, which is something we did ten years ago or so, plainly makes a difference. That is something that the state could contribute to rather than the market. Ultimately—and again I go back to Delia—educating people's tastes makes a huge difference.

**Q393 Lynne Jones:** Would that cost? Would people have to pay more for food produced in a more sustainable way?

**Mr Wood:** No, not necessarily. The inputs tend to be less, so you do not have those costs. You might have to incentivise it for a time. Certainly, if we are talking about orchards, apple trees take time to grow.

**Q394 Lynne Jones:** Who would pay for the initial planting?

**Mr Wood:** I have suggested now that agri-environment schemes could conceivably. Certainly if we made the shift from Pillar 1 to Pillar 2 that we advocate, you would have a ready source of funds.

**Q395 David Taylor:** Can we turn, please, to research and development? We have the interesting submission made by Natural England, but in your section "Science, knowledge and technology"<sup>45</sup> at paragraphs 4.6, 4.7 and 4.8 there is no reference to GMs. It is a bit like a discussion of football that does not include Manchester United, or an anthology of great Lancashire Conservatives that does not include the Chairman. That is how to ingratiate yourself in this place! Could you give us the views of Natural England on the use of GMs? It was an odd sort of omission, I thought.

**Mr Wood:** GM potentially has a role to play. We believe that. We believe that GM research in principle is not a bad thing. We believe it carries risks with it and it behoves us to be careful. I need to be careful here because Natural England is a licensing authority for GM releases, so I must not prejudge any particular issue, but with the right precautions GM trials can be made to work. If they can be made to work and robustly demonstrate they have a

<sup>45</sup> Ev 145

18 March 2009 Mr Andrew Wood

contribution to play that does not damage the natural environment, then there is no need to stop that development from going ahead.

**Q396 David Taylor:** You will recall the framework of the whole inquiry was predicated on global food production being increased by 50% before 2030 and being doubled by 2050. Is such a scale of increased volumes possible, do you think, without some contribution from GM?

**Mr Wood:** I challenged earlier the scope—

**Q397 David Taylor:** Did I miss that?

**Mr Wood:**— and I will pass on from that. There is no reason in principle why it should not be possible without GM. Again, if you simply look at the lessons of history, we increased production many-fold through technological advances before anybody had thought of GM. There is no reason why we should not achieve something similar again, but GM is an available technology and used with proper caution could have a part to play.

**Q398 David Taylor:** In the final paragraph of your section “Science, knowledge and technology” you talk about opportunities to develop our knowledge of smaller scale agricultural systems. Are you suggesting that the research at that level at the moment has been inadequate or not received sufficient priority either here or elsewhere?

**Mr Wood:** Yes. We know what we know on the basis of the small-scale pieces of research on particular sites, particular systems. No one has looked across the piece to see what contribution this could make on a much larger scale and we badly need to do that.

**Q399 David Taylor:** How can our government or governments, working collectively, perhaps through the EU, encourage and catalyse such research? If it has not happened naturally in recent years to the extent that you feel is necessary, how can it happen? It is not just a matter of throwing money at it, is it?

**Mr Wood:** Government here plainly has leverage on the research councils and it should use it. Bodies like Natural England, but not only us, exist at least on the edges of the scientific community. My colleague, our Chief Scientist, exists in the middle of them, and we should certainly bring influence to bear. Ultimately, where private sector drivers will not deliver this, government’s role is to step in. We create and support governments, largely for reasons of security, and if we believe that food security is an issue then government plainly has a part to play. Our research funding in those areas we still fund publicly has gone down progressively over many years now, and there is no reason why we should not step into this space. If you look simply at the money that Defra spends currently on R&D, which is about £22 million in the current year, there is no reason why some of that should not be redirected towards this sort of issue.

**Q400 David Taylor:** You are Natural England, but there will be parallel organisations, Natural Netherlands and Natural Namibia and wherever

worldwide. I presume that from time to time you look at how sister organisations elsewhere operate and try to deliver on the terms of reference that you have. Have you found anywhere in any of those nations that you or colleagues have examined which has successfully encouraged investment in small-scale food production on a significant scale without application of large amounts of finance?

**Mr Wood:** Not obviously, no. The best examples, as quite often, are in the Netherlands. It is in the Netherlands where they have pursued most rigorously an integrated approach to this sort of issue, but nobody has invested significantly in this sort of research.

**David Taylor:** Thank you very much, Chairman.

**Q401 David Lepper:** When you were talking about GM research and the need for caution and the right framework, does Natural England have a view about the current regulations for field trials? Or is it difficult in view of the fact that you are a licensing body?

**Mr Wood:** We think the current regulations are appropriate.

**David Lepper:** Thank you.

**Q402 Lynne Jones:** You seemed to be implying a little earlier that the Government should step in and encourage more agricultural research. Are you suggesting that Defra should basically grab some of the research councils’ money and direct it in to agricultural research?

**Mr Wood:** They do not have to direct, although they might as a last resort. They should certainly talk to research councils about this sort of agenda. We are, for good and sufficient reasons, obsessed with climate change. The research councils are putting a huge amount of effort into that and I applaud them for doing so, but along the way there are casualties, and this sort of research is one of those. We can certainly encourage but government has money of its own. As I think Peter Kendall said to you, we used to have a plethora of research bodies that were part of government. Very few of those still exist, for all sorts of good reasons, but we can certainly support those that remain better than we do at the moment.

**Q403 Lynne Jones:** You are not necessarily advocating any increase in research budgets, but just redirecting within existing budgets?

**Mr Wood:** We have to get our priorities right first, but if we conclude at that point that we cannot do that without additional funding, then on this issue I would argue, Natural England would argue, that, yes, we should invest more.

**Q404 Chairman:** To follow up on that thought process, in paragraph 4.6 in your evidence you said: “In the UK and Europe we need to facilitate research, development and extension of new farming practices, designs and technologies that can produce food with a lower impact on the environment.”<sup>46</sup> Is

<sup>46</sup> Ev 145

18 March 2009 Mr Andrew Wood

that a statement of: “This is what we would like the money to be spent on but we do not have any ideas or particular lines of thinking”, or is it informed by, “We have seen one or two things that we think are rather attractive and we would like to see them worked up”? What informed that paragraph?

**Mr Wood:** What informs that is a belief that we have inadequate research resources now; that we see interesting ideas and potential solutions which could be pursued but are not being because of lack of resources.

**Q405 Chairman:** Can you be a little more specific? Is there something which you have seen just over the horizon that inspires you to think, “If they only spent some money on that we could have our cake and eat it”?

**Mr Wood:** I would be happy to be more specific in writing, if I may, Chairman.

**Q406 Lynne Jones:** If you are saying that we should spend more on agriculture within the same budget, what would you spend less on?

**Mr Wood:** I think you would have to look at the research programmes in detail. I think there are difficult choices to be made. I am afraid I have not brought a shopping list.

**Chairman:** Mr Wood, thank you very much indeed for answering our questions and agreeing to supply us with some further information in writing. Thank you again for the written evidence that you have sent in and for coming today to give us oral evidence.

### Supplementary memorandum submitted by Natural England (SFS 63a)

#### 1. CONTEXT

1.1 This further evidence is presented within the context of food and environmental security given in our original submission to the Committee. In the submission we stated that, in our view, the current problems of food insecurity in the UK are concentrated at the household level and relate to dietary patterns and nutritional security, rather than an absolute shortage of food or chronic problems with supply.

1.2 In the long term, however, we cannot guarantee such a secure food supply given a number of underlying factors such as climate change, population growth, and the depletion of oil. We therefore need to develop strategies to ensure the UK’s food security whilst protecting and enhancing our natural environment.

1.3 As well as more sustainable food production, we believe nations should seek to avoid and lessen the projected increase in demand for food as far as possible, through encouraging more sustainable consumption and diets and less waste in supply chains and by households.

#### 2. INTERRELATIONSHIP BETWEEN FOOD PRODUCTION AND THE NATURAL ENVIRONMENT

2.1 The natural environment provides a diverse range of edible plants and animal species that have been and continue to be used as food. About 7,000 species of plants and several hundred species of animals have been eaten by humans at one time or another. Today, however, only 15 plant species and eight animal species are relied upon for 90% of all human food.<sup>47</sup>

2.2 Many key ecosystem services provided by the natural environment are necessary to sustain agricultural productivity, such as the “regulating” services of water purification and nutrient cycling. Agriculture is also reliant on the services provided by biodiversity: a familiar example being the pollination services provided by bees, valued at an estimated £200 million to UK agriculture.<sup>48</sup>

2.3 Biodiversity can also provide a pest regulatory function in agricultural systems by supporting predator species which suppress populations of pest species, for example, hoverflies and ladybirds regulating aphid numbers in a crop. In less intensive systems, it is possible therefore for these species to have an agronomic value by being part of an ecosystem that suppresses pests and diseases.

2.4 In more intensive agricultural systems, the use of agro-chemicals to perform this function has an impact on both the target species and the natural predator species, either directly or through reduced food availability. Biodiversity can also be in direct competition with production, through competition for resources such as sunlight, nutrients, and space. It will therefore be affected by more intensive production, even if the production is much “cleaner” in terms of less pollutants.

2.5 Although we currently have no models for predicting the likely impacts on biodiversity of further intensification in food production, over the last fifty years the increases in agricultural yields have been accompanied by a reduction in farmland biodiversity.

<sup>47</sup> United Nations Convention on Biological Diversity. *Agricultural Biodiversity: Introduction*. UN, 2005.

<sup>48</sup> NAO, *The Health of Livestock and Honeybees in England*, National Audit Office, 2009.

2.6 We note the Government Office for Science's recent report which concludes the UK production of wheat and oilseed rape could potentially be increased by 41% and 55% respectively over the next five or so years, but that this would cause adverse environmental effects, particularly increasing greenhouse gas emissions and decreasing biodiversity.<sup>49</sup>

2.7 Hence while some aspects of increased food production are compatible with a healthy natural environment (e.g. the reduced diffuse pollution benefits provided by precision farming), some practices for controlling pests and the competition for sunlight, nutrients, and land can create trade-offs between maximising production and maintaining biodiversity.

### 3. PRIORITIES FOR RESEARCH AND DEVELOPMENT

3.1 In our original written submission we stated that we need to facilitate research, development and extension of new farming practices, designs and technologies that can produce food with a lower impact on the environment, such as improved husbandry techniques, better timing and accuracy of input applications, and development of crop varieties and management systems.

3.2 In developing countries, failed crops at a local level can be a cause of hunger and malnutrition. In situations where crop yields are extremely low and contributing to hunger, there is an obvious need to increase yields. In countries where yields are currently high, the research and development priority should be to find ways to lower environmental impacts while maintaining productivity.

3.3 It has been estimated that over the next 25 years average global wheat yields will need to increase from 2.6 to 3.5 tonnes per hectare to feed a growing population.<sup>50</sup> In 2007, average wheat yields in the UK were 7.2 tonnes per ha.<sup>51</sup> Although further yield increases might be possible in the UK, (the Government's chief scientist, John Beddington, has indicated wheat yields of 13 t/ha may be achievable by 2050),<sup>52</sup> there are likely to be more opportunities for increasing production sustainably in countries where agricultural yields are currently lower, many of which are expected to experience the projected increases in populations.

3.4 As we note above, it will be difficult to increase yields significantly in intensive farming systems without creating adverse impacts on the natural environment. A key challenge will therefore be to maintain or increase food production while at the same time maintaining or increasing the resources available to non-crop biodiversity in and around fields. A certain degree of "inefficiency" in agricultural systems is in fact desirable to support this biodiversity. In addition, our ability to protect the natural environment outside of agricultural fields may improve, such as with improvement in the management of field margins and reductions in diffuse pollution benefiting aquatic species in rivers.

3.5 To maintain or increase food production and lower environmental impacts, the development and use of different crop varieties will be important. The full breadth of technological approaches needs to be explored, with a full appreciation of the likely benefits, costs and risks of different technologies taken into account. The maintenance of plant genetic diversity is essential in terms of allowing the flexibility to adapt to changing conditions and providing resilience to environmental challenges. Likewise, it is important for technological approaches to be innately flexible and adaptable to a variety of situations, users and environmental conditions.

3.6 As well as improvement in plant varieties, we also need research and development of practices and techniques in the way crops and livestock are managed—including cultivations, rotations, animal husbandry, soil conservation, nutrient management, pest control and energy use. Furthermore, we need to increase our knowledge of smaller scale, highly productive polycultural systems designed around ecological principles. Although these systems are not always commercially viable at present, they may become so in the future if and when circumstances change.

3.7 Below we describe some of the practices, systems, designs and technologies which we believe have the potential for increasing or maintaining production whilst lowering environmental impacts, and which should therefore be considered as priorities for agricultural research, development and extension.

#### 3.8 *Agro-ecological systems*

- Active design of integrated systems following ecological principles. Various methods of design such as zoning, mapping resource flows, etc. Aims to replicate forms and functions of local ecosystems.

<sup>49</sup> *The potential to increase productivity of wheat and oilseed rape in the UK*, GOS, March 2009.

<sup>50</sup> Ortiz *et al.* *Climate Change: Can wheat beat the heat?* Agriculture, Ecosystems & Environment 126 (2008) 45–58.

<sup>51</sup> Defra (2008) *Agriculture in the United Kingdom 2007*.

<sup>52</sup> Evidence submitted to the EFRA enquiry on food supplies.

- Use and encouragement of plant-animal relationships, with symbiotic relationships (e.g. plant foliage as feed for animals which supply manure as fertilizers to plants).
- Use of many of the below practices and techniques in systems (e.g. integrated pest management, organic practices and techniques, etc).
- Small “plot” sizes and spatially complex interrelationships between multiple crops making it difficult for crop specific pests and diseases to establish high population levels.
- Identification of most suitable crops according to natural characteristics of area, chosen for good disease resistance, and which exhibit similar characteristics to wild cousins (and are therefore better able to exist without interventions).
- Active creation of “edge effects” and micro-climates to enable better growth and yields, through various approaches, e.g. wind breaks to slow wind and reduce evaporation.
- Continuous cover cropping and perennial plants favoured to reduce need for disturbance of soils, effort in cultivation, and to utilise vertical space and available solar energy.
- Spatial and temporal annidation (i.e. production of more than one crop in the same space, e.g. intercropping/stacking, and production of more than one crop at different times of year, e.g. crop rotations).

### 3.9 *Aquaculture*

- Choice of appropriate aquatic and/or marine species, e.g. indigenous to area, requiring no/fewer external inputs (e.g. fish meal for predatory species).
- Production with a high degree of integration with local ecosystems and low stocking densities to avoid disease.
- Use of other plants or animals to utilise and assimilate “wastes” from system.

### 3.10 *Organic agriculture*

- Ecological approach encouraged. Employs many of the practices and techniques described above and below, such as crop rotations, green manures, and biological pest management.
- Use of clovers and other legumes to fix nitrogen, mulches used to control weeds, selection of plant breeds for disease resistance, etc.
- Generally lower stocking densities of animals and high welfare standards.

### 3.11 *Hydrology and Integrated Water Management*

- Mapping of water courses and flows within a farm, good ditch management, and control of livestock to watercourses.
- Assessing and planning for water needs, identifying best times for application, monitoring and repairing leaks.
- Investment in water storage capabilities, such as ponds, and rain harvesting systems, utilising large roof areas on farm buildings.
- Use of “terra forming” to retain water in system, e.g. swales, and cultivations along the contours of fields.
- Extraction for irrigation below the replenishment rate of aquifers and water efficient irrigation systems.

### 3.12 *Integrated Pest Management*

- Selection of crop varieties for pest resistance, crop rotations, and timing of cultivations, identification and monitoring.
- Control of pests through the use of natural predators and parasites, reducing or avoiding the need for pesticides.
- Control of weeds using mulches, membranes, rotations, etc.
- Responsible, safe, and minimal use of pesticides, correct selection, application and timing, etc.
- Development of “biopesticides” and other biological controls.

### 3.13 *Crop management and cultivations*

- Crop rotations to improve fertility and nutrient replenishment (e.g. beans before wheat) or improve soil structure, control perennial weeds, etc.
- Intercropping where two or more varieties of crops are grown alongside each other, potentially with synergies (e.g. alliums deterring pests from carrots).
- Undersowing of crops with other plants to suppress weeds, protect soils, and used as green manures.
- Minimum tillage to protect soils from erosion, and benefit soil organisms.
- Cultivating along the contours of fields, to slow water runoff and allow better infiltration.

### 3.14 *Integrated Soil Management*

- Good knowledge of soils, crop management, cultivations, and nutrient management.
- Improving organic matter content to improve soil structure, enable better moisture retention (will improve resilience to drought), and sequester carbon.
- Improving soil structure to allow beneficial soil organisms to function (through sub-soiling, soil lifting, soil conditioners, biological activity (worms), etc).
- Structures and management to avoid soil erosion, such as perennial plantings (grasses, hedges, trees) around cultivated areas or along contours to stabilise soils, use of cover crops, etc.

### 3.15 *Integrated Nutrient Management*

- Assessing and calculating nutrient needs and availability from manures, etc.
- Utilisation of available organic fertilizers, such as composts, manures, and nitrogen fixing plants.
- Soil testing and mapping to identify areas requiring more/less fertilizers and precision techniques to allow more accurate delivery of nutrients.
- Application of fertilizers timed to coincide with plant need, correct calibration of equipment, etc.
- Encouragement of mycorrhizal associations, so that plants can thrive at lower soil nutrient and soil water availability.

### 3.16 *Integrated Livestock Management*

- Stocking densities and timings which avoid over and under-grazing.
- Good grassland management to encourage dense swards to avoid poaching, sequester carbon, etc.
- Use of agricultural wastes, byproducts and other resources as feed.
- Timely stock movements, good access, tracks and pathways, shelter, location or use of feeders and watering points, etc.
- Use of manures as part of Integrated Nutrient Management.

### 3.17 *Animal breeding and management*

- Breeding and alteration of environmental factors to improve conversion ratios, including gene mapping, parentage testing, etc.
- Choice of breed appropriate for production system and climatic conditions, e.g. hardier breeds for out wintering, uplands, etc.
- Good husbandry and welfare to reduce mortality rates of animals.

### 3.18 *Plant breeding and genetic modification*

- Breeding and engineering of gene-products, bioactive molecules, crop germplasm, etc. to develop plants with desirable characteristics, such as:
  - over-expressing certain genes that allow roots to absorb more nitrogen, thus allowing crops to produce the same yield with less nitrogen fertilizer;
  - perennial versions of commonly cultivated annuals, and development of drought and salt tolerant crops; and
  - improved resistance of crops to biotic stresses, such as weeds and pests, through building internal defences.

### 3.19 *Other technology and machinery*

- Appropriate choice of machinery and equipment (e.g. implements for cultivation,) to undertake tasks effectively and reduce environmental risks.
- Computer modelling and satellite navigation to allow accurate sowing and harvesting of crops.

## 4. YIELDS OF DIFFERENT AGRICULTURAL SYSTEMS AND PRACTICES

4.1 Research centres and institutions throughout the world have undertaken or have ongoing crop trials, comparing yields of different varieties, under different environmental conditions, with different amounts of inputs, or managed with different production techniques. There is also a significant amount of privately funded research into animal genetics, genetic modification and conventional plant breeding.

4.2 A number of trials have sought to make comparisons between systems, either between organic and conventional systems or comparing conventional, integrated, and organic systems. Some studies have measured yields from particular agricultural practices such as intercropping, urban and peri-urban horticultural production, and agro-forestry experiments.



4.3 The comparison of farming systems, including yields, can however be highly problematic, even in situations where the results are unlikely to be controversial. Problems arise due to definitions (particularly of the different agricultural systems), the objectives and design of studies, time periods, methods and standards used for comparison, and the need to isolate factors which affect performance but are not related to the system.

4.4 Despite these problems, a number of studies do provide indicators as to the effects of different systems on yield.

4.5 A long term comparative study of organic and conventional crop yields on nutrient depleted soils in Sweden showed conventional crop yields were significantly in excess of organic yields, although the difference was much less for grass/clover than for all crops in the rotation. *Comparison of Long-Term Organic and Conventional Crop-Livestock Systems on a Previously Nutrient Depleted Soil in Sweden* Holger Kirchmanna,\*, Lars Bergströma, Thomas Kätterera, Lennart Mattssona and Sven Gessleinb a *Dep. of Soil Science, Swedish Univ of Agricultural Sciences, 2006.*

AVERAGE CROP YIELDS ( $\pm$  SE) DURING THE PERIOD 1981–98

Type of system	Mean dry matter yield			
	All crops in the 6-yr rotation cycle†	Barley	Winter wheat	Grass/clover‡
	kg ha <sup>-1</sup>			
Conventional	6380 $\pm$ 755a §	3745 $\pm$ 650a	6075 $\pm$ 524a	7480 $\pm$ 755a
Organic	3170 $\pm$ 436b	2105 $\pm$ 176b	4200 $\pm$ 544b	6140 $\pm$ 146a
Control	2080 $\pm$ 336c	1119 $\pm$ 75c	3680 $\pm$ 644c	not grown

† Column refers to all six crops in rotation incl. winter oil seed rape, sugarbeet and oats in the conventional and beans, peas and potatoes in the organic system.

‡ Grass/clover includes weeds.

§ Within columns, mean values followed by different letters are significantly different at  $P < 0.05$ .

4.6 A different result was identified by another long-term study, comparing four farming systems that differ in crop rotation design and material input use: a 2-year and a 4-year rotation conventional system, an organic and a low-input system. Results from the first eight years of the project show that the organic and low-input systems had yields comparable to the conventional systems in all crops which were tested—tomato, safflower, corn and bean. *Clark S, et al 1999a. Crop-yield and economic comparisons of organic, low-input, and conventional farming systems in California's Sacramento Valley. American Journal of Alternative Agriculture v 14 (3 Sustainable Agriculture Farming Systems project (SFAS) at UC, Davis.*

4.7 One of the longest running agricultural trials on record (more than 150 years) is the Broadbalk experiment at the Rothamsted. The trials compare a manure based fertilizer farming system (not certified organic) to a synthetic chemical fertilizer farming system. Wheat yields are shown to be on average slightly higher in the organically fertilized plots (3.45 tonnes/hectare) than the plots receiving chemical fertilizers (3.40 tonnes/hectare). Soil fertility, measured as soil organic matter and nitrogen levels, increased by 120% over 150 years in the organic plots, compared with 20% increase in chemically fertilized plots. *Jenkinson, D. S. et al, 1994. In Long-term experiments in Agricultural and Ecological Sciences (eds Leigh, R A & Johnston, A E) p 117–138 (CAB Int. Wallingford, U.K. 1994).*

4.8 A review of European data on organic yields concluded:

- Organic cereal yields are typically 60–70% of those under conventional management.
- For most countries, studies show a high variation in both the absolute and relative yields of potatoes.
- Organic vegetable yields are often as high as under conventional management, but it is difficult to draw general conclusions due to the high diversity of different vegetables.
- Little data is available on pasture and grassland yields in organic farming reported values lie in the range of 70–100% of conventional yields, depending on the intensity of use.
- In livestock production, performances per head are quite similar to those in conventional farming. But due to lower stocking rates on organic farms, yields per hectare are lower.

*Economic Performance of Organic Farms in Europe.* Offermann and Nieberg. 2000.

4.9 The effect on yields of intercropping at various densities has been studied. In field trials in 1987–88, wheat and field beans were grown as sole crops and additive intercrops. The intercrops consisted of all density combinations of wheat and beans from 25 to 100%. Crops of 50:50 winter wheat and field beans were

shown to require 30–50% less land to obtain the same yield to when the crops are grown separately. *Effects of plant density on intercropped wheat and field beans in an organic farming system* H. A. J. Bulson, R. W. Snaydon and C. E. Stopes Agricultural Botany Department, University of Reading.

4.10 A study of urban and peri urban agriculture calculated that horticultural species, as opposed to other food crops, can provide up to 50 kg of fresh produce per m<sup>2</sup> per year depending upon the system employed. The report also states that urban producers achieve efficiencies in production by making use of under-utilized resources, such as vacant land, treated wastewater and recycled waste and unemployed labour. It estimates that productivity can be as much as 15 times the output per hectare of rural agriculture. *Urban and Peri-urban Agriculture: report presented to the FAO Committee on Agriculture (COAG) meeting in Rome 25/26 January 1999.*

April 2009

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**Monday 30 March 2009**

Members present

Mr Michael Jack, in the Chair

David Drew  
Mr James Gray  
Lynne Jones

David Lepper  
Paddy Tipping

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**Memorandum submitted by The Soil Association (SFS 47)**

EXECUTIVE SUMMARY

*How robust is the current UK food system?*

Superficially—in reality, not “fit” for future shocks & challenges.

Achieving agreed 80% cuts in greenhouse gas emissions and contending with depleting oil requires radical transformation of UK farming and food systems.

*Government has excessive, unfounded faith in “global markets”*

Dominant methods of food production, distribution and retailing in the UK, and in countries from which UK imports food: “not fit for a low-carbon, more resource-constrained future.”

*UK and European soils are under stress*

Healthy soil is the foundation of any Nation’s true food security. Humanity has forgotten this simple fact. Soil erosion and degradation affect some 157 million hectares, 16% of Europe.

*Lack of labour*

Lower-carbon farming systems will require more people working in food production.

*Inconsistencies re: agriculture, health and climate change policies*

Public urged to eat more fruit and vegetables, yet UK production declined—over 90% of fruit eaten here imported.

*Public R&D misdirected*

Government is failing to provide R&D funding for the “agroecological approaches” and “the improved techniques for organic and low-input systems” identified by scientific consensus.

*Foundations of a more resilient food and farming system remain in place (just)*

More localised food systems are key to enhancing the resilience of the UK’s food security, regenerating rural economies and providing new routes to market for farmers.

*Help consumers choose climate-friendly food*

With 30% of individual’s carbon foot-print coming from their food, being able to choose “climate-friendly” food—just as they can fridges, washing machines, cars and light-bulbs—offers an easy, everyday action for consumers.

*A Food Plan for Britain needed*

Lack of official strategic direction as to best mix of food types and farming systems for delivering sustainable UK food security.

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 INTRODUCTION

1.0 The Soil Association congratulates the Committee on choosing such a pertinent issue. The security and sustainability of UK and global food production and farming have been primary concerns of the Soil Association since its foundation 63 years ago.

1.1 We examined the current situation in our report, *An inconvenient truth about food—neither secure, nor resilient*, published November 2008 and already made available to Committee members.

1.2 We are pleased to provide an updated summary of our concerns, indicating possible policy measures and practical solutions as appropriate.

*How robust is the current UK food system?*

2.0 Superficially: Supermarket shelves are stacked high with a wide variety of foodstuffs and few people go hungry. Quite the opposite—with 40% of Britons predicted to be obese by 2025; 70% of girls and 55% of boys overweight or obese by 2050.

2.1 Whilst global rises in food prices, with consequent “food riots” over cost and scarcities, have occurred in 14 countries, Defra does not appear concerned that any of the underlying causes affect the long-term security and sustainability of UK food supplies. The language is less dismissive than a few years ago, but the Government’s view remains broadly the same,

*“...because the UK is a developed economy, we are able to access the food we need on the global market.”<sup>1</sup>*

In the brief period since that statement was published, the world has changed dramatically as global financial markets have collapsed. There are strong indications that the global food market, on which Government places so much reliance, is no more stable.

2.2 The Soil Association shares the conclusions drawn in the first version of the Cabinet Office Strategy Unit analysis of food issues:

*“...existing patterns of food production are not fit for a low-carbon, more resource-constrained future”. And “...existing patterns of food consumption will result in our society being loaded with a heavy burden of obesity and diet-related ill health.”<sup>2</sup>*

Those unequivocal statements were air-brushed out of the final report. The Strategy Unit’s original more critical analysis of UK food security has not been a key policy influence.

2.3 The Department of Health urges the public to eat more fruit and vegetables—yet indigenous fruit and veg production has declined—with over 90% of fruit eaten here being imported. Enabling farmers to grow more of the food types highlighted in national and WHO dietary guidelines would improve people’s health (see obesity stats above) and encourage production of lower carbon food— less, better-quality meat from grass-fed beef and sheep; wider range of cereals for direct human consumption; more root crops, fresh fruit and veg.

*What are the current UK food system’s main strengths and weaknesses?*

3.0 Most methods of food production, distribution and retailing in the UK, and in countries upon which the UK relies for imports of human food and feed for livestock production are inherently unsustainable—as the Strategy Unit concluded, *“not fit for a low-carbon, more resource-constrained future.”*

3.1 The Inquiry’s terms of reference emphasise sustainability as a key factor in food security, but do not sufficiently set this in the overarching context of climate change and the longer-term inevitability of scarcer, costlier oil. The Government target of 80% cuts in UK greenhouse gas emissions by 2050, on the recommendation of the Committee on Climate Change, includes nitrous oxide and methane—for which agriculture is the main source:

- Nitrous oxide being the biggest portion: The Scottish Executive calculated that artificial nitrogen fertilisers made up 57% of Scotland’s total nitrous oxide emissions, contributing 6.5–7% of the country’s overall greenhouse gas emissions.<sup>3</sup>
- Manufacturing and delivering 1 tonne of nitrogen fertiliser uses 1 tonne of oil, 108 tonnes of water, giving off 7 tonnes of carbon dioxide in the process.<sup>4</sup>

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<sup>1</sup> Ensuring the UK’s Food Security in a Changing World, Defra 2008.

<sup>2</sup> Food: An analysis of the issues, Cabinet Office discussion paper, January 2008.

<sup>3</sup> Scottish Executive (2004), Scottish Agriculture and Global Change—Nitrous Oxide Emissions from Fertiliser Use. Environment Group Research Report 2004/09.

<sup>4</sup> NF0614 Environmental Assessment Tools for Biomaterials, North Energy Associates, Springdale Crop Synergies, 2007.

- Overall food and farming (excluding soil carbon loss) make up c.18% of the UK's total greenhouse gas emissions.

### *European agriculture no different*

3.2 Defra dismisses concerns over the UK's dependence on imports for 40–50% of our food needs, on the basis that 68% of these come from “low-risk, stable trading partners” within the EU.<sup>5</sup> Yet food production across the developed world is predominantly dependent on vast amounts of finite, fossil-fuel derived inputs:

- Industrial food production uses 10 calories of fossil-fuel energy to produce a single calorie of food energy.
- Food and drink make up 31% of the global warming potential generated across all goods & product categories in the EU.

3.3 “Decarbonising” agriculture is key to our long-term food security. That requires reducing reliance on fossil-fuel based, greenhouse-gas generating artificial fertilisers and moving rapidly to modern rotational and mixed-farming supported by the best science.

3.4 With one-third of each European citizen's carbon footprint coming from what they choose to eat and drink, helping consumers make easy, low-carbon food choices is crucial—and enabling farmers to produce such foodstuffs.<sup>6</sup>

3.5 A life-cycle analysis in 2003 of the Swedish food-chain from farm inputs through to home preparation showed the best way to reduce the energy inputs and greenhouse gas emissions embedded in people's food was to shift to a diet of less meat and cheese, more in-season vegetables, locally produced and fresh foods.<sup>7</sup>

### *Loss of Labour, Lack of Skills*

3.6 Lower-carbon farming systems will require more rather than fewer people working in food production. An indication of how many is offered by Cuba's experience. Following the collapse of the Soviet Union in 1991 and with it imports of Soviet oil, fertilisers and pesticides, Cuba had to deploy some 15–24% of its population into growing food.

3.7 The number of people working on the land has been in decline since the Agricultural Revolution—although 40% of the population were still employed in farming in 1900; falling to 15% by the start of World War Two. Today less than 2% work in agriculture.

3.8 Despite this exodus, the foundations of a more resilient, stable food and farming system remain in place (just)—with some encouraging “green shoots of recovery”:

- Around 10,000 mixed-farms (organic and non-organic) remain, providing the basis for more sustainable, lower-carbon forms of farming relying on crop and livestock rotations to build fertility, rather than oil and chemicals.
- As the number of farms and farm labour has declined, so has the infrastructure needed for more resilient, localised food and farming economies. 1000 independent butchers, greengrocers, bakers etc. closed every year during the 1990s and the number of UK abattoirs fell from 3,000 at the end of the Second World War to under 300 today. But the last decade has seen some resurgence: over 550 farmers' markets provide fresh, local, seasonal produce to consumers and enable farmers to get more of the “Food £”.

3.9 Employment figures for organic farming offer a model for the likely labour requirements of a lower-carbon farming system: Based on actual comparative, farm data, the University of Essex found that organic farms provided 32% more jobs per farm than equivalent non-organic farms. If all UK farming went organic 93,000 new jobs would be created, ten times the number of jobs lost from the closure of rural post offices over the past 15 years.

<sup>5</sup> Ensuring the UK's Food Security in a Changing World, Defra 2008

<sup>6</sup> Environmental Impacts of Products (EIPRO): Analysis of life-cycle environmental impacts related to the total fuel consumption of the EU25, European Science & Technology Observatory & Institute for Prospective Technological Studies, April 2005

<sup>7</sup> “Food and life cycle energy inputs: consequences of diet and ways to increase efficiency”, *Ecological economics*, 44, 2–3, 293–307, 2003

3.10 Against the trend of an aging farming sector (average age of British farmer = 56), organic farmers are seven years younger; a higher proportion are new-entrants, and three-times as many are involved in direct or local marketing than their non-organic counterparts.<sup>8</sup>

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

4.0 The conclusion that we need to “double food production by 2050” is too narrowly focused. The world produces enough food to feed everyone on the planet—WHO states that 2200–2500 calories are needed per day to sustain an individual in productive health. Globally more than sufficient calories are produced—whilst nearly 1 billion people are malnourished in the South; 2 billion are clinically overweight in the North. The issue, the UN and the UK should address is not simply the volume of food grown, but what types of food, destined for what end uses?

- One-third of the UK and global grain harvest goes to feed animals—mainly as concentrates for intensive livestock units. These are inefficient converters of plant energy to meat for human consumption, taking 10 kilograms of feed to produce 1 kilogram of beef; 4–4.5 kilograms for each kilo of pork.
- 70% of all EU livestock feed is imported, underlining the inherent unsustainability of intensive meat production—and its vulnerability should developing countries decide to grow food to feed their own people rather than our livestock.
- More morally questionable is the diversion of grains to feed not humans, however indirectly, but cars. In 2006, the US turned 20% of its corn harvest into biofuel, taking millions of tons of maize (and wheat) off the world market.

4.1 On climate change, human health and food security grounds, the UK would be better off if we reduced our overall consumption of meat, relying more on extensively-grazed livestock than those raised in intensive units, dependent on imported feed.

4.2 The healthier, low-carbon diet as outlined in paragraph 2.3 above could be delivered through a wholesale shift to organic farming and in sufficient quantities to feed the UK population according to independent research by the University of Reading.<sup>9</sup>

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

#### *Soil quality*

5.0 The UK and EU countries are not suffering from soil degradation and erosion to the degree suffered in more arid regions, such as sub-Saharan Africa or from salinity caused by inappropriate farming techniques as in parts of China, the former Soviet Union and Australia. The UN’s Environment Programme estimates half of the world’s arable land will be “unusable” by 2050 (reason to prioritise care of our own farmland). But UK and European soils are under stress: erosion and degradation affect 157 million hectares, 16% of Europe. The Environment Agency estimated that 2.3 million tonnes of UK soil were lost over 1995–8, mainly due to intensive farming practices.

5.1 A key indicator of soil quality is organic matter levels. Over 30 years ago the “Strutt report” concluded that, “some soils are now suffering from dangerously low organic matter levels and could not be expected to sustain the farming systems which have been imposed on them.”<sup>10</sup> “Organic matter” means crop residues like straw, the root masses of previous crops, naturally deposited and mechanically-spread manures, as well as the myriad organisms from microbes to earthworms that inhabit a healthy soil—the building blocks of healthy, resilient soil structure and fertility. The most recent data from the National Soil Inventory shows that organic matter levels have continued to fall: in 1981 22% of our soils contained more than 7% organic matter, by 1995 only 13% did.

5.2 Less organic matter means less carbon storage. According to the National Soil Resources Institute, UK soils are losing carbon “on an enormous scale”, around 13 million tonnes annually—almost as much as from all other agricultural sources (14 million tons).

<sup>8</sup> Organic works, providing more jobs through organic farming and local food supply, Soil Association, University of Essex, 2006

<sup>9</sup> England and Wales under Organic Agriculture: How much food could be produced? Centre for Agricultural Strategy, University of Reading, 2008

<sup>10</sup> Strutt Report “Modern farming and the soil”, published 1970, MAFF

5.3 Healthy soil is the foundation of any Nation's true food security. Soil husbandry needs to be made a paramount priority, with farmers given incentives to increase organic matter and the soil's capacity to store carbon. Good soil management should be rewarded through the Single Farm Payment scheme.

#### *Water availability*

6.0 Agriculture is the greatest user of water globally, accounting for 70% of water use. Under climate change, the UK is predicted to experience hotter, drier summers with rainfall declining by up to 50% in the south and east of the country by the 2080s; along with warmer, wetter winters, characterised by sudden, heavy downpours. Parched, poorly structured soils are less able to absorb and store water.

6.1 Countries suffering greater water-stress than the UK will increasingly limit the quantity of "embedded" water they are exporting along with cash crops. Around 12% of the UK's fruit and vegetable imports come from Africa. Annual imports of green beans alone bring in 189 million cubic metres of virtual water—each bean stem taking four litres.

#### *The marine environment*

7.0 The UN's Food & Agriculture Organisation estimate 75% of the world's fish stocks are fully exploited, over-exploited or depleted. For the UK, it was estimated that half of the fish landed in 2004 came from sources that were unsustainable or borderline.<sup>11</sup>

7.1 In response, fish-farming has become the fastest growing animal-food producing sector, making up 30% of fish consumed. Mainstream fish-farming relies on fishmeal made from small, wild fish—not eaten by humans, but the food source for myriad marine species. Apart from impacts on wildlife, fishmeal conversion rates to human-edible fish protein are poor—generally 3–5kg of wild fish to each kilogram of farmed fish produced. Scotland's farmed salmon harvest of 130,000 tonnes in 2001 was produced from 400,000 tonnes of wild-sourced fishmeal.

7.2 Healthy eating guidelines recommend one portion of oily fish weekly—but eating fish in moderation, closer to a serving of oily fish every three weeks would be more sustainable. There is good evidence that milk from organically-raised, grass and clover grazed cows produces significant levels of the key nutrients found in oily fish (omega-3 fatty acids).<sup>12</sup> More research is needed to verify and develop such land-based substitutes, as well as increasing the amount of fishmeal produced from crop plants.

#### *The science base*

8.0 Government is failing to provide sufficient research funding for the "agroecological approaches" and "the improved techniques for organic and low-input systems" that the consensus of international scientists say are needed to curb climate change and deliver food security globally.<sup>13</sup>

8.1 Defra's overall spending on R&D related to organic farming was a mere £1.6 million between 2006 and 2007. Available evidence shows public spending on straight organic farming research has been about £2.2 million per year over 1997 to 2006. In contrast, public spending by the Government on agricultural biotechnology research was at least £49 million between 2006 and 2007 and £50 million between 2005 and 2006. This doesn't include spending via individual grants from the Biotechnology and Biological Sciences Research Council, for which data is not available.<sup>14</sup>

8.2 This bias in the direction of publicly funded research contradicts public preferences as to the food they want to eat. In 2004, when the Government officially asked the public, 86 % said they would not be happy to eat GM foods. By contrast, sales of organic produce rose by 22 % last year. Unlike organic crops, no GM crops are grown commercially in the UK.

8.3 Public research funding should be redirected to:

- Developing modern, mixed-farming systems.
- Decarbonising the food system.
- Delivering and increasing fertility without fertilisers.
- Improving understanding of and productivity from the use of rotations.

<sup>11</sup> Foster C (2005) Fish Consumption and production: The sustainability Challenge. National Consumer Council

<sup>12</sup> Butler *et al* (2008) "Fatty acid and fat-soluble antioxidant concentrations in milk from high and low input conventional and organic systems: seasonal variation", *Journal of the Science of Food and Agriculture J Sci Food Agric* 88:1431–1441.

K. A. Ellis, G. Innocent, D. Grove-White, P. Cripps, W. G. McLean, C. V. Howard and M. Mihm (2006) Comparing the Fatty Acid Composition of Organic and Conventional Milk, *J. Dairy Sci.* 89:1938–1950.

Dewhurst R J, Fisher W J, Tweed J K S and Wilkins R J (2003). Comparison of grass and legume silages for milk production. 1. Production responses with different levels of concentrate. *Journal of Dairy Science*, 86:2598–2611.

<sup>13</sup> International Assessment of Agricultural Science and Technology Development, April 2008.

<sup>14</sup> Planting Prejudice, How UK Government support for GM crops undermines sustainable farming policies, Friends of the Earth, September 2007

- Placing soil science, management of soils for fertility and carbon sequestration at the top of agricultural scientific endeavour.

### *The provision of training*

9.0 “Shedding labour” has been seen as an inevitable and conventional agronomic “efficiency”. But to achieve secure, sustainable food supplies over the next 50 years, we will need more people in agriculture—yet there is a serious shortage of available labour and skills.

9.1 The UK has historically failed to take advantage of EU schemes providing grants to enable young people to set up in farming. As of 2002, across EU Member States the average annual take-up of such schemes stood at 24–31,000 people, with France alone accounting for 40% of the scheme. UK take-up was 0%.

9.2 County Council tenancies traditionally provided a key “first rung on the farming ladder”, but successive Governments have encouraged or forced Councils to dispose of their farming estate. The acreage of council tenancies declined by 7,558 acres, with 202 farms no longer available to tenants over a three-year period between 1999–2002.

9.3 Government should introduce measures to encourage young people to take up a career in food production and support farm labour, as has been done with the teaching profession. The Soil Association runs a modest “Organic Apprenticeship” training scheme providing on-farm work placements and training for young people and new entrants. Funded by the Soil Association and apprentice contributions, this merits support and extension by Government.<sup>15</sup>

### *The way in which land is farmed and managed*

10.0 The statistics cited above show that our current food production system in the main is not sustainable, nor guaranteeing our long-term food security. An accepted definition of food security in the past has been that provided by the United Nations Food & Agriculture Organisation:

*“Food security exists when all people, at all times, have access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life.”<sup>16</sup>*

That 10-year old definition doesn’t adequately reflect the need for food security to be founded above all on sustainable production, given current understanding of the scale and urgency of the challenges brought by climate change.

10.1 UK and global food security must be considered in that context, as has the International Agricultural Assessment of Science, Technology and Development (IAASTD), a global colloquium of over 400 scientists, signed-up to by over 60 governments, including the UK. IAASTD concluded that:

*“...despite significant scientific and technological achievements in our ability to increase agricultural productivity, we have been less attentive to some of the unintended social and environmental consequences of our achievements.*

*Business as usual is no longer an option...Policies that promote sustainable agricultural practices (...) stimulate more technology innovation, such as agroecological approaches and organic farming to alleviate poverty and improve food security.”<sup>17</sup>*

10.2 The “agroecological approaches and organic farming” that IAASTD calls for have been starved of research and development funding (see para 8.1 above). Consequently, sustainable farming systems are in a comparable situation to the renewable energy sector, where the lion’s share of funding was swallowed up by the fossil-fuel and nuclear energy industries, setting renewables back a decade or more. Only when fiscal measures were introduced to stimulate non-fossil fuel energy generation was the necessary investment, innovation and progress made. Similar incentives are needed to drive sustainable and secure food and farming systems.

### *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect?*

11.0 As awareness of climate change and evidence of its impacts increases, more consumers are going to seek ways of reducing their carbon-footprint. With 30% coming from their food, being able to choose “climate-friendly” food—just as they can fridges, washing machines, cars and light-bulbs—offers an easy, everyday action.

<sup>15</sup> [www.soilassociation.org](http://www.soilassociation.org)

<sup>16</sup> Rome Declaration on Food Security, FAO, 1996

<sup>17</sup> IAAST, Global Summary, Options for Action, p. 33, <http://www.agassessment.org>



*What use could be made of local food networks?*

12.0 More localised food systems are key to enhancing the resilience of the UK's food security, as well as regenerating rural economies and providing new routes to market for farmers.

12.1 The Soil Association is the lead partner in the Food for Life Partnership which is working with a core of 180 flagship schools across England to deliver healthier, more sustainable school food and connect children more closely to where their food comes from. Food for Life targets for school food are 75% unprocessed, 50% local and 30% organic. Apart from enabling children to understand and make better food choices, Food for Life schools are dramatically cutting their food miles: Hurlford Primary School in East Ayrshire reduced its food miles by 75%, with average distance traveled per menu food item dropping from 330 to 99 miles.<sup>18</sup>

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

13.0 Produce a "Food Security Plan for Britain": providing strategic thinking as to the best mix of food types and farming systems to deliver national food security whilst meeting the challenges of climate change and longer-term, depleting oil.

13.1 *Lead by example:* as the Dutch Ministry of Agriculture, Defra and all government departments and food procurement contracts which they oversee should specify seasonal, fresh and low-carbon food—encouraging local producers and suppliers to tender as permitted under European law.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

14.0 Insufficient links between food production, public health, and climate change mitigation policies.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

15.0 Simply doubling food production is a crude, inaccurate measure that could drive a return to crude maximised production with minimal human health and environmental restraints.

Criteria would include:

- Reverse damage to UK soils —targets for increasing soil organic matter content.
- Develop accurate measurement for individual farm's soil carbon storage/losses —set annual targets for sustaining/increasing soil carbon storage per farm.
- Annual target cuts in greenhouse gas emissions from agriculture and throughout food-chain (some supermarkets have already calculated and set targets for individual food items carbon budgets).
- Increase proportion of "healthy eating" guidelines foodstuffs grown in UK i.e. currently 90% of fruit consumed in the UK is imported.
- Biodiversity is not an "either/or" when it comes to food security, but a key indicator of the sustainability of the system. We can have "sky-lark friendly daily bread".
- Increases in employment in farming as a positive indicator of lower-carbon farming.

January 2009

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*Witnesses:* **Mr Monty Don**, President of the Soil Association, **Mr Peter Melchett**, Policy Director of the Soil Association and **Mr Robin Maynard**, Campaigns Director, the Soil Association, gave evidence.

**Q407 Chairman:** Good afternoon, ladies and gentlemen. Apologies for the slightly late start to our evidence session of the Committee's inquiry "Securing food supplies up to 2050: the challenges for the UK". I welcome our witnesses this afternoon from the Soil Association in the shape of Monty Don, their President. Mr Don, you are obviously a familiar face to us because of your excellent appearances on the television. We have had great difficulty in restraining the Committee from focusing entirely on our own allotment and gardening questions, but we might want to see you afterwards. Mr Maynard is their campaigns director and Mr Peter Melchett, policy director, who is an old friend of the Committee. In fact, Peter, you were mentioned in despatches last week because the Committee went to Jealott's Hill and they commented that your father had opened the site.

**Mr Melchett:** It was my grandfather.

**Q408 Chairman:** You have honourable credentials in the world of agricultural research and they still talk in fond terms about your family. Moving on, this is a very important subject, the question of food supply to security and how we are going to meet that against a background where some resources like fossil fuels are getting ever more scarce and expensive and you bring your own special perspectives on these matters before the Committee. In your evidence—I thank you for the written update of it—you describe the UK's food system as "superficially robust". It would be interesting to know what you meant by that phrase?<sup>19</sup>

**Mr Don:** The whole food supply structure depends upon certain circumstances and situations which we regard as fragile at best and exposed to a domino effect, not dissimilar to the financial situation that we witness crumbling around. Whether you call that the perfect storm, the domino effect or whatever, we have got oil prices; we have got climate change which obviously is probably the most pressing of all those things; we have literal situations where you have countries controlling supplies of phosphate fertiliser, for example, which are prone to control and supply, not just of price, but of absolute supply, and you have the effect of climate itself. Put all that together and we feel that the infrastructure is very delicate. We saw it with the lorry drivers' strike, we see it with weather, and put all that in one place and our food supply, which most consumers regard as limitless—an endless supply of whatever they want whenever they want—is, at best, fragile and, at worst, unsustainable. It is the sustainability that obviously we are most concerned with; sustainable in supply and in quality.

**Q409 Chairman:** Let's look at the reverse of that. In paragraph 3 of your evidence you reflect on that and you say: "Most methods of food production, distribution and retailing in the UK and in countries upon which the UK relies for imports of human food and feed for livestock are inherently

unsustainable . . ."<sup>20</sup> I suppose the reverse of the previous quote and that is can you put the argument forward that a system based on the organic philosophy would effectively be more stable and more sustainable?

**Mr Don:** I would not be here if I could not say yes to that.

**Q410 Chairman:** I would like you to make the case out as to why you think that is the situation.

**Mr Melchett:** The fundamental argument and, as Monty says, the key pressure we face is climate change and the need to reduce greenhouse gases by something approaching 80%, if not 80% or more, between now and 2050 for the greenhouse gas emissions from food and farming. Organic farming starts with one key advantage that it uses renewable energy—solar energy—to provide the fertility to grow the crops. Organic farming systems use legumes, principally red clover in this country, to fix nitrogen to grow subsequent crops. At my own farm we have two years of red clover which will grow four years of crops before we go back to red clover. We do not need any oil or natural gas to extract nitrogen from the air to allow us to grow the crop, so that is a key element of it. There are lots of other bits of organic farming where we improve the soil organic matter which means that we capture more carbon into the soil, which sequesters the carbon. We have plants which do not require the same input of things like phosphate, as Monty says, the supply of which is certainly not secure and not long term. We build soil, the ultimate resource from which we grow things, so there are many advantages inherent in the system of that sort of farming which make it at least have the potential to be much more sustainable. We do not claim that we have got it right or perfect by a long way.

**Q411 Chairman:** What would your advice be when looking at other non UK major producers who are dependent on a mainstream agricultural approach to production? The criticism you have made about the UK's stability in its supply must, by definition, apply to them as well. Therefore does that suggest a change in approach in the UK in terms of the proportion of food that we produce from within our own resources? In other words, if we follow your philosophy does that QED mean that we ought to try and produce a greater proportion of that which we consume here of all types of food?

**Mr Don:** The simple answer is yes. I do not think there is any attempt or benefit in trying to be 100% self-sufficient. We are a trading nation and we should trade and we want to trade, ideally fair-trade and organic, but we should be producing more of what we can using a sustainable organic system, which by definition means not forcing that production but going with what is possible and that is dictated by climate, geology and so on. I know the Government figures are that we are producing something like 49% of all the food we consume here.

<sup>19</sup> Ev 167

<sup>20</sup> Ev 167

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 30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard
 

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**Mr Maynard:** The figures vary. They say we are about 60% self-sufficient in foodstuffs consumed here but the official figures vary and for the most are based on monetary value rather than on nutrition or calorific value. You see some figures down at 49%. Defra will point out and say that is fine because we import the majority of food from the EU. Your point, Chairman, was that we would suggest that those other countries exporting to the UK are also vulnerable because of the issues of climate change and the reliance on fossil fuels, particularly on fertilisers, as Monty mentioned, both artificial nitrogen with its very heavy greenhouse gas burden and oil use, and also phosphate, which not many people are talking about but it is mostly sourced from North Africa. The pessimistic view is there is 30 years' worth left and the optimist is 60 to 90 years, so there are some vulnerabilities of that global trading system and reliance on it.

**Mr Don:** It is not a question of simply providing an alternative way of doing what we are already doing. What we see as food security and the food future for this country and for the world is reshaping the way we go about it, a different paradigm, if you look at the financial model. It is no good just piecing together what is going wrong and hoping that it will not go wrong again. I really do believe that we have to rethink this in terms of health, in terms of climate change and in terms of production. At the moment they are not being linked. The consumer is not linking it; I do not believe the Government is linking it and I do not think producers, with the best will in the world, and I speak as one and there are a lot of very good farmers, organic and non organic, necessarily linking what they are doing to health and to climate. This must be set in terms of what we need to do in the future rather than how we can just simply change the way we are going to make it a bit more organic. That is not the point. The point is to adapt and change and it is the change that is important.

**Q412 Chairman:** Who, in your opinion, should do the linking together? The food supply chain has been pretty well subcontracted to the private sector—supermarkets, food service companies and food manufacturing companies—they do food and there is nobody sitting in Smith Square in Defra command and control saying send food to here and food to there. That was the old days of the Ministry of Food Production in the Second World War. We are light years away from that. Defra, on the other hand, has re-engaged in food. It has put out consultation documents on this subject. What would your thoughts be as to who is going to hold the ring to achieve the objectives you have just described?

**Mr Don:** I do not have much faith in government doing it because I do not think they have the equipment, neither mental nor material. Maybe they should; maybe they have got to change as well. I think bodies like the Soil Association have a role to play. Personally the way I see it working is to devolve down as near to consumption as possible rather than seeing it as a central government controlling food, as you say, in the wartime way and supplying it. If you

can devolve production and consumption so that they are as close together as possible, and the obvious example of that are farmers' markets or farm gate sales, that is a healthy, very flexible way of supply and demand.

**Q413 Chairman:** I do not disagree with what you have said. I can understand where you are coming from but if you look at where we are at the moment, 75%, possibly even up to 80% of the domestic food that is consumed comes via supermarkets and to get to the model that you have just described would be a colossal change in the consumption of buying habits. What I am interested in is not so much the statement of where is the endgame, which is a smaller localised model that you have just described, but it is the process of transition from where we are to what is practically achievable at a smaller level. In other words, how if you were going to see Mr Tesco or Mr Sainsbury would you convince them that there was a new way of doing business to be engineered, because they are not going to say we are going out of business next week and we are going strictly local.

**Mr Don:** I agree. Part of the problem with creating any new model is that the existing one is not going to welcome it and a lot of it is not going to adapt. There are two things: Peter can answer in terms of production but in terms of the consumer, all my experience of the consumer is that they have no relationship to production at all. Most of them have absolutely no idea of where their food comes from; the level of ignorance is staggering. At government level that should be rectified today. It is of vital importance to educate and inform people. The Soil Association has a project with schools to do precisely that but it needs much more. The process of growing a pot of chives on a windowsill is actually a huge leap in connecting people to the food that they eat because any connection to production is going to link to consumption of what you eat. I would say, for example, that every new house should have a garden or an allotment. We should be encouraging people to produce on a very local level, not to stop them going to Tesco, to connect.

**Q414 Chairman:** It is very easy to take off on a flight of fancy.

**Mr Don:** No, that is practical, not fancy.

**Q415 Chairman:** So often people who come before the Committee, for example, if we are talking about energy efficiency, immediately start talking about new houses, but they forget all the ones that are already there and those are the more difficult ones to deal with. Coming back to my question, where are we where we are. What is the model to get from where we are to where you want to be? The question I posed about the role of Defra and you said no, we do not want to do that; we want to get down to a much more local level where the food consumer can have a relationship with the food producer and that is a perfectly respectable position to want to get to. How do you get there? What are the policy levers? What do you have to do to get there?

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30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard

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**Mr Melchett:** To give you an example, Monty mentioned the work we are doing with schools which is funded by the Big Lottery. We are working with a partnership of other NGOs and what we are aiming to do in primary and secondary schools which we are working with and we hope to enrol thousands—we already have hundreds involved around the country in all areas—is to get the schools to move towards a school meals service which is 75% unprocessed foods, but one of the first changes, as Monty said, like growing the chives on the windowsill, you get back to people cooking fresh ingredients which reduces cost and reconnects you with farming, the seasons and so on. 50% of it has to be sourced locally in this Food for Life Partnership programme and 30% is organic. This is a first step. Children in the Food for Life schools visit farms, not just to go and see the farm once a year, but so the school has a relationship with the farm, ideally the farm supplies food to the school. They learn about food, nutrition and all the rest of it as part of a whole range of lessons in their curriculum in all sorts of ways, and of course learn to cook. All of that and the school should have a garden where they are growing some vegetables which then end up in the school meals that they are eating. What we are talking about there is a change in culture. You said this is a massive change but of course to take 80% of greenhouse gas emissions out of food and farming implies more than massive, a really drastic change in what we are doing there. We would see the Food for Life model as a way of starting on that process, and it is not just about changing where the food comes from but learning about farming, cooking, growing, and the Food for Life standards are applying in restaurants, hospitals, nurseries and even in food served in football clubs. It provides a model where we can start to get the whole of society engaged in this process.

**Q416 David Taylor:** An observation and a question to Monty. You mentioned the interesting idea of requiring new houses to have an associated allotment. A typical house plot size is probably 300 square metres, not untypical are allotment sizes of approximately 300 square metres. That seems to me to be doubling up twice the amount of land within or close to estates than is currently used at the moment. That is my observation. The question is we are talking about reconnecting with consumers to the origin of the food that they eat. Do you think that TV, on which you are a very distinguished proponent of such things, could be doing much more to re-establish those links? The reality is that consumers are likely to be much more influenced by watching TV than ever they are from government pamphlets pouring through the letterbox.

**Mr Don:** Yes. Interestingly I am starting filming in a couple of weeks time a Channel 4 series about farming which Channel 4 see as a revolutionary thing to do, for god's sake, which shows how parlous and how limited that connection is. I think we have all got to take a role but parliament and government can and should play an active role. The whole disassociation is not just one when you go out to the shop, but it is a social thing. One of the things that is

not talked about in connection with food is the social effect whereby you have a disenfranchisement in the relationship between food and production. That is something which government and parliament needs to regard almost as importantly as the means of production or the method of consumption. I have done a little bit of work in that area with social behaviour and drugs and what have you, and food is right at the core of it. It is absolutely at the heart of it and we do not make that link between production and health, which of course is a key part of organic growth.

**Q417 David Lepper:** You have talked about the Food for Life project in schools. I think you said there are other institutions and organisations that have taken it up as well. Has it been going long enough to be able to trace whether the kinds of habits that obviously you hope people will be imbued with whilst they are at school carry over once they leave school? Have you been able to attempt any research?

**Mr Melchett:** The Food for Life Partnership has five-year Lottery funding and is being evaluated by independent academic evaluators and researchers. We do not have the results of that. What we have are a number of interesting anecdotes which I suspect will be confirmed because they are so universal. The first is that teachers who have experienced children in school with poor standard school meals which are then changed universally say the thing they notice is the change in behaviour of the children and the children's willingness to learn. Most head teachers will also talk about rates of attendance improving, truancy going down and timeliness of attendance at school going up. In hospitals, for example, we do know that patients' satisfaction, which is a measured regularly by the NHS, goes up when food is good. The Royal Cornwall Hospital Trusts have done this and registered a significant increase in patient satisfaction. The other thing we know is that when you change the food in a primary school so that it is freshly prepared and cooked at the school, healthier and so on, that when the children first of all go home they start pestering their parents, not for a McDonalds, but for a baked potato or for a pasta with a vegetable sauce. When they get to secondary school, the secondary school cooks complain to the primary school that the kids will not eat their deep fried "wotsits" anymore. The evidence we have is not solid yet but we will be gathering evidence, but that is what we expect.

**Q418 David Lepper:** The School Caterers Association last week seemed to have a rather different view. They were not necessarily talking about organic products but about Jamie Oliver and things.

**Mr Melchett:** We had representatives at the meeting who were putting a contrary point of view. I am afraid the media agenda is a bit "Jamie got it wrong" and it is hard to get any stories which show that actually Jamie got it completely right into the press. I think Jamie did get it right and schools which have

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30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard

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changed their meals have seen an increase in take-up, the ones we are working with often 10%, 20% or even more, up to 100% in school meals increased take-up, but you have to change the whole thing. You cannot just fiddle with nutrients; you have to change the culture.

**Mr Maynard:** It is not just about changing the culture in school but you actually change the farms that supply the school because they have to produce a wider range of crops so they shift to a more mixed farming system by default because they have a secure market through the school and so you are starting to rebuild that resilient mixed farming system which served us very well during the last war. You talked about you do not want to go back to the days of the War Act, but we have some fairly hefty challenges, probably as threatening to food security as a U-boat's torpedoes, in the form of climate change. Even if oil is \$50 a barrel now, it is probably going to go up in the not too distant future again.

**Q419 Chairman:** Peter, you mentioned in your opening observations about the importance of soil. I would concur entirely on that point but you developed the idea in your evidence that in some way good soil management should be rewarded by the single farm payment scheme. I was slightly at a loss to understand how that would actually work in practice. How would you set the parameters, and whether, if you could not do it through a single farm payment scheme, how would you get an improvement in soil quality?

**Mr Melchett:** It is a very interesting area and we have been talking to a number of experts. We have some leading soil scientists and global leaders in soil science in the UK and it is an area which I think the Government has really shamefully neglected; the research and what they could learn from the research. Soil carbon is a very significant contributor historically to the carbon we put into the atmosphere.

**Mr Maynard:** In terms of carbon store, soils hold double the atmosphere and three times the world's forests.

**Mr Melchett:** It is huge. We have depleted the carbon stored in the soil significantly, not just in peat soils like the fens where we know it is oxidising, but in all our soils. The potential for carbon sequestration in soil is significant. It is very difficult to measure on a field by field or farm by farm, year by year basis because the changes are quite small. In that respect it is quite like farm wildlife where it is quite difficult to measure the number of skylarks on a particular farm year by year and reward the farmer per skylark, as it were. We thought, and we are exploring these issues with others in this area, first of all, that under Pillar 1 the good agricultural and environmental condition could encourage farmers to do the sorts of things they need to do to maintain soil, and maybe more significantly we are suggesting that under Pillar 2, under the entry level scheme and the organic entry level scheme, there should be prescriptions and recognition for the fact that organic farming will increase soil organic matter and therefore increase soil carbon significantly in many cases. Just as we

have rewarded organic farmers for delivering more farm and wildlife—£60 per hectare as opposed to £30 for the non organic entry level scheme—we think there is strong evidence for bringing climate change into Pillar 2. That would, we think, help secure the CAP payments as we move from Pillar 1 to Pillar 2 for British farming generally.

**Q420 Chairman:** You would have to have an objective measure in some way to monitor this because otherwise you are talking about encouraging people to good farming practice which if you do not put organic material into your soil in the current arrangements, you just do not do it and just carry on.

**Mr Melchett:** With organic farming, just like organic gardening, you have to. It is inherent in the system. For example, our plants will have denser root mass and a longer root because they have to search for nutrients more than the non organic similar plant and that will be returned to the soil. We would almost always have winter cover crops if we harvest in the summer/autumn and then plant in the spring. There are the green manures used in organic systems and so on. It is an inherent part of organic farming.

**Mr Don:** A farmer will pursue the best possible result using the techniques available and these become self-evident as you use them. It is not something that has to be spelt out.

**Mr Melchett:** I farm on chalk and sand in northwest Norfolk and this year for the first time ever the muck-spreader got stuck in the mud. Mud is unheard of on our farm but it just retains far more water after 10 years of organic farming than it ever used to. The difference is extraordinary.

**Q421 Chairman:** My allotment bears testament to that. I do not want you to bring your tractor on to find out if it is suitable. Let's move on to your observations about the Cabinet Office Strategy Unit report Food Matters. You rather felt as in these comments on food security that the final version has been somewhat watered down from the beginning. This is an interesting piece of intelligence. Would you like to enlighten us some more about that?

**Mr Maynard:** The quotes we gave you were from an early version of the report which came out in January 2008 but in the final version which was published in July in the summer, they disappeared. We were very enthusiastic about the Cabinet Office Strategy report because it recognised the issue of climate change and resource constraints and it also recognised the issue of diet and ill-health. There were very powerful statements from that report. You said at the beginning, Chairman, that Defra are starting to look at this and indeed they are and you can certainly see a transition from 2006 when their first report came out on food security when they were incredibly complacent about climate change. This was really only a problem for the developing world and we would be fine. Then by 2008 their latest report was a little more robust, but still looked to the UK as a rich trading nation, able to go out on the world market and get food. That seemed to be where Defra was coming from and the Cabinet Office

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30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard

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Strategy seemed to be slightly pushed back into the distance. Similarly, the other report, which has been a very powerful influence, certainly to my thinking, is that from the International Assessment of Agricultural Science and Technology for Development under the chairmanship of Professor Bob Watson which said exactly as you said that business as usual is not an option and we do have to change. This is the work of 400 scientists; it is not three people from the Soil Association. It looked at some of the approaches that should be taken but it just does not seem to be influencing Defra or government thinking in the way that you would expect, given the chairman is now their chief scientist. We have a few warning bells going off.

**Q422 David Taylor:** Let us talk numbers. Like every other accountant I am not happy unless we can measure something and look at things from that perspective. The second point that we put into the inquiry framework did quote numbers and it talks about the challenge of increasing global food production 50% by 2030, which was one that was drawn from the UN Secretary General, Ban Ki-moon in June 2008, the further challenge 20 years later to double world food production from where we are now, not least to feed the world population that is about a third as large as where we are now. You take the Committee to task in a way, and there is nothing wrong with that, in saying that to talk about food production is to too narrowly focus this particular inquiry. You are looking at the calorific value of what is produced at the moment and you point out that two billion are clinically overweight in the north and one billion malnourished in the south. How can we link those two very easily? Is it not too facile a link? How will reducing obesity in our hemisphere actually address the problem of malnourishment elsewhere?

**Mr Melchett:** It will not, of course, any more than us producing more food here, reduce malnourishment in the south. We need to have systems, as Monty said earlier, in every country which are sustainable environmentally, which are capable of producing food for the population without reliance on the massive use of fossil fuels and big greenhouse gas emissions because that is going to come to an end between now and 2050. What we can do, if you look at the Reading University report we mention in our evidence which looked at what would happen if all of England and Wales was farmed organically,<sup>21</sup> taking existing levels of production, you would of course stop feeding about half of the grain we grow to animals—chickens and pigs primarily, but also high performance dairy herds—and as a result we would have less meat, but more of it would be grass-fed which the UK is particularly suited to. You would probably end up with as much grain and pulses available for human consumption as we do now. In any look at what we need to produce and how we are going to do it, we think that we also need to take into account significant changes in diet. That sort of system, according to the UN agencies involved like

the UN Convention on Trade and Development, is also most suited to feeding people in Africa, for example. They have just published a report, which I think we refer to in the evidence, which says looking at a large number of projects in Africa, organic systems work best to feed local people precisely because they do not rely on expensive imported inputs like seeds or fertilisers or sprays which African farmers are not in a position to buy in any event.

**Q423 David Taylor:** Robin, you have signed up to the evidence sent to us by the Soil Association. You do accept that a growth in volume is necessary, not just a change in mix because we have got a world population growing by a third possibly in the next 40 years or so. We do need to increase production, do we not?

**Mr Maynard:** I accept the point to a degree but the point we were trying to make is ironically and sadly that the world produces enough food to feed everybody now and for the future according to the World Health Organisation and that is where that statistic comes from.

**Q424 David Taylor:** And for a future which has a global population of what?

**Mr Maynard:** That is debatable and questionable. That is where we need government to be looking at what is the capacity of everyone's country and land to feed their populations. If you consider China you start getting very worried about the figures of sustainable feeding of the world because every 12 million increase in population each year, which is what the country is experiencing, and every diminution of their land area which is also happening, means they are looking out to the world markets. Their need for grain is potentially the entire US grain harvest. There is no doubt it is a major challenge but we are wasting a lot of food in terms of putting it inefficiently into intensive livestock and, worse in the United States, they are putting it into car fuel tanks rather than people's stomachs. We are also using land to grow tobacco. There is a fair amount of land out there and calories available and that is where you do need government and international intervention. You just have to recognise that we waste an awful lot of food at present and we could adjust it so that we could feed people comfortably.

**Q425 David Taylor:** The NFU, the CLA and Natural England all broadly accept the figures with which we are working—the 50% and the doubling. The Soil Association are saying that we can feed the world at the moment and possibly into the short to medium term by changing the mix of food we produce and presumably by influencing consumers.

**Mr Don:** The two are wedded. You cannot just change what we eat. We have to address the consumer as part of the solution rather than just the end of the equation to the problem. We need to change our diets; we need to for health reasons anyway. We need to stop our waste. I am sure that you have heard endless accounts of how much we

<sup>21</sup> Ev 147

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 30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard
 

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waste and what we need to do about it. We probably need to eat a bit less and we need to pay more for it. These are politically not very acceptable things to say and do, but I think that is going to have to be addressed.

**Q426 David Taylor:** Governments that proselytize about eating less and say we are going to tax those things that are unhealthy for you, you can imagine the reaction.

**Mr Don:** That is why I do not think government is necessarily equipped to do it because inevitably it becomes another injunction about “you must not do”. The only way we are ever going to get anything done is to make people want whatever the end result is or to want it more than the opposite, which is ill-health, which is the effects of climate change. If we can change to a system whereby we eat a lot less white meat, the red meat that we do eat is grass and basically solar power, grow more vegetables and more fruit. We are all told to eat five fruit a day. I am sure you probably know that 90% of the fruit that we eat comes from abroad. We do not grow it.

**Q427 David Taylor:** We have the National President of the Fruit Association here.

**Mr Don:** It is a shocking statistic. There is wonderful fruit that we can grow here but we are not doing it. In other words, if we did what we can do so that it is efficient and we are not wasting from the farm or wasting the transport, not wasting the packaging, not wasting in the fridge and on the plate, what we eat is healthier. Peter mentioned the whole thing about organic growing is that the take-up of nutrients if you have a carrot that is healthy it is not just healthy in itself but it is healthier for you, whereas if you force it using fertilisers it will not be taking up trace elements and nutrients that you need. If you talk to GPs, one of the astonishing things that I found is that they will talk about malnutrition in middleclass otherwise healthy people because they are not getting the nutrients. The problem is incredibly diverse and complex and cannot just be broken down into one production.

**Q428 Chairman:** You put forward a wonderfully persuasive case. I just wish you would speak to the carrot root fly and tell them to go away. I would like to have the carrots that you describe. The problem that we face is that you did not describe, even in just framework terms, how do we get from where we are to the model that you have described? As I think David Taylor was pointing out, if you take all of the health messages—government has been at it for quite a long time—and take, for example, smoking, this House of Commons eventually had to introduce a legal ban on smoking in public places because all of the messages eventually were being listened to and parliament took a view about it. You have very carefully said that it would not be a good idea in terms of the world of food to have government continually telling people what they should not be doing. I suppose we come back to the fact that we have got to get from where we are to where you ideally want us to be and there is a limit to how much

the schools’ programme that Peter described is going to be able to do it. I just wondered if you had any insight as to how you actually move the public opinion in the way that you would want?

**Mr Don:** Government and parliament can play a role by facilitating and enabling people to do it for themselves rather than telling them. I think the schools programme is a good one because it is not trying to change everything in every way overnight. You are simply drip-feeding in possibilities and opportunities. Unless people take it up themselves, it will not happen. Unless the children go home and asked for the baked potato rather than a pot noodle it is not going to work. You cannot say “you shall not have a pot noodle”; it has got to be desire. When I said that it needs to come from the ground up I was trying to be practical because I think that is really the only way it will work. People like me can try and change the way people work on a day to day level, but what I cannot do is what you lot can do is change the structure or facilitate that. At the moment in all sorts of ways it is quite difficult whether it is health and safety restrictions, whether it is to work locally the facilities might not be there. Abattoirs have gone; they just do not exist if someone wants to make sausages locally. If we tie in health with social behaviour, which is vital, production and also security, having resilience against the domino effect, they do not need to work in a heavy-handed way. It is very impractical to say right, we will get schools doing this; we will get hospitals engaging with farms. If people cannot afford food why are we not subsidising their food in the same way as we subsidise their prescriptions or their housing? Why do governments not see healthy good food as a necessary part of a healthy good society rather than as a luxury? That is where governments come in again.

**Mr Melchett:** Somehow or other, if the legal requirements in the Climate Act can be met we will have to take 80% of greenhouse gas emissions out of food and farming, or because it is one of the big four sectors for emitting greenhouse gases alongside energy generation, transport and housing, you are going to have to take 100% or more out of other sectors, which is not feasible or realistic. It is going to have to happen between now and 2050. We all have to find a way of making it happen and the Government has a legal commitment to do that. I understand that you asked for some insight on the Cabinet Office Strategy Unit. This proved to be one of the more controversial points when the first report was discussed with different departments. They could start by looking at their own procurement and making sure that they are buying, and government departments have a big budget to spend on food, as climate-friendly food as they possibly can. When you mentioned the House of Commons in that connection, the House of Commons of course could think about making the food as climate-friendly as well as I am sure very tasty and as good value as it already is. There are things people can do to send signals about the fact that we are going to have that huge change take place in the next few decades.

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30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard

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**Q429 David Lepper:** David Taylor is encouraging you to look to the future in terms of the predictions that have been made about what would be needed and the extent to which organic methods can help to satisfy those needs. The University of Reading has produced this report England and Wales under organic agriculture and how much food could be produced. I think it is true that, Peter, in your introduction you describe it in a sense as an informed guess. Elsewhere you talk about the report being “the first step” to looking at what food is being produced in England and Wales through organic methods. How robust is this report in terms of indicating potential in satisfying the demands for food?

**Mr Melchett:** That is a very interesting question. I think it is robust in this sense. First of all, the Centre for Agricultural Strategy at Reading University is very well respected in this particular field and they use data collected by the Government in the farm business survey. The baseline data is good, the academic work is top grade and they have made their estimates by multiplying up what existing organic farms in the farm business survey produce to fill the land area available. Where we would say it is a first step is in this sense that it is looking at what might happen 20, 30, 40 years down the line without taking into account huge changes which would inevitably accompany the growth of organic farming. We know that by looking at countries like Austria and Switzerland which are a long way further down this track than we are. We know, for example, that the amount of research effort that goes into organic farming in countries like that is far higher than here, which is why when I grow a new variety of seed, milling wheat, it has been bred in Germany, not in the UK, or when the NFU spokesman on organic agriculture plants a new organic apple orchard to supply apples to Sainsbury’s, the apples have been bred in Italy or Switzerland and not in the UK and it is a tragedy. There are countries in Europe who are further down this track than we are and we know that there will be more R&D going into organic. We know that that will greatly increase the potential for higher levels of production from organic systems without any additional chemical or oil inputs, and we know that for many of the positive effects of organic there is some scientific evidence to suggest that they will be enhanced as organic farming spreads. We know, for example, that farming and wildlife would benefit from bigger blocks of organic land as of course would reducing water pollution and other things which organic farming does. As it spreads the impacts will be more than the sum of the parts concerned. Machinery is another and I could go on.

**Q430 David Lepper:** One of the questions we ask in this inquiry is what should Defra be doing? It sounds to me from what you are saying that one answer to that would be about the extent to which Defra can direct research and development in this country and maybe there is a role for government in making decisions of that kind.

**Mr Maynard:** There is massive disparity between the amount of publicly funded R&D that goes towards organic, compared to that towards biotechnology in particular. The last figures I saw were something like, if you were generous, about £1.6-£2 million per annum to organic and at least £49 million, possibly £70 million of public money, to biotechnology. There are no GM crops commercially grown in the UK at the moment whereas the organic sector is still seeing some growth. It does seem disproportionate in terms of R&D. You can see the analogy between the renewable energy which you are familiar with of renewables in this country and nuclear and others where the renewables have been starved of R&D funds for years and therefore we are a bit further behind than we could be when we really most need them.

**Q431 David Lepper:** Why does the Reading University report only look at England and Wales?

**Mr Melchett:** It is because Scotland collects their farm business data separately. We had to wait about a year to get the latest data from Defra. Reading University are one of the universities that collect farm business data, so they have access to that.

**Q432 David Lepper:** There could be a Part 2 to this?

**Mr Melchett:** There could be a Part 2. My colleagues in Scotland are looking at that.

**Q433 David Lepper:** Monty, you suggested a little earlier, and I wish I had written the phrase down, that the kind of future you want to see is not necessarily all organic—perhaps ideally it is but in realistic terms it is not—but a mixture of organic and non organic farming methods. Could you enlarge on that?

**Mr Don:** Sometimes there is this idea that organic is a fundamentalist viewpoint and view organic as beyond the pale. There are plenty of farmers who are not organic but who are superb farmers doing an incredibly good job and I admire them enormously. I think that would apply to any organic grower. I do not think the world is ever going to be wholly organic. What is important is that we are facing a crisis and we all have something to contribute. Quite frankly, in times of crisis you do what is best and if there are some people doing superb things that are not organic, then let them get on with it. All we can do is to try and inform and encourage people to use organics to its maximum potential; that is key. What the report says is this is not an idyll; it is really practical. It is a way of dealing with a specific problem.

**Q434 David Lepper:** In terms of those other criteria that you quite rightly talked about—climate change, health and about the economy—you would see a kind of mixed economy and it is a question possibly in addressing all of those issues.

**Mr Melchett:** This picks up the point, Chairman, that you made about how is this going to happen. Last year, when the oil price was a good deal higher than it is now, we got one of the leading farm business consultants, Andersons, to look at the



30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard

impact of changing oil prices on a model—they have a model, non organic farming—and we asked them to look at the impact on organic rotations, the gross margins of the whole rotation, not individual crops, and of course there will come a time if oil becomes scarcer and more expensive as a result and natural gas becomes more expensive and therefore fertiliser rises in price, then actually it is cheaper to produce food using the sunlight and clover than using an artificial fertiliser. Then maybe you will need to form a society for the preservation of non organic farming just to keep a few demo farms open to see what it was like in the last century. It will become too expensive, I suspect, rather than die out for any other reason.

**Mr Don:** Last summer one of my neighbours—I have a little farm in the Black Mountains—who teases me a lot about being organic, came up to me and said the trouble is the way prices are going I am going to be forced into becoming one of you lot, and how we laughed, but the point was it is going to be driven by economics for farmers in particular.

**Mr Maynard:** There are plenty of farmers who use organic techniques, such as clover, and they are not organic farmers.

**Q435 Chairman:** One of the things that struck me—I have not read every word in the Reading report but I have had a good look at it and I have looked at the discussion at the end—and that I found lacking in it is that it is very strong on inputs but it is not so strong on risk. It does not talk, for example, about if you increase the proportion of UK food production that was from organic sources, it does not talk about what happens if some new disease or pest arises and how you would therefore cope with it within your regime as at the moment. Going back to the visit to Jealott's Hill and we have been to Rothamsted and we have been to John Innes, you will not be surprised to learn that one of the lines that they put to us were the developments in modern agrichemical techniques to counteract growing plant disease, for example, and one of the things that concerned me was how vulnerable would a system be if you increase the proportion of food coming from organic sources, you therefore cannot afford to have complete crop failure because you are not able to deal with a pest or disease. How realistic is that threat?

**Mr Don:** Any organic grower absolutely works on the basis that it is a healthier system. You have less risk of crop failure by growing organic, partly because of the careful and at times quite sophisticated use of companion cropping and rotations and timing, and partly because you are not dependent on monoculture. You have to have mixed farming; you have to have a variety of crops and animals and you need the manure and you need your own self-contained system.

**Q436 Chairman:** Let's get off the manure bit because that is the relatively easy bit of the organic side. I am interested to know how robust the system is, because perhaps Peter might also like to comment when you have finished, Monty, on your observations, because when you look at some of the crop threatening

conditions that are outside there, for example, that have to currently be dealt with in conventional farming by use either of pesticide or fungicide, we have to know if a greater proportion of our food supply was dependent on organic techniques how we would cope because those diseases are not going to go away, are they?

**Mr Don:** No, although if you used artificial fertilisers you get a very different kind of growth. You get a much sappier growth and a much faster growth and they are much more prone to fungal infection, much more prone to insect attack and damage, so therefore the whole organic system tends, and certainly intends, to breed healthier plants. That is one really important key to it. It is a less risk involved. You do not get these plagues—rust on wheat or blights—for instance, potatoes if you grow them organically, if you talked to any farmer growing potatoes 30 or 40 years ago blight was not very common, but now, particularly in Herefordshire where I live, it is absolutely endemic because of the system that is just using fungicides on blights and fungus symptomatically instead of trying to get a system that is fundamentally healthy. What we now have in non organic farming, and gardening too—it is the same idea—is a fundamentally unhealthy system which you fight and deal with, whereas organic farming and growing is about creating a fundamentally healthier system.

**Mr Melchett:** To give you an example from my family experience, I have been involved in farming since the late 1950s, most of that period non organic. During that period wild oats became an increasing problem in cereal farms in East Anglia—it is the equivalent of black grass and other weeds in other areas—it was not a problem immediately after the war. It became worse and worse to the point where, we are seed producers and we were non organic and are now organic seed producers, we would have to have people hand-working in the fields for wild oats or use very expensive and difficult sprays to try and control them. When we converted to organic that was my major fear and all my neighbours thought that we would have fields just completely covered in wild oats. The problem of wild oats has decreased year by year since we went organic. There was a dramatic fall immediately and we still hand weed because we are growing seed crops—seed wheat, seed barley and seed peas—but the amount of time the gang spends on the farm has halved, maybe less than that, and wild oats are very much less a problem. It is partly because we have brought back a much more varied rotation; it is partly because a lot of these weeds of modern arable farming, like the fungal diseases, are diseases of nitrogen fertilised crops. They are diseases of thicker, weaker crops, grown closer together. When you stop using the fertiliser you really do not need pesticides. There is a piece of academic research at Newcastle University, and you visited three of the leading pro-pesticide research institutes so you might think about visiting one of the leading European organic research sites at Newcastle University at the university farm where they have done some very interesting work in looking at the relationship between artificial

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30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard

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fertiliser and pesticide use showing that the one and the other go together and the economic drivers for using pesticides if you use fertilisers are irresistible for farmers. I think we would be more resilient, both in the variety of crops, resistance to disease and it is true of livestock I have found with breeds of pigs on the farm too. I am not suggesting that we are not all threatened at some point or another and that is true for non organic farming as well as organic, but we are going to be better off overall.

**Mr Maynard:** In terms of the system, Chairman, the foot and mouth epidemic was a classic case of a very centralised system spreading a disease fast. A more localised system where there were more regional markets, there were more abattoirs rather than pigs going from Northumberland down to Kent and to Devon, would seem to be a more resilient system. We have lost thousands of abattoirs and you saw what happened, as was mentioned earlier, during the fuel protest when a few pretty mild mannered truckers and a few farmers closed down some food distribution depots and oil depots and London came within three days of running out of food because there were not the hubs because supermarkets were relying on we do not stock stuff really and we have very little in store; we just bring it down the motorway. Suddenly you see that system is much less solid than we have been led to believe.

**Q437 Chairman:** I am a bit concerned that your Reading report seemed to be pointing, certainly as far as the cereal outcomes were concerned, that your minor cereal crops, as it describes them, of oats, rye and things like that would get removed from the regime as one pushed on for the quest for wheat, and yet in terms of, for example, micronutrients, rye has a great deal to contribute. I am rather surprised to find a report like that which seems to subscribe to the removal of the kind of diversity you have just espoused.

**Mr Melchett:** I do not think Reading was predicting the future. What they were doing was taking the system production and multiplying it up. Because you are working from a small statistical base there are oddities and one of them was that they found production of some of the minor cereals would increase to hugely high levels and they thought that was just unrealistic and a feature of the data they started with. We are not suggesting this is the future, as I think I said in the foreword, as you mentioned that Reading is a starting point, but it does show that it is not impossible to foresee an agricultural system which is not wholly reliant on fossil fuels for fertility effectively.

**Q438 Chairman:** To sum up, the main message is that you believe following your methodology that we could have a substantial increase in production, but if I am reading you correctly you are not advocating moving 100% the whole of the UK agriculture to an organic regime. You recognise that there may be limitations and that the two systems would have to co-exist, but in terms of achieving a sustainable, durable, robust and secure form of food supply that the approach you have outlined could make a

contribution and a substantial increase in production. Would that be a fair summary of where we are?

**Mr Don:** We would like to see the whole of the UK agriculture organic but we are not saying that is (a) likely or (b) necessary—personally I would like that a lot—but I think we can feed ourselves. Two keys things: flexibility, we need to remake the model of our food production. It is not going to work with all the constraints and changes that are being forced upon us. We need to connect far more actively than we are now health and food and society and food. At the moment the gulf is terrifying.

**Q439 Lynne Jones:** I do not want to put words into your mouth but in terms of the response to the Chairman's question would it be correct to say that you want to see a smarter type of agriculture so that we reduce the influences that contribute to climate change? I think you would agree that we need to move in that direction.

**Mr Maynard:** I think that is a very good way of putting it because it is a very simplistic approach just to pour nitrogen on—

**Q440 Lynne Jones:** You have to have a sense of direction, a roadmap, to move on from there.

**Mr Don:** One of the things that we need though, I am sure you are all aware, is that we are losing a lot of the skills in agriculture and growing generally that are still just there and they need to be actively reintroduced through training, education and opportunities. Without those skills you will not be able to respond.

**Q441 Lynne Jones:** I am particularly interested as a scientist myself in research and development. We have had a lot of evidence and I think you would also agree that there is not enough investment in agricultural research and you have also said that there has not been enough in organic research. Two separate questions: the balance between our existing research, which I think everyone agrees is probably inadequate in terms of the amount of research that we are funding, and the balance as between organic and non organic. Do you have any A-rated research projects that have been turned down for funding? You seem to be implying that there is somehow a downer on organic research and there has been more of a push for a biotech type research. Is there any evidence for that that projects that would be A-rated on organic farming agriculture have been turned down?

**Mr Melchett:** I do not know whether A-rated projects have been turned down or not and of course it is not very often publicised. What is clear as people who are interested in the results of research, we do not do our own research, is that most of the useful research has been funded by the European Union or is being done in America where there more diverse funding flows into agricultural research. Most of the useful data is generated through EU-funded projects, particularly most recently a big €70 million Quality Low Input Food project which involved about 30 or 40 research institutes all over Europe

30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard

which was led by the University of Newcastle, so led by the UK but involved researchers from all over Europe and outside and is just coming to the end of the five-year programme. On a practical basis when you look at what farmers are doing, the new varieties for a lot of the crops where we are short of suitable varieties in farming come from European crop breeders. I am desperate to get a new weeder for my farm to lift creeping thistle or couch grass that has been designed in Denmark. They are all being imported into the UK. It is just like wind turbines. All the wind turbines are being imported from Denmark where they started a new industry based on what the future was going to be and the UK is left importing stuff and the same is happening in farming.

**Q442 Lynne Jones:** There does seem to be a measure of agreement then that crop breeding is important in terms of producing higher yields. It has been in the past and it will be in the future. Why no GM?

**Mr Maynard:** We are not anti-biotechnology. We are quite happy with marker assisted selection where you are effectively using a genetic microscope to find the traits you want and then transferring those through traditional breeding without going down the route of transgenic crops. It is a myth to say that organic farmers are anti-science or anti-biotechnology. We have concerns about the GM transgenic crops which we do not see any benefits from. We do not have a disagreement with you on that.

**Q443 Lynne Jones:** Why do you not see any benefit from them? You are trying to transfer traits using conventional breeding. If you can have the same effect using genetic modification, why not use it? Obviously nobody is advocating any kind of genetic modification is acceptable, but that is what research is about, is it not, to find the traits that are going to be beneficial and not to use those that are harmful?

**Mr Melchett:** The objection to that particular technology has always been the levels of uncertainty and risk inherent in introducing genes from outside of that particular genome into it. We think what little evidence there is, and there has not been enough research we feel, indicates that concerns about risk have been well-founded.

**Q444 Lynne Jones:** We have had genetically modified crops and you might argue that some of them have had to have fossil fuel inputs into them, but some have had less fossil fuel inputs. You may have environmental problems in relation to monoculture just as you do with a conventional crop. Can you give me any examples where, *per se*, GM crops are harmful, both in terms of food safety or environmental impact?

**Mr Melchett:** First of all, I do not think there is a GM crop that has been developed which does not need the same levels of artificial fertiliser as conventionally grown crops. No nitrogen fixing traits have been achieved and many scientists say they will not be. There was a study published last year—this could be a long discussion so I will try and

keep it short and I am happy to give you more evidence if you would like it—which was funded by the Austrian Government and carried out by two leading research institutes in Austria which looked at the effects of GM maize on laboratory animals (rats or mice) which did find sufficient grounds for concern for the scientists involved to say that more research was urgently needed.

**Q445 Lynne Jones:** What journal was that published in?

**Mr Melchett:** I would have to give you the reference.

**Q446 Lynne Jones:** Most of the scare stories are usually not published in peer review journals.

**Mr Melchett:** This was a study published in a peer review journal done by the two leading research institutes in Austria and funded by the Austrian Government.

**Q447 Lynne Jones:** But humans have been eating this stuff for over a decade.

**Mr Melchett:** As a scientist you will know what an appalling unscientific view it is to say just because something has not happened which nobody has investigated it cannot be so. Nobody has investigated the effects of eating GM on human beings. There has not been a single peer review study published which would justify any scientist saying this is not harmful; not a single peer reviewed study.

**Q448 Lynne Jones:** I cannot see how if I eat lecithin from GM soya it is any different from lecithin from non GM soil.

**Mr Melchett:** One of the reasons would be that when you make the transfer of the gene you affect not just the insertion site but other sites in the DNA, but the safety regimes in both North America and the EU do not require the companies to investigate other insertion sites or the effects on the DNA; they simply look at how the crop behaves when it is growing and if it grows like other maize then it is treated as if they are substantially equivalent and is cleared for animal/human consumption but you do not know what effects it is having elsewhere on the DNA and that is why long-term intergenerational animal studies have always been something that people who are concerned about this have asked for and why the Austrian study was published last year was so significant.

**Q449 Lynne Jones:** You obviously do not accept the general consensus that GM food is safe then?

**Mr Melchett:** I do not accept that there is a general consensus that GM food is safe. I would say that outside people involved in the industry there is a general scepticism that GM is safe, which is why, amongst many other reasons, all the new GM crops in North America have been rejected, either by consumers or by farmers and why they have not grown GM wheat, which has been available for nearly eight years. American consumers started to reject GM hormone milk along with the European Union and the Canadian Government but not the American Government.

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30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard

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**Q450 Lynne Jones:** There is some GM food that even I might object to. What I cannot understand is if genetic biotechnology can actually improve the yield, reduce the input, that you are against even trying to see what we can do. When I was in Brazil I was told by Embrapa that they do research into nitrogen fixation, for example, in sugar cane. Other people have suggested that actually that would so much weaken the plant, so I am not suggesting that it is going to be, but at Rothamsted we had examples of their breeding flax so that it has a higher proportion of omega-3 fatty acids, for example. You are just rejecting all possibility from that kind of research in terms of nutrition and possibly reduced fossil fuel inputs?

**Mr Don:** I slightly reject the assertion that this is a sort of Luddite stance that is refusing to deal with progress. I am not a scientist so I will not try and defend on science but I will report two things that I hear again and again and they tend to be from young mothers who feel that GM food, obviously with concern for their children when it becomes more than just themselves, is just not properly explored. They are not against it *per se* but there is a sense that it is not something that has really been exhaustively explored and, secondly, and this is a crucial factor, that it is in the hands of private enterprise and it has been developed above all else for shareholders and for profit and until such a time as it is done and controlled by governments for the people as an entirely profit-free exercise I do not think people will trust it.

**Q451 Lynne Jones:** In Cuba they do not have any private enterprise. They are investing a lot in biotechnology.

**Mr Don:** I have been to Cuba and I admire their system highly.

**Q452 Lynne Jones:** I share some of those suspicions but there can be publicly funded research and what I cannot understand is why the Soil Association is just saying we will not touch it with a bargepole no matter what the research throws up.

**Mr Melchett:** There are other examples. The Soil Association originally wrote GM out of its standards, that we would not accept GM, a considerable period ago. At the time scientists said it was fine—this is going back 15 or 20 years—and scientists were saying then that there would be enhanced nutrient crops in a few years time. They also said that all food would be GM in a few years time, back in the early 1990s, and they said that there would be nitrogen fixing and drought resistance a few years down the road. None of them have arrived. I went to East Anglia University and met scientists who were saying that when ICI was still the company doing the GM. The scientific claims which you are now repeating were being made 15 or 20 years ago and none of them have proved to be justified.

**Q453 Lynne Jones:** There has to be the research to repeat those.

**Mr Melchett:** Or the scientists who said that this is not possible, which many scientists have said for 15 or 20 years, may be right. There are different scientific opinions; we took one.

**Q454 Lynne Jones:** I am saying that I think it is possible and I would not put a timescale on it. Even if it was a long way ahead, why reject it out of hand is my point? We had the National Institute for Agricultural Botany talking about things like having perennial cereal crops so we do not have to plough the crop, for example.

**Mr Melchett:** The reason we reject it is because of the inherent uncertainty and the inherent risk and because it is at odds with the organic values just as we rejected, at a time when all scientists said it was perfectly safe, the feeding of cattle brains to other cattle. We were derided for being Luddites when we said that we did not accept that because we did not think it was natural. With the benefit of hindsight, the scientists who were deriding us and calling us Luddites were wrong and we were right. We think that studies like the Austrian Government funded study are going to show that those who have been concerned—many scientists, including in the US Government agencies for the last two decades—about the safety and reliability of this technology are likely to be proved right. That is why we rejected it.

**Q455 Lynne Jones:** You have to be concerned about any possible downsides and you have to do the research. My point is that if the results of that research can produce something which reduces fossil fuel inputs, improves yields, then why reject it? It is not just about having us self-sufficient here for our own needs. When we went to Rothamsted they showed us a map of the world and where the most advantageous areas were for agricultural production and it is places like Britain and Europe. We have perhaps within the context of climate change not just to consider “we’re all right, Jack” but also to consider our responsibilities towards other countries.

**Mr Maynard:** It is interesting that UNEP & UNCTAD, the United Nations Environment Programme and the Conference on Training and Development, point to agroecological methods and organic farming as most appropriate for farmers and hungry people in the south, more so than the claims of the GM industry which have yet to actually produce anything which would benefit those people.

**Q456 Lynne Jones:** What do you mean by “agroecological”?

**Mr Maynard:** There are a huge range of techniques. Organic is defined in the UK and it is within an EU regulation and so forth, but it is everything from intercropping to the traditional varieties to rotations and here in the UK where farmers, and not just organic farmers, are using rotations including clover. It may be a lot more exciting for a laboratory or scientist to look at GM as the coming thing, but there is plenty of work to be done on improving existing techniques which are working in delivering food to market and delivering value for money for

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30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard

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the farmers. It seems that those are overlooked. It is a bit like nuclear was always much more exciting than wind turbines and I never really quite understood why.

**Q457 Chairman:** There is a very interesting point that comes out of this that you have taken a principled stand against the technology and you have produced some objective arguments from your position to say that is not for us, and I can respect that, but equally in your robust defence of an organic system being capable of dealing with pests and diseases, you are actually asking the rest of us to take that on trust on the grounds that the system is robust enough based on experience to date that it will cope. In the same sense that we do not know in the world of pests and diseases, for example, blue tongue was an unknown factor here until two or three years ago, but that has come along and there may be other things that are coming along in which your system “might” be found wanting. You might say: “Ah, but we can cope”, but, in the same sense that we have to trust that you can cope, the same could be said about the safety argument on GM; in other words, there is a mutual trust here.

**Mr Melchett:** No, Chairman. What we have done on GM right the way through is talked to farmers in places like Canada, the United States and Brazil more recently where GM crops are grown and heard what they have said and what their experience has been, so we knew very early on, for example, that organic farmers in Canada could no longer grow oilseed rape because the level of contamination from GM oilseed rape was such that it had become impossible to grow the crop. That denial of choice, which incidentally is why an American judge ruled the introduction of Monsanto’s GM alfalfa illegal, was one of the things that influenced us. Another thing that has influenced us is that we have heard the experiences of farmers using GM crops to feed their animals and seeing their animals die; a very familiar story from India. We have heard what has happened in Brazil to people growing GM soya. This is actual experience where all of the seed was GM, all of it needed Round Up and Monsanto tripled the price of the spray.

**Q458 Chairman:** I respect the fact that you have argued it on the basis of observation to date. That is a perfectly respectable point to have an argument from, but the world moves on and science may change. Just as you have said to us: trust us, our system is robust. We believe we have a model that can deal with the pests and diseases that we know of at the moment because that is what we are dealing with, but we have to accept that that is a robust and well-founded line of argument for things that we do not know about.

**Mr Don:** With respect, and I sound like a politician speaking now, the organic system is based upon thousands of years of experience and trial and testing. New science, things will change and whatever happens that we can be certain of, is untried. What we are saying is that there is no

evidence that new science is going to solve the problems any better than what we have and also some worries that it may cause harm.

**Chairman:** I could equally point and say to you that the traditional system of many thousands of years might not be able to cope.

**Lynne Jones:** It is not the traditional system. We have had plant breeding techniques which if people knew the detail they would not think that that is in any way natural. It is not natural at all. It is human beings manipulating.

**Q459 Chairman:** I do not want this to become an inquiry into GM. As I understand it, F1 hybrids, which are an important part of the armoury of the grower in putting together the strong traits of individual varieties, it is a mechanical process of bringing them together. Am I right?

**Mr Don:** Yes.

**Q460 Chairman:** Mr Maynard was kind enough to point out that in terms of identifying traits that you seek, the use of gene marker technique is something that you do not disagree with. What I have struggled to understand is that if you take two lines of, say, cabbage and you see the characteristic in a gene in one cabbage that you would like to put into the variety of another cabbage you have to go through quite a longwinded process of plant breeding to achieve that, and that is perfectly acceptable, why do you disagree with taking the gene that you want from a variety 1 and putting it into variety 2 to speed up the process of producing precisely what the breeding technique would achieve but take longer? What I do not understand is why you would have an implacable and philosophical objection to achieving precisely the same result that breeding techniques would achieve by making an F1 hybrid.

**Mr Melchett:** It is not precisely the same because genetic modification involves moving the genes into the DNA, usually many of them with a viral promoter and a marker gene so you can tell whether the gene is inserted in the right place. In fact, MAS<sup>22</sup> breeding is proving in many instances to be a faster process for delivering a crop on the ground than genetic engineering. The idea that this is a very fast system is not proving right in practice. A lot of claims have been made in the past but actual experience has shown that they have not been right. When you get 400 scientists in the IAASTD report saying that really this is not the way forward—

**Q461 Lynne Jones:** What is IAASTD?

**Mr Maynard:** It is the International Assessment of Agricultural Science and Technology for Development chaired by Bob Watson.

**Q462 Lynne Jones:** He would not accept that as a conclusion.

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<sup>22</sup> Marker-assisted selection

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30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard

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**Mr Maynard:** He signed up to that.

**Q463 Lynne Jones:** I saw a presentation in this House and he made it quite clear that he thought there was a role for biotechnology and for GM.

**Mr Maynard:** We have not said there is not a role for biotechnology. I was at the launch of the IAASTD report in London and he was asked by a journalist from *The Telegraph*: “What do you think in terms of the claims that GM will feed the world?” and he said in an answer, “No.”

**Lynne Jones:** Nobody is making that claim.

**Q464 Mr Drew:** If I could just declare an interest, my wife and my daughter are members of the Soil Association. Do you get access to those who are looking at various forms of biotechnology work? I was an opponent of GM but I could see the benefit of biotechnology techniques. Does the Soil Association get brought into some of the discussions?

**Mr Melchett:** In this country the fact of the matter is that there is almost no plant breeding being done which is looking at varieties that would be suitable for organic systems anywhere at the moment. We are reliant on other European countries for that.

**Q465 Mr Drew:** Moving on to look at a different set of questions which is really to look at people’s perception of organic at the moment, particularly with the recession and supposed difficulties that that is causing for the organic industry. What is your take on that? Has there been a dramatic decline in the amount of organic being bought?

**Mr Don:** It is interesting as there has been a lot of talk about a decline but actually the decline does not seem to be as great as the anecdotal evidence. There is some decline because I think generally people are spending less and they are worried and also the really interesting part of your question is that people perceive organic largely to be something that is a luxury element of their lifestyle to a degree and that there is a sense that it is something that they can cut back on as part of their economising. I regret that greatly.

**Q466 Mr Drew:** You do concede that that is a problem at the moment.

**Mr Don:** It is a problem but I do not think it is as big a problem as people have reported; for instance, I think it was *The Independent* the other day which said that sales had dropped by up to 31%. There was one item which was bread and the one place that they checked had been 31%. I was talking to a large producer the other day who sells to a lot of supermarkets and he said the main problem they have is that supermarkets are cutting back on shelf space for organic goods so therefore they are simply not as available. That may be because supermarkets perceive that they are going to be less saleable. In other words, it is supply and expectation rather than demand. The perception of what organic is is right at the heart of this. What we are saying, and I hope this has come across, is that it is central to the way that we manage our health, our food and our landscape.

I do not think that perception is commonly shared by the public. There is a lot of work to do on that front. What we want to get across to you and what hopefully we really want government to be involved in is to take it seriously, to do proper research and to see if there is a component which is key to the essential business of feeding ourselves.

**Q467 Mr Drew:** Do you think you fail as an organisation or indeed as part of the wider organic movement in the sense that when the going gets tough one of the things that people are prepared to dispense with is what I would take to be a good healthy diet?

**Mr Don:** I agree.

**Q468 Mr Drew:** People are going back to more traditional, in the sense of more recent traditions, the stock diet of more processed food and cheaper food is what they have fallen back to.

**Mr Don:** We have a perception in this country in particular that cheap food is a virtuous thing; that somehow the cash price of food reflects its value. One of the great problems we have is that we have been living off food capital and that has got to be paid sooner or later. It is being paid for in our health, it is being paid for in our environment, in our ecology if it is not being paid for in price. Until people realise that there is a real price that affects them personally on a day to day level to pay, there will be a knee-jerk response to try and find cheap food, even if it is bad for them.

**Q469 Lynne Jones:** Are you going to withdraw the Soil Association recognition of farmed fish?

**Mr Melchett:** Of farmed fish that we certify?

**Q470 Lynne Jones:** Yes.

**Mr Melchett:** No.

**Q471 Lynne Jones:** It is not very sustainable, is it?

**Mr Melchett:** The Soil Association standards for farmed carnivorous fish like salmon—some of the farmed fish like the carp is sustainable and I would like to come back to the question about the market if I could in a moment—the fishmeal part of the diet is taken from off-cuts from fish for human consumption caught in the North Sea from sustainable fish stocks from MSC.<sup>23</sup> We are working towards getting all of the fish stocks that the off-cuts come from MSC certified. No farmed animal, whether it is salmon, cattle or chickens, are particularly sustainable in the sense that the food you put in is less than the food out, apart from grass reared beef and sheep in organic systems.

**Q472 Lynne Jones:** We are told that shellfish and mussels are sustainable.

**Mr Melchett:** Yes, and we certify those too. We have a market report coming out next week which will have all the latest information about how sales have gone last year and some for the first few months of

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<sup>23</sup> Marine Stewardship Council

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30 March 2009 Mr Monty Don, Mr Peter Melchett and Mr Robin Maynard

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this year. It has been a very volatile position, not as bad as Monty said in speculation by a long way. What is clear in all the recessions we have been through since the organic markets existed in the UK, and this is a first, is that the people who are committed organic consumers who tend to consume about 80% of organic products sold remain loyal consumers during a recession. There is a large bedrock of committed consumers who do have a good understanding of organic and who keep buying organic.

**Q473 David Taylor:** And are well off enough to be able to afford it.

**Mr Melchett:** They can be buying quite cheap food. They can be getting an organic box which will be cheaper than non organic vegetables in the supermarket.

**Mr Don:** It is interesting that you see it as an expensive thing.

**Chairman:** We will draw stumps now. We have had a good run round the subject matter. Can I close by making it very clear that this inquiry we are doing is in two parts. What we are trying to do in the first part is to lay out the challenges that we face that we have to tackle if we are going to deal with food security. We are not going to come out with a long academic treaty in technical terms of how you solve the problem. There will be aspects of our first report which will condition further work by the Committee. We are looking to make the agenda what are the major items that we have to tackle if we are going to secure our food supply in the long term. Can I thank you very much for your evidence and to being party at times to an interesting and robust discussion, which is always healthy, and also for sending us some very helpful written evidence and also a copy of the Reading report.

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## Wednesday 1 April 2009

Members present

Mr Michael Jack, in the Chair

Mr David Drew  
Lynne Jones  
David Lepper  
Miss Anne McIntosh

Dr Gavin Strang  
David Taylor  
Paddy Tipping  
Mr Roger Williams

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### **Memorandum submitted by Directorate General for Agriculture and Rural Development, European Commission (SFS 78)**

The questions raised by the Committee address food security in the UK context. Given the importance of the relationship between the Common Agricultural Policy (CAP) and food security, the Commission has been invited to make a written contribution and will make reference solely to the EU dimension.

#### EXECUTIVE SUMMARY

The European Food Industry is an important sector that accounts for about 6% of EU value added and 12% of EU employment. Although weak in economies of scale and labour productivity, it is strong in attracting sufficient capital and labour and is open to the world market (exports and imports are growing) and to competition (large number of enterprises).

From the late 1980s, rethinking of the CAP and the successive reforms over the period 1992 to 2008 mean that EU agricultural production can now respond to market signals in an increasingly open trade environment. This means EU agriculture is now better placed than ever over the last 20 years to participate in a re-balancing of the global supply and demand for food. Furthermore, given the depth and diversity of food culture and openness to innovation of the EU food industry as a whole, it is well placed for contributing to the global challenge of increasing food production by 50% in 2050. Improvements in productivity, in economies of scale and in the policy framework will, however, be needed to secure the achievement of this goal.

Production of raw materials by EU farmers will be eased thanks to an increased market orientation combined with adequate safety nets, which follows the consistent path of CAP reforms and adjustments initiated in 1993 and updated as recently as with the Health Check of the CAP. As food production is increasingly integrated with services, the liberalisation of the market for agriculture products and services, in the EU and worldwide, is also important. Increasing the production potential in developing countries is also essential.

Food safety supplemented by broader issues, ranging from health consequences of food to environmental consequences of food production are likely to condition consumption patterns in the future, depending on the divergent approaches to food across EU. The Commission is committed to enforce consumer protection rules enhancing the relevant legislation.

The European Commission has proposed in December 2008 a roadmap to improve the functioning of the food supply chain through, among other initiatives, the enforcement of competition and consumer protection rules in the food supply markets at European and National level; the review of problematic regulations; and the provision of better information to consumers, public authorities and market operators. The role of the future CAP will be to guarantee food production that is respectful to EU citizens' demands and is balanced across the territory of the EU.

In governance terms, the Commission launched a comprehensive strategy on Better Regulation, in order to improve co-ordination across policy areas, work more closely with Member States and reinforce the dialogue with stakeholders as well as promoting measures for simplification and reducing of administrative burdens, which are a necessary part of achieving long-term competitiveness.

Regarding the monitoring of the food supply chain and food prices, the EU believes that such action is required at the international level. In the meantime, however, monitoring will be done by the Commission, making use of information collected from EC delegations. Collaboration with other international bodies and particularly with FAO is foreseen.



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1. *How robust is the current EU food system? What are its main strengths and weaknesses?*

#### THE EU FOOD SYSTEM

The European Food Industry is an important sector spanning a range of economic activities. It produces a diversity of products from agricultural commodities to quality products. This range of products is produced by a limited number of world leading companies together with a large number of relatively unknown small and medium-sized enterprises—both of which exist side by side within the EU.

Figures made available from a major report on the EU food industry,<sup>1</sup> based on data up to 2005 and therefore with limited integration of new Member States into EU-27, the sectors making up the EU food supply chain—agriculture, food processing and the food distribution sectors—jointly account for approximately 6% of EU value added and 12% of EU employment. The food and beverages industry makes up 1.7% of EU value added, while the wholesale and retail sectors (including non-food products) account for 3.8% and 4.5% respectively. The size of these two sectors is typically larger in new Member States.

The European food and beverage industry employs around 4.5 million persons, accounting for 2.3 % of total EU employment in 2005. The European distribution sectors (including non-food items) employ over 26 million persons or 13% of total EU employment, with the wholesale trade sector accounting for 4.4% and the retail sector representing 8.5% of total employment. More than a third of them (3% of all employees) are active in food retail. The share of employment in the food and beverage industry and in wholesale trade is higher in the new Member States than in the EU15.

The economic importance of the food supply chain can also be gauged by the share of its final products—food and beverages—in household expenditure, on average 16%. This share falls as per capita GDP rises and vice versa. Consequently, the share of food expenditure is higher in the new Member States, where in many cases it exceeds 20%.

As a means of benchmarking EU labour productivity growth in the three sectors of the food supply chain, the average annual growth rate was estimated over the period 1995–2005 and found to be lower in the EU than in the US in all these three sectors. The EU-US gap is significant in the case of the food-processing (2.1%) and retail sectors (3.5%), but relatively narrow in wholesale trading (0.3%). In terms of the internal competitiveness of the EU food industry, such differences could indicate that there may be room for further improvement in food supply chain efficiency.

The report also points to the productivity gap with the US in the retail sector,<sup>2</sup> which is attributed to a lower use of information and communication technologies (ICT) in the EU. The remaining segmentation of the European Single Market, illustrated by the diverging price levels and price developments across countries, may also contribute to the lower EU productivity performance. Other causes may be found in differences in the intensity of competition, the regulatory framework and labour market policies, as indicated in analysis of the possible causes of malfunctioning on EU product markets.<sup>3</sup> Labour productivity growth in the three sectors considered here has generally been higher in the new Member States, most likely reflecting catch-up effects from lower initial productivity levels.

#### WEAKNESSES AND STRENGTHS

The overall findings of the report are that the European food industry is weak in economies of scale and in labour productivity. However, it is strong in attracting sufficient capital and labour, is open to the world market (exports and imports grew simultaneously) and is open to competition (large number of enterprises). Furthermore, the cultural differences between EU regions and specialised SMEs enable it to exploit “economies of scope”. New technologies (micro-machine processing and e-Business standards) and consumer preferences for differentiated and healthy products enhance these opportunities.

The influence of EU population growth on the future of the EU food industry was also assessed in the report. The conclusion was drawn that, with low population growth in the EU, the demand curve is shifting upwards more slowly than in other countries. However, the report pointed to the key EU success factors as low cost leadership to gain export share, the chance to provide differentiated products and being an innovator in exploiting new technology. Governments can enhance competitiveness by harmonising the legislation internally and globally by supporting ICT supply management systems and by supporting the implementation of quality standards of worldwide acceptance.

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<sup>1</sup> See “Competitiveness of the European Food Industry. An economic and legal assessment”, 2007, (ENTR/05/75).

<sup>2</sup> It should be noted that these indicators apply to the retail and wholesale sectors as a whole, and may not fully reflect developments in the distribution of food.

<sup>3</sup> See European Economy, Economic Paper no 271 at [http://ec.europa.eu/economy\\_finance/publications/publication\\_summary13085\\_en.htm](http://ec.europa.eu/economy_finance/publications/publication_summary13085_en.htm)

2. *How well placed is the EU to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

The challenges of meeting world food demand by 2050 are significant and should not be underestimated. They relate to factors that affect the supply of food, the demand of food and to a series of uncertainties that are external to agriculture, from climate change to potential impacts from micro-economic shocks or policy changes.

However, these challenges are not unique. What is required for world food production to double by 2050 (from 2005) is essentially a growth rate that is similar to the one achieved during the last 45 years. This requirement is an average one, and averages tend to masque significant differences in the various components. On the demand side it is clear that challenges from population growth are much slower today than the ones the world faced when production doubled from 1960–2005. GDP growth is expected to remain strong in the longer term, despite the significant slowdown we are facing currently with the world economic recession. Large emerging economies, which by 2050 will most likely not be emerging anymore, would certainly shift their pattern of food demands, already their level of GDP indicates that additions in their incomes shift away from food towards other commodities. In summary the two basic components of demand growth are not the ones that present the major challenges.

The major challenges and uncertainties are mainly linked with supply factors. With respect to area, unlike what is commonly believed, both the World Bank and FAO indicate the existence of additional research that is available and could be brought into production with a combination of adequate prices and public/private investment. With a respect to yield growth there are some challenges in certain crops, but there are also positive developments and a rather mixed picture at the regional level. Again prices and investment could help mitigate in the longer term and short term shocks.

However, the real challenges for meeting food production requirements are mainly related to factors outside agriculture. Two areas stand out with respect to uncertainties they induce for food production. The first area relates to the macro-economic environment; income fluctuation, exchange rate variability, credits availability, the overall trade environment are factors that have always played a significant role in agricultural supply and demand response, and will continue to do so in the future. Probably the most important new element in this link in agriculture to macro-economy is the link between agriculture and energy, in addition to the already present and growing problem of competition for production factors (water, land and—in developed countries—labour) with other economic sectors.

The second area relates to the very complex link between agriculture and environment which will be affected by climate change. Agriculture has a characteristic of being a sector that contributes both positively and negatively to the environment. Enhancing the positive environmental externalities stemming from agriculture and minimising the negative ones is becoming a challenge that has taken new dimensions with climate change. How to best contribute to that will clearly be linked to the policy responses that will be given to climate change mitigation and adaptation.

3. *In particular, what are the challenges the EU faces in relation to the following aspects of the supply side of the food system:*

Any future response from EU agriculture to the challenge of sustainable production will rely on a sustainable resource base for its achievement. However, the resource base, in this context, does not solely consist of environmental resources—principally soil, water and farm practices—but also human capital (ie manpower, level of training and knowledge base as research), access to global resources through the medium of trade and investment in terms of farm infrastructure.

Successive reforms of the CAP have strengthened the link between EU agriculture and environmental sustainability through the targeted agri-environmental measures in rural development policy and through cross-compliance with EU environmental legislation under the direct payment regime. The specific measures for soil, water, marine environment and how to encourage ecologically sound ways of farming and managing the land are presented below.

Human capital objectives are embedded in rural development policy in the form of training, broader support to rural communities and investment in research and development. The specific measures for the science base and for vocational training are presented below.

#### SOIL QUALITY

Healthy soils are a prerequisite for sustainable agricultural production. Different EU policies (e.g. water, waste, chemicals, industrial pollution prevention, nature protection, pesticides, agriculture) contribute to soil protection. Owing to differing aims and scopes of action these policies and in order to ensure an adequate level of protection for all soil in Europe, the Commission adopted a Soil Thematic Strategy [COM(2006) 231] and a proposal for a Soil Framework Directive [COM(2006) 232] in 2006, currently under consideration by the other EU Institutions.

## WATER AVAILABILITY

Water availability and quality are critical elements for the future development of EU and world agriculture. While Europe may be considered as having adequate water resources, water scarcity is increasingly frequent in the EU. Long-term imbalances resulting from excess water demand are emerging and further deterioration of the water situation in Europe will occur if temperatures keep rising.

In 2006 and 2007 the Commission made an assessment of water scarcity and droughts in the EU [SEC(2007) 996], followed by an initial set of policy options to increase water efficiency and savings in a Communication [COM(2007) 414 final] in 2007. A follow up report [COM(2008) 875 final] in 2008 summarised progress made on the policy options identified and was accompanied by a work programme, to be part of the 2012 review of the strategy for water scarcity and droughts.

## THE MARINE ENVIRONMENT

The EU's Marine Strategy Framework Directive 2008/56/EC of June 2008 aims to achieve good environmental status of the EU's marine waters by 2021 and protect the resource base for marine-related economic and social activities. The Directive constitutes the environmental component of the EU's future maritime policy. Its goal is in line with the objectives of the 2000 Water Framework Directive 2000, which requires surface freshwater and ground water bodies to be ecologically sound by 2015 in time for a review in 2020.

## THE SCIENCE BASE

In the current knowledge-based approach to economic development, espoused by the Lisbon Strategy, the future of EU agriculture cannot be contemplated without reference to agricultural research policy. A indication of this link was given in December 2008 the Commission adopted the Communication "Towards a coherent strategy for a European Agricultural Research Agenda" [COM(2008) 862 final], which is currently before the other EU Institutions.

The Communication highlights the sources of the key challenges facing EU agriculture: sustainable agricultural practices and production processes responding to consumer concerns; issues related to the need for stable food security and safety systems, environmental and socio-economic challenges, diversification, landscape management and biodiversity; and the demands arising from CAP reform, WTO commitments, the Kyoto protocol and the Convention on Biological Diversity.

The Communication identifies the need for coordinated long-term programming based on a coherent strategy. It describes the role of Standing Committee of Agricultural Research (SCAR) in such work and relates this to the new EU initiative for Joint Programming of research, in which "food and agriculture" has been identified as one of the main issues facing society today.

Attention is given to SCAR's Second Foresight Study, which frames the future of EU agriculture in terms of "crises" (i.e. oil/energy, food, finance, economy), environmental challenges (i.e. climate change, water scarcity, soil erosion, resource depletion) and considers the concepts of "turbulence", "vulnerability" and threatened security, in particular food.

The foresight study argues that there is broad consensus on these issues but points to major disagreements on how to address solutions through trade, new technologies, innovation, energy strategies and agro-food paradigms. Four main themes were developed: green chemistry (biofuels, biomass, energy); environment (climate change, diseases, biodiversity, ecological services); food security (rural areas, structures, competitiveness, urban-rural pattern); and Agricultural Knowledge Systems. The report also identifies two key priority areas for the European Agricultural Research Agenda: climate change and energy and the strengthening of the production and sharing of agricultural knowledge in Europe.

## THE PROVISION OF TRAINING

The future Rural Development policy focuses on three key areas: i) the agrifood economy, ii) the environment and iii) the broader rural economy and population. Policies in the first area should contribute to a strong and dynamic European agrifood sector by focusing on the priorities of knowledge transfer and innovation in the food chain and priority sectors for investment in physical and human capital. Member States should focus support on key actions such as training and information actions aiming at fostering dynamic entrepreneurship. With recent reforms having created a market oriented environment for European farming, this brings new opportunities for farm businesses, which will depend on the development of strategic and organisational skills.

## TRADE BARRIERS

The EU is committed to continuing to promote an open trade policy and working towards a conclusion of the DDA.<sup>4</sup> There are significant potential gains for developing countries from the DDA in terms of new market opportunities, which would help generate export income, stimulate agricultural production and facilitate access to foodstuffs. The EU has already autonomously granted duty and quota free access to least developed countries, an approach now extended to the ACP countries in the framework of the Economic Partnership Agreements (EPAs). The issue of the negative impact of export restrictions should be raised at relevant forthcoming meetings of the WTO and in other relevant international fora.

## THE WAY IN WHICH LAND IS FARMED AND MANAGED

The CAP deals both with the integration of environmental considerations into CAP rules and with the development of agricultural practices preserving the environment and safeguarding the countryside.

With the introduction of decoupling of payments from production many of the incentives to intensive production that have carried increased environmental risk have been eliminated. Beneficiaries of direct payments are obliged to maintain all agricultural land in good agricultural and environmental condition and to comply with statutory EU standards in the field of environment, food safety, and animal health and welfare at farm level (cross-compliance). The European Commission is committed to simplify cross-compliance, withdrawing standards that are not relevant or linked to farmer responsibility. New requirements will be added to retain the environmental benefits of set-aside and improve water management. To help farmers to comply with cross-compliance, the 2003 CAP reform introduced the possibility for Member States to rely on a Farm Advisory System (FAS).

Agri-environmental measures within Rural Development Policy support specifically designed farming practices. Farmers commit themselves, for a five-year minimum period, to adopt environmentally-friendly farming techniques that go beyond usual good agricultural practice. In return they receive payments that compensate for additional costs and loss of income resulting from altered farming practices. These instruments have been strengthened in the context of the Health Check assigning further resources to Pillar II for the programming period 2007–13.

### *4. What trends are likely to emerge on the demand side of the food system in the EU, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

Given the size and stability of the EU population and that food has become a smaller part of the expenditure of households, no major change in demand patterns are foreseen at European level in the short to medium future.

The effects of the current economic crisis will affect demand in the short and medium term but in the longer-term the EU food demand should restore, driven by strong consumption and production of value-added products in the EU-12.

According to the most recent EU agricultural market outlook for 2008–15, demand of higher value-added sectors (the livestock and dairy sectors) will be directly affected by the economic crisis, while the arable crop sector will be indirectly affected through feed demand.

Medium term prospects remain positive for total meat consumption, as per capita consumption is expected to increase. Pig meat would remain the most preferred meat (with a 50% share in per capita consumption), while poultry would increase its share at the expense of beef<sup>5</sup> and sheep meat. Demand for bulk dairy products is foreseen to remain limited in the long-period facing strong competition from lower cost exporters.

Domestic use of cereals in the EU is projected to increase in the long-term thanks to the growth in the emerging bioethanol and biomass industry following the initiatives taken by Member States in the framework of the biofuel directive, the biomass action plan and the renewable energy directive. As regards the oilseed sector, a increasing demand for biodiesel together with a projected stable oilseed production would imply that the EU will continue to remain large net importer of oilseeds in the medium term. However, these projections are subject to a number of uncertainties, which on the demand side are related to the overall macroeconomic environment.

Perception of price, quality, availability and convenience remain central to consumer food choices, although they depend on personal, local and national food cultures, perceptions of pleasure or risk, concerns about health and level of trust in suppliers and products. There is high sensitivity among European consumers towards GMOs and, less significantly, hormone-treated beef. Food safety, prominent from 1980s to 1990s, has been supplemented by broader issues, ranging from health consequences of food to

<sup>4</sup> See the European Commission Communication “Tackling the challenge of rising food prices Directions for EU action” COM(2008) 32.

<sup>5</sup> An unchanged red meat demand in EU is also forecasted for the long-term (2050) in the Interim Report for the STOA Conference “Food for Through: Implications of global trends in eating habits” in the European Parliament, by Agra CEAS consulting, 2009.

environmental consequences of food production. These trends are likely to condition consumption patterns in the future, depending on the divergent approaches to food across EU. At the same time prices will continue having a role in shaping consumption.

The Commission is committed to enforce consumer protection rules enhancing the relevant legislation. Transparency allows better price comparisons for consumers (e.g. Unit Pricing Directive<sup>6</sup>), and can facilitate consumer choice. Misleading commercial practices, which distort consumers' behaviour and actions in a way that turns out detrimental to them (e.g. provision of false information or omission of relevant information) are proscribed by the Unfair Commercial Practices Directive.<sup>7</sup>

As regards to what could be done for local food networks, the Commission is already promoting local productions through the EU labelling schemes PDO (Protected Denomination of Origin) and PGI (Protected Geographical Indication). The PDO logo in particular guarantees that all production steps have been undertaken in the designated area. A green paper on agricultural product quality has been presented last year.<sup>8</sup>

Other initiatives related to the question of locally produced food and food products have been launched recently:

- The proposal to review Directive 2000–13 on labelling<sup>9</sup> opening the debate on whether there should be an indication of the origin of raw materials.
- The proposal to apply the Ecolabel to processed food, fisheries and aquaculture products.<sup>10</sup>

*5. What role should DG AGRI play both in ensuring that the strengths of the eu food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should DG AGRI provide to the food industry?*

The European Commission has taken a series of initiatives since 2008 aimed at improving the functioning of the food supply chain.

A High Level Group on Competitiveness of the Agri-food industry has been set up in June 2008 with the mandate to propose a set of policy recommendations for the short and long-term public policy and regulatory framework. The services of DG AGRI, ENTR, and SANCO have been actively involved into the work of the High Level Group on Competitiveness of the Agri-food industry, which brings together key stakeholders in the food industry (Ministers for industry and/or Agriculture, President or CEO of representatives food companies, associations of stakeholders of the food chain, e.g. Farmers, industry, retailers, consumers).

In the Communication on Food Prices adopted last December,<sup>11</sup> the Commission has proposed a roadmap to improve the functioning of the food supply chain, consisting of four main components:

- (1) Promote the competitiveness of the food supply chain.
- (2) Ensure a vigorous and coherent enforcement of competition and consumer protection rules in the food supply markets at European and National level.
- (3) Review at national and/or EU level, as appropriate, potentially problematic regulations for the functioning of the food supply chain.
- (4) Provide better information to consumers, public authorities and market operators through a permanent European monitoring of food prices and the supply chain.

The Commission will implement in 2009 the roadmap proposed through a joint Task Force involving relevant Directorate Generals (including DG AGRI). This work will feed into a wider analysis of the retail sector in Europe currently conducted by the Commission (the Market Monitoring of the Retail Sector) which should proceed with a review of regulations such as rules on sales below costs, on commercial practices between retailers and suppliers or on opening hours. The final reports for both undertakings are expected end of 2009.

This exercise will allow the Commission to deepen its analysis in order to assess the necessity of reforms of national regulations, if it is established that they restrict business's ability to compete on prices, and to identify potential practices distorting the relationships between suppliers and retailers.<sup>12</sup> In addition, the Commission will continue to ensure, in close cooperation with National Competition Authorities, that all actors involved in the food supply chain will operate in strict compliance with competition rules.

<sup>6</sup> Directive 1998/6/EC.

<sup>7</sup> Directive 2005/29/EC.

<sup>8</sup> Green Paper on agricultural product quality: product standards, farming requirements and quality schemes (COM(2008)641 final).

<sup>9</sup> Proposal for a Regulation of the European Parliament and of the Council on the provision of food information to consumers (COM(2008)40 final).

<sup>10</sup> Proposal for a Regulation of the European Parliament and of the Council on a Community Ecolabel scheme (COM(2008)0401 final).

<sup>11</sup> Communication from the commission "Food prices in Europe" COM(2008)821

<sup>12</sup> The Commission will present the results of this exercise, which is a priority in the Commission's Work Programme for 2009, in November 2009.

Moving ahead in implementing this roadmap will allow to address the lack of transparency providing quality price information, and improve the knowledge of the functioning of the food supply chain. Moreover, it is of particular importance to look further into the distribution of value added across the food supply chain. The asymmetry of bargaining power between agricultural producers and the rest of the supply chain has kept producers margins in the agriculture sector under strong pressure. More clarity on the distribution of value added would be a first step in the direction of rebalancing the bargaining power along the supply chain.

With regard specifically to the future of the CAP, its shape is still to be defined and is linked to the discussion on the EU budget as from 2013 and to WTO negotiations.

The role of the future CAP will be to guarantee food production that is respectful to EU's citizen's demands and is balanced across the territory of the EU. The reform path of the CAP has been already putting greater emphasis on competitiveness, market orientation and production standards, and the balance between the three main policy instruments (i.e. market support as a safety net; farm income support through decoupled payments; adaptation and public goods provision through rural development). In relation to the physical production of food there are four main issues for discussion in the future:

- (1) The need to find a balance between competitiveness and social expectation in relation to the high demand for health and environmental standards.
- (2) The need to adapt the current support (i.e. individual farmer support, fixed in time) to the volatility of markets and the increase of public health and climate-related risk.
- (3) Innovation as one of the aspects of the CAP of tomorrow.
- (4) An efficient CAP which will take into account the diversity of the system of production in the EU and their needs.

*6. How well does DG AGRI engage with other relevant departments across the European Commission, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Institutional food strategy?*

The way in which the EU regulates, in particular how the Commission organizes its internal consultations and engages with other EU institutions, international bodies and stakeholders, has considerable impact on whether objectives regarding economic development, environmental protection and improvement of social standards are met efficiently. In 2001, the Commission launched a comprehensive strategy on Better Regulation,<sup>13</sup> based on the three key action lines:

- Promoting measures for simplification, reduction of administrative burdens and impact assessment, which is a major instrument for structuring and supporting the development of EU policies and all actors in analysis of the implications of policy options across the EU.
- Working more closely with Member States to ensure that better regulation principles are applied consistently throughout the EU by all regulators.
- Reinforcing the constructive dialogue between stakeholders and all regulators at the EU and national levels.

The most complete illustration of this stronger cross-institutional approach in relation to the CAP is the impact assessment accompanying the recent Health Check of the 2003 CAP reform [COM(2008) 1885], which aimed to introduce adjustments that simplify and increase the effectiveness of the policy, allowing it to respond to present market opportunities and face new challenges.

In this context, the preparatory work of the impact assessment on the Health Check has been carried out by an Inter-Service Steering Group (ISG) led by DG AGRI and with active participation of 15 Commission Directorates. A public consultation lasted from 20 November 2007 until the 15 January 2008, and involved a considerable number of contributions mainly originated from national and international NGO's. Two external seminars were organized with the participation of stakeholders (farmers, traders, industry, workers, consumers, environmentalists). The seminars were followed by an intense debate between the stakeholders and the Commission's representatives. The Health Check issues were also discussed with stakeholders within DG AGRI Advisory Committees (e.g. environment, beef meat, cereals etc.). To reinforce the participation of the public, an electronic mailbox was created to receive not only the contributions of the stakeholders but also the personal positions of the EU citizens, along with a webpage on the EUROPA site.

In addition to the above, Commission's representatives participated in meetings held within other EU Institutions where the HC was the topic of the discussions, such as in the European Parliament (COMAGRI, ENVI), the Committee of the Regions and the European Economic and Social Committee.

The High Level Group on Competitiveness of the Agri-food industry has presented recommendations in the area of "Regulatory environment" (food, law, environment policy, customs). In brief, they suggest: continued support for a more market oriented CAP and an EU-policy framework that facilitates sufficient supply of competitively priced raw materials as a way to limit price volatility with the view to achieve

<sup>13</sup> In the context of the White paper on European governance [COM(2001)428]

sustainable growth of the sector; want an environmental and sustainable industrial policy designed to minimize costs and maximize opportunities for the European agro-food industry; ask for the promotion of energy efficiency for the European agro-food industry.

7. *What criteria should DG AGRI use to monitor how well the EU is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

DG AGRI prepares a long-term agriculture outlook, updated twice a year, covering prospects for agricultural markets and income in the European Union. This outlook, together with other existing monitoring instruments in other international organizations have allowed DG AGRI to analyse future developments in EU and world markets, in close co-operation with International Institutions monitoring such developments, especially the OECD and the FAO. This co-operation allows the Commission and DG AGRI to have immediate and full access to all information related to emerging trends, to identify potential changes in the production capacity of the EU and its ability to respond to food challenges, and to propose the necessary policy responses that mitigate potential problems. (The changes introduced in set-aside and in dairy quotas during the spike in commodity prices in 2009 are an example of the impact of this monitoring on policy decisions).

Furthermore, as part of the Commission's commitment to provide better information to consumers, public authorities and market operators on food prices and the supply chain, DG Agriculture has now set up a monthly update on EU and world agricultural commodity and food prices, which can be consulted on the "Agriculture and Rural Development" page of the Europa website.

In the context of the follow-up of the Communication on Food Prices, the Commission intends to carry out further investigation of the functioning of the food chain. Yet, given the scarce availability of data and the high degree of diversity of the food supply chain between Member States, it is not possible at this stage to conduct a full-fledged study for a wide range of food products and for all Member States.

This is why the Commission will attempt to address this issue by assessing the current state of knowledge, research and analysis about the distribution of the value added across the food supply chain for a few key food products (e.g. milk, a meat product and bread) and for some Member States. Such a work could at one and the same time underscore the usefulness of a permanent monitoring tool and the need for a coherent enforcement of competition rules.

In the long-term the criteria to be used for monitoring how well the EU is responding to the challenge of doubling global food production in 2050 is already defined in the Treaty establishing the European Community, namely that Common Agricultural policy shall respond to the following objectives:

- (a) To increase agricultural productivity by promoting technical progress and by ensuring the rational development of agricultural production and the optimum utilisation of the factors of production, in particular labour.
- (b) To ensure a fair standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture.
- (c) To stabilise markets.
- (d) To assure the availability of supplies.
- (e) To ensure that supplies reach consumers at reasonable prices.

March 2009

*Witness:* **Mr Anastassios Haniotis**, Head of Unit, Agricultural Policy Analysis and Perspectives, Directorate-General for Agriculture and Rural Development, gave evidence.

**Q474 Chairman:** Good afternoon ladies and gentleman, can I welcome you to the seventh evidence session for our inquiry into securing food supplies up to 2050, the challenges for the UK. May I particularly welcome Mr Anastassios Haniotis who is the Head of Unit, Agricultural Policy Analysis and Perspectives of the Directorate-General for Agriculture and Rural Development. I hope I have got that impressive title right, but can I particularly thank you for coming here today to see us and for making an input from the Commission's perspective to our inquiry. A number of our witnesses have, if you like, made it very clear that they recognise the European dimension as particularly important in dealing with food security issues. May I also thank you for sending the written

evidence to us; the Committee have also seen the communication on food prices and the Commission's report on the *Common Agricultural Policy and Global Food Security*. I will not promise that we have read every word of it, but we have it available to us for future reference. I would like to just ask when you look back at last year there has been a remarkable what I would call official governmental response to the increases in prices and some supply problems which occurred last year in some of our staple foods, and certainly from the UK standpoint the Government in a number of ways has engaged in this subject, and there is a great deal more renewed interest from the Department of the Environment, Food and Rural Affairs in food. There is a certain urgency about working out policies

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1 April 2009 Mr Anastassios Haniotis

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to address the question of food security. From the Commission's standpoint do you sense there is any urgency from the Commission about responding to this particular challenge?

**Mr Haniotis:** Thank you first of all for the opportunity you gave us to contribute to the deliberations of your Committee and to this inquiry. The Commission, especially the Directorate-General for Agriculture which I represent, has looked very carefully into what situation was developing last year. My unit as you see has the term perspectives in its titles and in reality we look into long term perspectives, although probably not as long as you are identifying right now. One of the things that characterised what happened last year and caught the attention of so many governments around this is the unexpected parallel influence of too many factors. Before one clarifies whether there is a real food security challenge for the future one has to look at all these factors and see which of those were simply conjecture-only and which were more long term factors. From the point of view of those of us that have been doing analysis of markets and looking at the medium and longer term perspectives, what happened between early 2007 and up until, I would say, the end of 2008 is not really explained by the usual type of analysis we have been doing. A lot of the price developments were not linked to developments in agricultural markets but to the very generalised pattern of a commodity price boom that affected many commodities and pulled together agricultural commodities. What was extremely surprising was, first of all, the speed by which all prices tended to increase and then the speed by which prices tended in essence to collapse. From a historical perspective they are still higher than what they have been, with the exception maybe of dairy prices that have been declining very fast. If one looks at the various factors that affected these developments, one thing that is clear is that since the Second World War we have had three major commodity price booms; agriculture is the only sector that has been present in all three. Metals were not in all three and neither was energy. This is an important element to keep in mind because it indicates that if the commodity price boom is over there is going to be some adjustment in agricultural prices—it takes a little bit longer maybe than other sectors, especially because of the very complex linkage of agricultural prices with energy, especially the oil price. We have seen some adjustment of prices downwards and we have seen a very significant supply response in some sectors, and here is where one needs to draw attention to the difference between various sectors. When one looks at the basic food commodities like wheat and rice, with respect to the longer term perspectives there is no real evidence that would indicate we would be running into some food security problems. If you look and update the evolution of agricultural commodities with the 2008 data, for example, you see that in wheat the rate of growth of demand since 1995 has been of the order of 1.4% annually and production has been increasing by 1.8%. That difference is the addition of only one year of production, which was

a record crop last year. If you look at the details, China for example has a very stable level of consumption of wheat and of rice as well, which is one of the factors which is missed in the debate we have. The same thing applies in most commodities, but there are two areas where there have been question marks in the past and they will stay for some years. One concerns maize, because a lot of the growth in maize has been influenced by developments in biofuels, which were not only driven by the mandate of the US mainly in biofuels—it is raising its levels right now—but also by the level of the oil price. There is a certain level of price for petrol that makes it irrelevant whether you have a mandate for biofuels or not; as long as you have the infrastructure there you might use maize to blend it into ethanol, with or without a subsidy or a government policy. So one big question mark about the future is what will happen to this link between agricultural commodities, especially the price of maize, and the price of oil. This is mainly an issue related to macroeconomic developments and the impacts of the current economic crisis will have a lot to do with where the future lies, but we do not have concrete answers to that. The second area where, in the longer term perspective, there are significant question marks is the potential impact of climate change. This is a very long term perspective. Most of the analysis and models from climate change provide results about what the impacts are going to be for the horizon, or sometimes even after 2050. What we are missing is the crucial link between the shorter term and intermediate impacts of climate change and the potential impact on production. What they are trying to do in the Joint Research Centre of the European Commission in Italy is they are working on models that try to link exactly the yield patterns of crops and the potential impact from climate change, and we expect in two or three years to have some results out of this project. What is most important in all these developments is what is the policy response going to be, because when you have so many factors that are unknown it is the type of policy framework that you have and the type of answers that you try to give with this policy framework that will make the biggest impact, and in that particular case for us what is important is to keep in place the three basic elements of our policy with whatever adjustments will happen in the future. First of all there is the ability of our farmers to respond to market signals fast, and in order to do that you need to move away from any product specific support towards support that is more decoupled, as we have done; second, to retain a certain base and a capacity to produce across the European Union; and, third, to provide additional measures for rural development that will help them adjust. I would like to raise only one issue here to stress how important it is to keep this capacity across the European Union. We have had an external study done by universities that looked into scenarios about the future of European agriculture by 2020 and one of the scenarios included the complete abolition of any type of public support for agriculture, from



1 April 2009 Mr Anastassios Haniotis

subsidies to tariffs.<sup>14</sup> The results do not indicate a lower overall level of production; in fact in most sectors production would slightly increase, but what they indicate is more intensive production in some environmentally sensitive and vulnerable regions and land abandonment in what you can call least favoured areas or least competitive regions. Mainly what the policy does, therefore, is provide more of a territorial and environmental balance. Of course, you can always raise questions about what this balance will be in the future, but that is the overall orientation that we have.

**Q475 Chairman:** In terms of the term “food security” does the Commission have a definition of what it is?

**Mr Haniotis:** It depends on the angle by which we ask the question. Food security is a different thing for a country heavily dependent on imports or a developing country than it is for a country that is a net exporter. In the context of the European Union we are at the same time the largest exporter and the largest importer of agricultural products in the world. We have a very diversified mix of agricultural products and we do not have any issues of food security in terms of lack of food; we do not have it today and we do not expect to have it in the future. The question of how we can contribute to what could be perceived as a food security problem in certain parts of the world, essentially in sub-Saharan Africa, is mainly an issue that does not relate so much to the Common Agricultural Policy but to our development policy because this is an area where the countries that do face most of these problems need to develop their production capacity to adjust, and that is where all the efforts of our development policy are going. But to come back to your question, it really depends on the angle we are seeing it, from the angle of the European Union. We do not see a problem of food security in the sense of lack of supply that would meet our internal demands or the level of exports that we have currently.

**Q476 Chairman:** Part of the reason I asked that question was that in the document, *The Common Agricultural Policy and Global Food Security*, reference is made to the world stock situation and the document commented that it has fallen from World War II levels of a year’s food supply to just 57 days in 2007 and 40 days in 2008. From my memory that was more referring to wheat stocks than anything else, but does the fact that you have conducted that piece of analysis suggest that whilst you made proper reference to the development of the Common Agricultural Policy in moving away from the old subsidy system to one where the market determines the farmer’s response, the Commission does have at the back of its mind that there is an issue about the holding of strategic stocks? The old intervention system if you like used to provide you with stocks because that was the way it worked, but if on the other hand you say “I am rather worried that we have got down to a world supply position of 40 days of grain, so what should we do about it”, are

you looking to suggest that there should be, at the level of the Commission, a policy response to such low global levels of stock holdings?

**Mr Haniotis:** Not necessarily. For one thing we have all the observations of one additional year of evidence after this particular report and what we have seen in this particular situation is exactly in the products where we have the surplus drop of stocks we have had the surplus increase in stocks—wheat is a very typical example. There seems to be area available out there in the world that would come back into production provided the right price signal is there. There is still a question mark that I raised before about what happens with maize, but even there there is some recovery in stocks. The issue of strategic stocks mainly relates to the potential contribution to emergencies with respect to major importing countries in the developing world, and there have been ideas around what one could do with strategic stocks. There has been discussion also in the past but the evidence is rather mixed on what one could provide. For us in the longer term the most significant contribution to resolving this issue is to retain the capacity to produce. Provided that this capacity is there if you do have situations where there is a shortage the response will come mainly through higher prices in the market.

**Q477 Chairman:** There are two issues that come out of that. If I have understood you correctly you are not thinking, if you like, under the terms of the current and future CAP of the Commission being what I might describe as the intelligent customer, looking at stock situations and entering from time to time the grain markets to say “We think there should be an increase in strategic stocks so we will actually become a customer of the wheat and other arable crops producing sector and we will create our own strategic stocks if we think that global positions are getting too close for comfort.” That is not a line of thinking.

**Mr Haniotis:** Clearly this is not a line of thinking. In the context of international co-operation international organisations that deal with these issues decide to keep a certain level of stocks for emergency situations and how we are going to contribute to that is a completely different story, but in the current framework or thinking there is no direction in going back to holding public stocks. The cost is extremely high and it would require a complete reversal of our policy towards much higher prices and support than we have today.

**Q478 Chairman:** The European Union played an important role in the FAO conference last year in June in Rome in putting forward some views on the subject of food security. In that context two targets were put forward: one was a 50% increase in production by 2030 on a global basis, doubling by 2050. If for the moment we accept those as reasonable statements of what needs to be done, you were mentioning some work being carried out in Italy; has the European Union done an exercise to work out the potential production of both arable and livestock within the European Union to see,

<sup>14</sup> Study called Scenar 2020.

1 April 2009 Mr Anastassios Haniotis

firstly, in terms of Europe proportionately increasing its production in the light of those two targets could it do it? Secondly, if Europe had to take on more burdens of feeding a greater number of people than, for example, within the European Union—in other words exporting potential surpluses—do we have the agricultural potential to do that if we accepted for the sake of this discussion that those two targets were valid?

**Mr Haniotis:** One should look at this question from the global context first: what does it imply? Roughly whether we increase by 50% by 2030 or 100% by 2050 it implies an annual rate of growth in production in the range of 1.5 to 1.6%. This is more or less what we have done in the last 50 years but that does not imply that we have to do it in the same way as happened in the past. In the future, clearly, the pressure from population growth is going to be much lower than what it has been in the past; this does not necessarily make it easier for some parts of the world, where most of the population will grow, and the production capacity is not that strong, but at a global level the pressure from population growth is much lower than in the past. Second, in terms of the overall growth of GDP, if you just look at the cumulative growth that this would imply for the next 25 years let us say, to go to 2030, and compare it with what happened in the last 25 years, as international organisations like the World Bank and the FAO would indicate many of the emerging economies especially have reached this level of income where the additional growth of GDP is not going to go to food but to other commodities. Again, the problem seems to be more localised in some of the poorest developing countries. When one looks on the supply side there is area available in many parts of the world that could come back into production. Russia and Ukraine have already brought more area in and there are parts of Latin America that could still have area. As we saw last year, with prices high other areas could come into production, but there are some question marks in terms of the yield growth, and in terms of the yield growth again it depends on the type of commodity and it depends on the money that we will spend in terms of agricultural research and development. In the European Union in the context of the new research framework we have there are going to be €2 billion spent over a seven-year span that would look into particular areas of agricultural research. There is much more money spent in the rest of the world but there seems to be a slow-down in agricultural research in the exact countries that would need more if they are to improve their production capacity, and this is a very significant challenge. So it is possible to do it, but it takes continuous monitoring of the situation, it takes a very focused policy of development exactly in the countries that need it more and with respect to the European Union we do believe that we do have the capacity to respond if that were necessary.

**Q479 Chairman:** Can we pursue that because when you use a term like “the European Union would be in a position to respond” it almost suggests that the Commission may want to look at ways in which it

can achieve or influence that response from the production sector, and in the evidence which you kindly sent us on the Common Agricultural Policy you said the following: “The role of the future CAP will be to guarantee food production that is respectful to European Union citizens’ demands and is balanced across the territory of the European Union.” It goes on to describe the pathway that is currently being followed in terms of reform, but the treaty obligation is much more specific about the role of agriculture, it is very much what I would call a command and control treaty obligation, and in the paper you use the words “the future CAP will be to guarantee food production” and yet in the same paragraph you go on to say “The reform path of the CAP has been already putting greater emphasis on competitiveness, market orientation and production standards . . . ” There does seem to be an incompatibility between the use of the word “guarantee” which implies we are going to press the buttons, we are going to tell farmers what to do, we are going to make certain they have enough money to induce this response, and the competitive freer market, let the farmer decide what he is going to do. In the reform package that is coming up in 2013 what is actually going to be the direction if you are going to make this “will be to guarantee” come true?

**Mr Haniotis:** We are going to find the answer to your question, which is a very legitimate one, by looking at what has happened in the path of the reforms we started in 1992 and even the reforms post 2003. We have moved towards this path away from product support towards income support to producers, stronger rural development measures of adjustment, without a significant impact on our capacity to produce. In fact, what we have done is we have allowed our farmers to respond much better to the signals from the market. Maybe the mix of what they produce has changed, the quality clearly has improved if you look at the specific market but the overall level of production has not really been negatively affected by this path of reform, and this is why we believe that the best way to guarantee your capacity to produce does not necessarily mean that you have to guarantee the particular price in a particular product, we have moved away from that. But what you have to guarantee is the ability of land to be available for production for the farmers and that is why we consider that a certain level of income support should remain—although we recognise that there is an open question of how you actually distribute this support within farmers and across Member States—and if a certain fixed level of support is known in advance to the farmers, probably linked more to the provision of public goods in the future, no matter what it is right now, what the farmers can actually do is look at the price signals to decide what exactly they are going to produce, but at the same time be able to accept the increased price variability that they will face in the market because this price variability is going to be a smaller part of their income if they know that something will be coming from public support. That is the type of guarantee we see, a guarantee that is fixed, that does not depend on the command, as you

1 April 2009 Mr Anastassios Haniotis

described it, of what we do but allows them to have a certain comfort that is not only the market signal that will tell them what they will do, they will still have a certain level of support provided to them but it is the market signal that will tell them what exactly to produce.

**Q480 Chairman:** There has been some suggestion that, for example, the French, who have been quite slow in moving to adopt all of the elements of the current reform package rather like the idea that in order to achieve the security you could almost go backwards to a more heavily and centrally subsidised model, the old CAP as opposed to the reformed CAP. If I have got your drift correctly, what you are saying is that you now see the decoupled market-driven form of the Common Agricultural Policy as the platform from which to go forward, is that a fair assessment?

**Mr Haniotis:** This is true and this is what all Member States are doing actually; all Member States are increasing their level of decoupled support. Where we do have some questions still relates to this 8% to 10% of the level of support post 2010–11 that would still be coupled and linked to specific sectors, and most of these questions and issues relate to the area of extensive livestock production because there are certain regions where we do have a big question mark over what will happen if there is no support at all or if the support is only in the form of decoupled payments. There are certain Member States that believe that there are no alternatives in these regions and production will be abandoned, but when it comes to the overall bulk of our production, when it comes to what will happen to cereals for example, or what will happen to the majority of meat production, there is no question that the Member States accept that they will move towards more decoupled support.

**Q481 Chairman:** I am going to bring Paddy Tipping and Anne McIntosh in in a moment, but in terms of the work that you have done so far in indicating that there is more productive potential within Europe's agricultural model, do you believe that the increases in production which may be drawn forward by market signals reflecting greater global demand can be achieved, but not at the expense of sustainability and not at the expense of increasing but in fact decreasing greenhouse gas emissions from the agricultural sector?

**Mr Haniotis:** Yes, we do provided that we have a policy that will have the basic three characteristics I have described before, that is that we will not determine what producers produce—they will determine that—we will determine a level of public support that will be linked to the provision of public goods, which we do to a large extent for rural development, and we will strengthen much more the rural development component. We are doing that already with the Health Check—the additional money that goes to rural development goes to new challenges, specifically to challenges related to

climate change. The way Member States are going to meet this challenge depends a lot on what they produce, what type of emissions they have right now and what type of targets they will have to meet, and this varies a lot from one Member State to the other. There are going to be some Member States that will face significant challenges more than the others. It is a small minority of Member States but the challenges for them are significant. The type of flexibilities they will have and the manner by which other sectors will play a role—because these are non sector specific targets—will determine the final outcome, but we have seen that EU agriculture has reduced the overall level of emissions since 1995 and we do expect that this will continue in the future, and here is where a lot will determine the type of mitigation measures and adjustment measures, and that is why more targeted rural development to meet these objectives and more research and development money going there would play a role.

**Q482 Paddy Tipping:** It would be right to say that the move has been to decouple and to produce public goods, environmental benefits and rural development, but would it not be the case that if there were issues of food security there would be a lot of pressure on the Commission to, say, go back to direct payments, direct subsidies for production?

**Mr Haniotis:** There has been pressure on the Commission to go that way and we have not done it. Our role is to state the facts and indicate that in a situation that is generally very difficult there are pros and cons in doing one or the other policy, and overall what we have seen is that the best way to meet the challenges we have is to stick to the path we have determined and make adjustments. Clearly there are areas where we need to make adjustments but one where we do not think we need to make adjustments is to go back to increasing the level of support for our commodities. We have seen that this does not necessarily mean more production because we have basically the same levels of production as we had before, it means more public expenditure for the accumulation of stocks, which of course you have to find a way of disposing of afterwards, and less market orientation on the part of our farmers. This is a path that more or less everybody agrees right now, but where we do have some pressures is whether we need to go to some form of measure like the counter-cyclical support that American farmers face, but again clearly in our case apart from the budgetary situation where we have a fixed budget and you cannot afford the variability, the fact that only 8 to 10% of our exports are bulk commodities while it is 40% of the Americans' indicates why that is not a path that we need to follow.

**Q483 Paddy Tipping:** What I am saying is that people agree right now, but things may change. I believe there will be an issue in the future with population growth, climate change, fuel rather than food, and there is going to be pressure on food

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 1 April 2009 Mr Anastassios Haniotis
 

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supply. If that happens there will be an argument in the Commission which says you are going the wrong way, if you want to ensure that food supplies are there we need to go back to direct payments.

**Mr Haniotis:** Maybe this situation will arise. The way you describe it, it is one of the possibilities but again one has to base sound policy decisions on the good description of what the facts are and if your challenge for the future is to make sure that the production capacity is there you still have to ask the same question in the future as the one we asked in the past. What is the best way to do that, by determining from the point of view of public administration what producers are going to do or by allowing producers to find that way themselves? In the context of all the analysis that we and others have done—and there is analysis from other international organisations that indicates that—the real question in the European Union is not whether we are going to produce overall because with or without public support we are going to produce, it is how we are going to produce. That is where the regional balance and the environmental balance become extremely important.

**Q484 Miss McIntosh:** Could you just say a few words about the relationship in the whole issue of food security, particularly the environmental aspects, between yourself and the environmental directorate?

**Mr Haniotis:** Yes. What I could also say is that environment is one of the areas of policy of mixed competence. Agriculture is one of the few areas where the Commission has full competence of the policy, with of course the Member States voting and implementing it. When we take any decision nowadays in the European Commission, whoever is the director-general that takes this decision, there has to be an impact assessment that would look into what is actually going to happen, and the best way to explain this relationship, not only with DG Environment but with all the other DGs is to see what happened in the impact assessment of the Health Check, which is a very heavy body of analysis in which 14 directorate-generals in the Commission participated. In the impact assessment group we had they made their comments and they contributed to the final outcome, so once you come up with the conclusions of this analysis, when you make a proposal it also goes through what in our jargon we call the inter-service consultation which is the possibility of all the other directorate-generals to contribute with specific comments. When it comes to agriculture especially, more and more we see that it is not actually a burden, it is an opportunity and it is a requirement to focus on what the environmental aspects of our policy are going to be, because for us sustainability has three components that move together—economic, social and environmental—and you cannot have farms that deliver the public goods if you do not have farms that are there to produce in the first place, but producing is not enough if they do not meet the environmental criteria.

**Q485 Miss McIntosh:** Would you in your division have a view on the impact of any potential water shortages or, conversely, flooding on food security, or would that be environment, in the sense of if going forward there might be a drought in parts of Europe or floods in parts of Europe. Do you have a policy view on what the impact of water and use of water in agricultural production is?

**Mr Haniotis:** This is one of the reasons why we put so much emphasis on trying to get a better grasp of what the potential impacts of climate change are going to be, because one of the biggest question marks we potentially face is the big variability in weather patterns and the shifts in terms of weather patterns within the European Union. In the context of the Health Check and the move for more money going into rural development measures water issues have become very important and that is why we have also introduced it more in the good agricultural and environmental conditions as a requirement. We do not have right now a very clear picture of where exactly the biggest challenges are going to be, except that if you look on the map clearly you see that in the southern part of Europe there is more and more competition for water and there is more and more a need for water monitoring practices that are being introduced which will look into a more longer term perspective about the environmental impacts. Where things are more uncertain is what happens where you do not have too little but maybe too much water. There are always expert responses that we can provide, but it is very unclear where exactly you need to target your policy at this stage.

**Q486 Chairman:** Just to follow up the themes we have been discussing, we have put a lot of focus so far on the agricultural production side, but it just occurs to me that if I asked a very simple question, does the European Union have a food policy, what would the answer be?

**Mr Haniotis:** It has a food policy in terms of providing the necessary sanitary and phytosanitary framework in legislation and it has a food policy in terms of providing the necessary raw materials, so a food industry, and it has a food policy in terms of having a very concrete trade framework that one applies to the food industry. How exactly the food sector in each Member State evolves and develops is mainly an issue of national policies or mixed competence, but when it comes to food safety and when it comes to trade we do have the framework of a common policy.

**Q487 Dr Strang:** The Committee will find what you have said so far most interesting. You will understand obviously as a UK parliamentary committee looking at this in relation to Wales, Northern Ireland and Scotland as well as England we have to think to some extent in terms of production on these islands but we recognise of course that basically all the big policy decisions are taken at the level of Brussels on agriculture and have been for a long time as opposed to here in Westminster. But if I can just talk about the CAP and its development, nobody is talking about going back

1 April 2009 Mr Anastassios Haniotis

to intervention, that is not an issue, as I am sure you will agree—we are not talking about going back to wine lakes and mountains of skim milk powder—but when you say that the decoupled policy makes it more resilient and makes it easier for them to expand, I would like to ask you that in relation to some of the commodities. For example, we have a decline in certain commodities, probably made worse by the devaluation of sterling in due course, but take for example lamb production where obviously, as you may well be aware, the numbers are going down in Scotland and northern England et cetera; it is quite disappointing and obviously it takes time to turn that round. The issue I would suggest to you is what is wrong with production payments? The point about the decoupled payment is that it is a payment that the farmer can invest in anything he likes, whether it is food or agriculture or going on holiday to Bermuda.

**Mr Haniotis:** Two things on that. Starting with the holidays to Bermuda, there is some sort of fear sometimes generated that decoupled support is support for people to put in their pocket and go to Bermuda; if all the farmers were going to do that we would have such a change in land prices that Europe would become the most competitive place in the world. This is not the case, as you know, but the first one that you raise is a real issue but it is an issue that is not so much related to the policy instrument that we have but to long term developments. You mentioned the sheep sector: with the previous type of support we had, whether it was product specific, whether it was partially coupled or fully decoupled, we saw a long term downward trend in the economic productivity of the sheep industry in Europe, and the fact that we have seen the same development, no matter what type of policy instrument we have used, indicates that there are probably different reasons that explain what is happening than actually decoupled support or coupled support. It is not only in this sector but we have seen it not so much in specific sectors but in specific regions. We have seen it in regions where there are few possibilities for farmers to switch to a different type of production and where there is a long term downward trend in the number of farmers employed and the overall economic situation of the sector. That is why for us the best way to respond to that is not to isolate the type of support you give to a farmer and try to believe that coupled or decoupled support will provide the solution, but to link it to what is happening with rural development. This is why rural development in all its three axes is extremely important. Whether these are measures that improve the competitiveness of the specific farm, the agro-environmental contribution of the farm or the overall economy of the region it is extremely important that farmers live in an overall environment that would provide to them the possibility not only to market their products but to also diversify their income coming from this particular sector. It is at least my view that in cases like that we need to focus more specifically on what is the overall situation in the particular region because in the sheep sector we have seen the same

trend whether we have coupled or decoupled support. That probably indicates that there are deeper reasons in these particular areas where we have this development.

**Q488 Dr Strang:** They are interesting statistics and I am sure the farmers are actually investing and they are not likely to be wasting these payments in going on holiday. Just on the general area then of looking at the land area throughout Europe, you still accept the principle of less favoured areas where you have got these higher rates of payment, but on the converse would you have to recognise that there could be a growing need for let us call it intensive agricultural production in certain areas of Europe where in fact we can produce very high yields. Indeed, as you mentioned, you cannot be sure what is going to happen to yield trends in the next 20 years and they will not necessarily follow the same pattern as the last 20 years because an awful lot has to do with the inputs, the fertiliser and the water et cetera.

**Mr Haniotis:** It is not that we do not recognise the need to have agriculture that is more productive, but when we talk about intensive agriculture first of all we always need to be aware of the impact this is going to have on the environment. We are not against intensive agriculture provided that it respects all of the standards that we have set, but second it is very important, especially in the context of European agriculture, to move a little bit away from this tendency that we have sometimes to link productivity growth with growth in yields because you can have the same level of yields with lower input use and that increases overall productivity, so it is a much more complex and mixed area. For example, in wheat we still have a significant part of our wheat that goes to animal feed, but if we want to improve the quality of wheat that goes to food that does not necessarily mean an increase in the overall yields which are extremely high by world standards, so one has to look at the specific situation in various sectors. We are for very competitive agriculture and we do not believe that intensive agriculture is necessarily one that creates problems, but what we think is that the overall framework should be one where we respect the standards that we have set.

**Q489 Dr Strang:** You could say that if you can get the production out of certain areas which are well-informed, with good science, high fertility, then it means you can perhaps be more environmentally conscious in some of the other parts of your country.

**Mr Haniotis:** We do not see a false dilemma in that only small producers that are very extensive should be able to cover our needs. Big producers are very competitive and should also and already do a lot of this.

**Q490 Lynne Jones:** Can I pick up on what you were saying about animals? In your submission you mention that pig-meat would remain the most preferred meat with a 50% share while poultry would increase its share at the expense of beef and sheep. Is there not an issue here about a move from extensive largely perhaps grass-fed meat production to more

1 April 2009 Mr Anastassios Haniotis

intensive meat production that depends upon cereals and crops like soya? Is that not something that would concern DG Agriculture if we are concerned about environmental issues?

**Mr Haniotis:** First of all the type of demand patterns that we describe there are the ones we have seen developing in the past, not only in Europe but also in the rest of the world and we do not expect that we have the power or even the will to change what consumers will demand. A lot of the increasing pork and especially poultry production and consumption has to do with the fact that people tend to eat more away from home and sometimes eat rather fast, so that explains a lot of it. When it comes to what you mentioned about more intensive versus extensive, first of all in the beef sector we have also the situation of beef coming from the extensive sector and also beef that is produced intensively, not so much in Europe but in other parts of the world, so there is an issue there. What is very important is also if you look at the pattern of developments even in the pork and poultry industries, pork and poultry production has to meet the higher standards that we have introduced right now that imply first of all a less intensive method of production than before and also a better efficiency in the conversion of cereals into meat. It is a development that would continue the path we have seen in the past but does not necessarily imply more environmental pressures than we have seen, especially because of the type of standards that have to be met, and it is also one that overall in Europe does not seem to put enormous pressure on the environment with respect to the previous trends. There is a slowing down in the growth patterns compared with what we have seen in the past.

**Q491 Lynne Jones:** But a lot of the way we have been discussing these issues today has been based on food security within Europe and you said, if you like, that food security globally was a matter for development policy not a matter for agricultural policy. But with Europe being a temperate climate with good agricultural production do we not have a responsibility to maximise the productivity of our land to contribute towards global security of food and not just see it in terms of our own security?

**Mr Haniotis:** We do have this obligation to maximise our productivity given the constraints we have, and the constraints we have with respect to the environment in Europe are more demanding than the rest of the world, not only because our standards are higher but also because we are a very densely populated part of the world compared to other parts of the world. That is what makes a difference between our capacity to respond to those types of needs compared to the capacity to respond of other parts of the world, and when we talk about food security in the context of what the developing countries would require most of the time we are not talking about what they would import in terms of meat, it is mainly what they would import in terms of grains and that is where the big questions are being asked. In terms of meat, for example, if you look at the overall trends of demand they have not been as impressive as you would tend to see in newspapers,

in the media, when you look at the numbers, and what has been much more impressive is the supply response which is higher than the demand and most of it is coming actually from Brazil.

**Q492 Lynne Jones:** But with climate change we are going to be in a different scenario, are we not, because it is going to become more difficult for that marginal land to produce its own and therefore if we are using our grain production to feed animals for our food that does mean that there is less cereal and grain available to export?

**Mr Haniotis:** If we are going to see a shift towards intensive production of livestock, yes, but most of the increase in beef production, for example, if not all, is coming from extensive pasture-based beef all over the world.

**Q493 Lynne Jones:** But you said there is going to be a reduction in that kind of production and an increase in pork and poultry.

**Mr Haniotis:** In Europe there is going to be a reduction but not in Brazil and Argentina where it is also based on extensive methods mainly when it comes to beef.

**Q494 Lynne Jones:** I am talking about Europe here.

**Mr Haniotis:** If I may add here do not forget that the overall pattern of food demand for cereals in Europe is going down, so the additional feed demand could be covered for pork and poultry from what we produce internally.

**Q495 Lynne Jones:** You also said earlier that yield improvements would depend on research and development, so can you explain to us how research into food and farming works at the EU level?

**Mr Haniotis:** Research is an area where we have contributions both from the Community but also from Member States and the private sector, so it is an area where there is an array of projects going on that is simply too long to list and I would not even know most of them. There are three broad areas that we are focusing on right now in this research and development project that I mentioned before at the community level with €2 billion over the next seven years.

**Q496 Lynne Jones:** Is that an increase?

**Mr Haniotis:** Yes, that is an increase.

**Q497 Lynne Jones:** From what?

**Mr Haniotis:** It is hard to say simply because in the past what we were doing in agriculture was part of two programmes of the overall package;<sup>15</sup> this time around with the seventh research framework agriculture is a part of a specific priority<sup>16</sup> so you can see clearly what goes to agricultural development and that is 4% of the overall budget, whereas in the past there were too many projects lumped together. There are three broad areas: one is food farm management with a focus on increased

<sup>15</sup> *Witness amendment:* Namely: Food quality and safety; and Sustainable development, global change and ecosystems.

<sup>16</sup> *Witness amendment:* Food, agriculture and biotechnology.

1 April 2009 Mr Anastassios Haniotis

competitiveness, the second area relates to rural development with an objective to improve the sustainability of our agricultural sector, and the third area is the area of food safety with the objective of meeting the requirements and the demands of European citizens. These are the three broad areas where we have dozens and dozens of projects that cover these broad areas from different angles. If you want we can provide you with a detailed list of these particular projects and which areas they cover—in fact, we follow this in my unit and we can send you this list.

**Q498 Chairman:** Are those programmes complementary to the research programmes that Member States are carrying out?

**Mr Haniotis:** Yes, in fact most of the research in agricultural areas is not coming from the European Union, it is coming from the Member States.

**Q499 Lynne Jones:** You said that there had been a slowdown in research in those countries that needed it most; you were talking about countries outside the EU there.

**Mr Haniotis:** Yes, if you look at the pattern of agricultural research and development in the last three decades—and I am familiar with a graph coming from the World Bank—it is mainly in sub-Saharan Africa that they have had clearly a decline in agricultural research and development. There was a decline in the 1980s in almost all parts of the world but research expenditure picked up in the 1990s in most parts of the world, especially in the developed world, but this is not the case in sub-Saharan Africa and also there are some developing countries in South East Asia that could do with more research.

**Q500 Lynne Jones:** We have had a lot of evidence that certainly in the UK but also in other European countries their own expenditure on agricultural research has been in decline. Are you saying that is not the case?

**Mr Haniotis:** In terms of public research this is true but if you put together public and private research, at least based on the figures I have seen from the World Bank, that did not seem to be exactly the case. We are not talking about any impressive increases in the developed world, but it seems that private research tended to cover part of what was going on in public research.

**Q501 Lynne Jones:** The private research would be near market.

**Mr Haniotis:** Part of the problem is that the focus of private research is different than the focus of public research because the private research will take place exactly where the sector involved with the provision of inputs in agriculture sees more immediate possibility to get some profits. This is why they are in business. Public research tends to cover areas where the potential to reach a level where you make a new product profitable is much longer term, and this is why in Europe we still need to focus on what is happening in public research.

**Q502 Lynne Jones:** Do you have any views on the ability of the private sector to translate the basic research that is done in the public sector into agricultural production?

**Mr Haniotis:** No, I could look to see if we could provide you with any information or analysis that has been done but this is not an area that I know.

**Q503 Lynne Jones:** Because we have had concerns about the balance between basic and applied research, so you have big company research where they can make a big profit but where it is more marginal there is not the kind of development research or translational research from the public sector investment.

**Mr Haniotis:** I have only a general overview of what I mentioned before, but if you want we can look and find out what specific information there is in terms of analysis done under the European Commission.

**Chairman:** It would be very useful to have an indication of the principal areas of research work which the Commission is funding so that we can compare it with some of the research activities we have seen here in England.

**Q504 Lynne Jones:** And how you are helping food and farming to actually make use of public research, and also how you assess the projects that bid for funding for agricultural research and their prioritisation. One submission that we have had—in fact probably more than one—has been commenting on the negative attitude in Europe towards science and technology and that that was risking undermining the productivity of European farmers. How would you respond to that?

**Mr Haniotis:** What we have seen is what everybody has seen in terms of the responses, mainly for European citizens in various surveys. I am not sure that one could say that there is a negative attitude towards technology in general but there is a clear mixed feeling when it comes to the agricultural applications of biotechnology. I am talking only about the agricultural ones because the medical ones do not seem to have the same problem. I do not think there is anything new here in the last few years because still the issue seems to be related to the fact that the products that come out do not have immediate benefits that are evident to the final consumer. There are some clear benefits to be demonstrated at least in some parts of the world to producers but when it comes to what the consumer can get out of it, it is not as clear, and that is the explanation we can try to give on why there is still hesitation in a significant part of the European public about the implications of mainly biotechnology, but I would not say that this applies generally to technology.

**Q505 Lynne Jones:** It is something though that is not just a reaction from consumers, it is also promoted. For example, the response of the Foreign Affairs Committee to the Agricultural Committee was that the policy must not lead to an environmentally less-sensitive stance on the use of GM food. There does seem to be a very negative response towards GM

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 1 April 2009 Mr Anastassios Haniotis
 

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technology. I understand the point you are making that because our position is relatively secure in relation to our food supply we do not see the need, but there does seem to be a negative reaction beyond that to biotechnology. Could you describe the EU approval system for both the importation of GMOs and the cultivation of GMOs?

**Mr Haniotis:** It is a system that is based on science. There is an independent agency that does all the analysis and the assessment and evaluation and when and only if a particular product is considered to be safe, both for the environment and the consumer, then the Commission makes a proposal for its approval. As you know, this approval has to receive the qualified majority of the Member States in various steps and if this is not forthcoming then it is not approved. We have had approvals of GMOs where there is still some resistance in Member States to apply it. The problem in the European Union is not so much the approval process because the approval process has improved and is based on an independent scientific assessment and the possibility for all the stakeholders to comment throughout this process on what is about to happen. The problem continues to remain one of acceptance in the eyes of the wider public of the benefits stemming out of these particular applications.

**Q506 Chairman:** Forgive me interrupting just for a second but I want to be clear. You have made it very clear in two answers that the attitude of the Commission and the Member States is conditioned by their understanding that consumers at the moment do not particularly want this technology, but earlier you made it very clear that the production of agricultural products was to reflect the producer's understanding of what the marketplace wanted. Should not the answer be that if the farmer wants to try and grow it he ought to be allowed to, unless there is a very good safety or technical reason not to do it, but then he is taking or she is taking the commercial risk as to whether it is saleable. The way you have described it is that you are saying that consumers cannot see the benefit to consumers so that is why there is not going to be a speedy approvals process to say "You at the production end, oh farmer, can have this".

**Mr Haniotis:** I would like to clarify that these are two separate issues. When it comes to the approval process we do not take into account the attitude of the general public but we take into account what the scientific evaluation says. Is it safe for the environment, is it safe for the consumer, and it is on this basis that we make a proposal for the acceptance of GMOs in the European Commission. That is the process. What actually happens in practice depends a lot on the manner by which producers among others assess the saleability of these particular products, and I believe that in the context of agriculture in Europe it is mainly agriculture that is value added and it is very sensitive to what consumer demands are because of all the experiences we have had since the mid-1990s. Producers do take this into account and that is why we have not seen in Europe a very significant split in the opinion between what

the wider public wants and the producers, although clearly farmers are mainly very positive about the potential of these applications. This is and continues to be a very complex issue in which we from the Directorate General of Agriculture are basically observers of the overall trends. Our strong point as the Commission is that this approval procedure has to be based on science and has to respect the rules we have in place. The wider acceptance however of a product is not something that you can force upon consumers or the wider public, and that is the reality we have been facing in Europe.

**Q507 Lynne Jones:** The Commission recently put forward two genetically modified maize varieties and these were turned down by the regulatory committee on 20 February. Are you saying that those refusals were based on scientific grounds?

**Mr Haniotis:** I cannot answer this specific question because we do not follow in the DG Agri all the details of that committee.<sup>17</sup> I can find out the details, but all I know is that I am pretty sure that when the Commission made a proposal it was very confident about the scientific grounds for that.

**Q508 Lynne Jones:** The Commission made a proposal recommending approval based on scientific assessment, and yet it was turned down by the regulatory committee. What happens next?

**Mr Haniotis:** The Commission has the possibility to go to the Council and ask the Member States and the Member States will then have to take a decision. This is one of those cases where the roles of the various institutions are pretty clearly defined. As a Commission we have the role to make a proposal; the Member States have the role to decide on the basis of this proposal.

**Q509 Chairman:** Let me just probe a little bit further about where the Commission stands on this technology because you have made it very clear that on an application by application basis you adjudge the scientific evidence, but it has been suggested to us that, for example, as the cost of nitrogen fertiliser is likely to rise over the next two decades then either you have got to move to better application of organic techniques or you have got to go down the route of genetic modification, for example, to improve the way that certain plant species can fix their own nitrogen.

**Lynne Jones:** Or a combination.

**Q510 Chairman:** Or a combination of the two. First of all does the Commission recognise that there may be certain agricultural challenges that lie ahead, such as the example that I have just given, that will require science to provide a response and one of those responses could be the use of genetically modified organisms. In other words do you think that the

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<sup>17</sup> *Witness amendment:* Sentence to read: I cannot answer this specific question because other services in DG AGRI follow all the details of that committee.



1 April 2009 Mr Anastassios Haniotis

technology might have an application in dealing with the challenge as to how Europe's agriculture responds to the demand for greater output over the kind of timescales that the two FAO targets currently suggest?

**Mr Haniotis:** Yes, we do consider that it has a role to play in that; that is not something that we have hidden, but that is part of an overall technological approach that has to take into account the specific challenges in each one of the sectors. By training I am an ag-economist and also a pure scientist if you like, so I would be very glad to try to find any additional information and research in this particular area, especially in areas where we do believe that this should be the case, but we do not have any attitude that says there are certain parts of technology that are more or less appropriate than others, it is a case by case issue. What we want to make sure is that the standards that have to be met are all based on science and go through the same procedure.

**Q511 Lynne Jones:** Can you tell us about the Sherpa initiative? It was set up by President Barroso in June 2008.

**Mr Haniotis:** On biotechnology?

**Q512 Lynne Jones:** It was an invitation to Member States to nominate a senior official to "represent the overall view of your government" and take part in a discussion on the way we implement legislation on approval of GMOs.

**Mr Haniotis:** If you want I will ask the relevant competent service of the Commission to send you that information.

**Q513 Dr Strang:** Still on agricultural science you indicated that there were three headings which your part of the Commission has in relation to research at this time and what you are spending your money on, and you listed these as competitiveness, rural development and food safety. Thinking about competitiveness, just as a quick question, that includes production does it?

**Mr Haniotis:** Yes.

**Q514 Dr Strang:** You have also explained that if you look at the world you believe that the biggest decline in research is outside the European Union—and we are now talking particularly about public sector research which tends to be more long term, some applied and some relatively pure. At the present time within your budget you are giving grants and putting money into a range of research institutes throughout the European Union, is that fair?

**Mr Haniotis:** Yes.

**Q515 Dr Strang:** That is correct, that is what is happening around town. These research institutes must have a tremendous capability, whether it is on the veterinary side, the crop production side or the soil science side, to help and encourage and work

with researchers in these countries outwith Europe—perhaps Africa or elsewhere. The question I have is I take it that in terms of achieving that objective—and I know obviously it is going on at the moment—it would be fair to say that that is not in your area, you would see that in the Commission as a separate department and the money for that should come from the development budget, would that be fair, the overseas aid budget?

**Mr Haniotis:** Yes. The projects that I mentioned before are projects that relate mainly to research priorities in the context of the European Union and it is based not on what we propose in terms of specific areas, which are set up, it is the researchers that bid for specific projects and there is an independent procedure of evaluating and assessing which ones should be accepted and which not. When it comes to supportive research that relates to other countries of the world, especially developing countries, it is the development budget that will deal with that.<sup>18</sup>

**Q516 David Lepper:** Can I ask about the Pesticides Directive because we have had a number of representations made to us during the course of this inquiry expressing concern about the possible implications of that directive. I appreciate the fact that the Council still has to make a decision to adopt the directive, but if I could just give you one example the Fresh Produce Consortium told us that it could "jeopardise the ability of European horticulture to supply good quality affordable produce in a safe sustainable manner",<sup>19</sup> and the underlying concern that has been expressed to us is that it is a sign of the Commission moving from risk-based criteria in making assessments to hazard-based criteria. Is that something which has consciously happened?

**Mr Haniotis:** First of all I am not able to respond on the type of approach because this was mainly from DG Environment but what we have done in DG Agri—because we have received the same types of worries and concerns you have received—is we have looked into how this assessment was done and basically what we do have in front of us here is a situation that is not unlike what has happened in the past. There are many substances in the past in the area of pesticides and other chemical inputs in agriculture that for various reasons have been determined to be detrimental for human health or for the environment, and they have gradually been phased out. We have in the past faced similar challenges and agriculture adjusted and adapted, and the assessment we have, without going into every single detail, is that this is a similar challenge that we face right now. A lot depends on what the final decision is going to be, what the phasing out

<sup>18</sup> *Witness amendment:* Sentence to read: Beyond the specific research actions third country partners may join in, which have increased in importance under the seventh framework programme, when it comes to support that relates to other countries of the world, especially developing countries, the development budget is still most important in dealing with that.

<sup>19</sup> SFS 54, paragraph 18

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1 April 2009 Mr Anastassios Haniotis

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period is going to be, and of course what additional research would be done or what the products of the current research are going to be to allow farmers to adapt to this new situation. Clearly this is not a guarantee that things will go on like that in the future, but in the past on many occasions when we had similar situations we have had the same type of responses and we have seen that agriculture did adapt and the final outcome was a better one actually, because here what we are talking about are substances that have, on the basis of scientific research, been proven to have an element not just of hazard but risk as well.

**Q517 David Lepper:** Thank you for that, but I suppose one concern that we have certainly had expressed to us is that the substance may be one which is dangerous, but a lot depends on the dose of the substance when applied and what seems to be happening is a far more precautionary view of things than is necessarily reflected in the reality of the use of some of those substances in dealing with pests that affect crops.

**Mr Haniotis:** Yes, but this is again one of these issues where either we accept that an independent scientific assessment is being done or we assess it ourselves differently or not.

**Q518 David Lepper:** I take your point that they are issues to do with the DG Environment perhaps rather than DG Agriculture but has the Commission made any assessment of the proportion of pesticides that, if the directive is adopted, will be affected and will no longer be possible to use, because we have seen some conflicting evidence about that. The UK Pesticides Safety Directorate says it could put a ban on 23% of the sprays currently being used whereas the Commission only says 4%. There is a big difference there and I wonder whether you are aware of what assessment has been made of that and how that assessment was carried out?

**Mr Haniotis:** I do not know the results of this assessment. I know there has been an assessment and I will be glad to provide this information for you.

**Q519 Chairman:** Were you, from the Agricultural Directorate, asked to inform DG Environment of the possible impacts of the removal of certain types of agrochemical on the ability of Europe's farmers to produce?

**Mr Haniotis:** Other colleagues of mine in other parts of DG Agri have followed the impact assessment and were part of the group that prepared it, so it is not a matter of whether we are asked from the outside, we are formally asked internally in the procedure to look at the potential impact.

**Q520 Chairman:** Would I be right in saying that effectively you have not come to a view that the application of the Pesticides Directive as currently imposed would have a long term harmful effect on the ability of Europe's agriculture to meet the kind of output increases that we referred to earlier?

**Mr Haniotis:** No, we have not come to this conclusion.

**Q521 Chairman:** I just want to go back to one subject before we close. We saw some examples in certain countries when we had the commodity price spike and supply problems that we discussed earlier of taking action, for example in the case of Argentina, not to export any of their grain products, and there were various sorts of tactics taken by various countries to defend their own agricultural interests. If we were in a situation where, for example, in Europe there was a major crop failure and Member States started to take highly protectionist action which was contrary to the requirements of the single market, is the Commission of a view that it would ensure that those barriers to the free movement of what agricultural goods remained in the Community were sustained, they were kept in operation; in other words that you could not at times of difficulty see Member States protecting their own and not bothering about their wider responsibilities?

**Mr Haniotis:** This is our role and our obligation to make sure that the rules that we have, which include the single market, are respected.

**Q522 Chairman:** Good. Mr Haniotis, thank you very much indeed for your very clear and well-stated evidence and for the various papers that you have submitted. It has given us an extremely valuable insight to the European dimension of this because clearly in terms of UK agricultural policy and food policy it has to be seen in the context of our European obligations, and for that we are very grateful indeed for you coming this afternoon to talk to us, for providing us with the information you have and also for the further facts that you are going to send to us. Thank you very much.

**Mr Haniotis:** Thank you.

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#### Supplementary memorandum submitted by the European Commission (SFS 78a)

Replies to supplementary questions for further information requested by the EFRA Committee.

THE PRINCIPAL AREAS OF FOOD AND FARMING-RELATED RESEARCH THAT THE COMMISSION IS FUNDING, AND THE BALANCE BETWEEN BASIC AND APPLIED RESEARCH IN THESE AREAS

[This reply relates to information requested in the context of Question 503 of the oral evidence]

The current Community policy on research is embodied in the 7th Framework Programme for Research and Technological Development (2007–2013). FP7, designed to respond to the competitiveness and employment needs of the EU, is organised in four specific programmes: Cooperation, Ideas, People and Capacities.

While a strict division between “basic” and “applied” research is not made, the specific programmes on “Ideas”, “People” and “Capacities” relate more generally to fundamental science, mobility of researchers and large-scale infrastructures, while the “Cooperation” programme, divided in 9 themes, deals with solving societal problems through research projects.

The Cooperation programme aims to gain European leadership in key areas through co-operation of industry and research institutions. The 9 thematic priorities are operationally autonomous and at the same time demonstrate coherence and consistency, allowing for joint, cross-thematic approaches to research subjects of common interest. They reflect the most important fields of knowledge and technology where research excellence is particularly important to improve Europe’s ability to address its social, economic, public health, environmental and industrial challenges of the future.

“Food, agriculture and biotechnology” are the subject of a thematic priority, specifically devoted to the technological challenges facing European agriculture. It covers farm-management policies, food safety, and rural development. Through a multi-disciplinary approach it aims to meet the following challenges:

- Maintaining competitiveness: Research can have a significant influence on Europe’s economic performance and trading position by providing pertinent information and analysis tools to stakeholders and policy makers. In that framework, research seeks to provide sustainable solutions in taking into account of both economic and environmental impacts and needs.
- Managing and using resources in a sustainable manner: Research aims to strengthen the performance of bio-based industries by pulling together the skills and knowledge of various scientific disciplines. Research projects aim to find solutions to problems or discover new, more efficient production methods. While meeting current and future market needs, the answers must also take account of global and local environmental needs.
- Meeting consumer demands and needs: Research focuses on delivery of high—quality products that meet market requirements but that are also safe for use by the consumer and kind to the environment.

The specific breakdown of each research activity and area within the programme is:

*Activity 2.1: Sustainable production and management of biological resources from land, forest and aquatic environments*

Area 2.1.1 Enabling Research

Area 2.1.2 Increased sustainability of all production systems (agriculture, forestry, fisheries and aquaculture); Plant health and crop protection

Area 2.1.3 Optimised animal health, production and welfare across agriculture, fisheries and aquaculture

Area 2.1.4 Socio-economic research and support to policies

*Activity 2.2: Fork to farm: Food (including seafood), health and well being*

Area 2.2.1 Consumers

Area 2.2.2 Nutrition

Area 2.2.3 Food processing

Area 2.2.4 Food quality and safety

Area 2.2.5 Environmental impacts and total food chain

*Activity 2.3: Life Sciences, biotechnology and biochemistry for sustainable non—food products and processes*

Area 2.3.1 Improved biomass and plant based renewables

Area 2.3.2 Bioprocesses

Area 2.3.3 Environmental biotechnologies; Use of waste and by-products

The specific programme “Cooperation” receives EUR 32.41 billion over the 7-year period 2007–13 of FP7 (ie EUR 4.63 billion per year), which is 64% of the total for FP7.

In the specific programme “Cooperation, the thematic priority “Food, agriculture and biotechnology” receives EUR 1.94 billion over the 7-year period 2007–13 of FP7 (ie EUR 276 million per year), which is 6% of the “Cooperation” programme and 4% of the total for FP7.

## 2. WHETHER THE COMMISSION FUNDS ANY TRANSLATIONAL SERVICES, TO HELP THE FARMING AND FOOD INDUSTRIES TO MAKE PRACTICAL USE OF THE RESEARCH THAT IS TAKING PLACE

[This reply relates to information requested in the context of Question 502 of the oral evidence]

The dissemination and transfer of knowledge is a key added value of European research actions, and consortia are obliged to propose appropriate measures to increase the use of results by industry, policy makers and society.

Strengthening the competitiveness of the European food, agriculture, fisheries and biotechnology sectors is an important objective, with particular attention being given to innovation aspects and broad participation of SMEs. Innovation-related aspects need to be clearly addressed and well-defined dissemination and exploitation plans presented, showing the optimal use of project results.

Dissemination is considered an integral task of each project and consortia are encouraged to involve all relevant stakeholders (e.g. consumer organisations, farmers, cooperatives, animal welfare organisations, ethicists, lawyers) in research projects from the beginning of a proposal and actively engage in public dialogue. It will provide at the European level a bottom-up approach to help the process of consensus-forming around the development and use of new scientific and technological developments.

All Commission funded projects therefore have minimum requirements regarding the dissemination and use and access rights to results. The potential impact through the development, dissemination and use of project results is an essential evaluation criterion for selection of each project. Only those projects will be successful in the selection process which can clearly demonstrate their expected impacts and convincing plans for the dissemination and exploitations of results. Publication of results is also dealt with as a horizontal issue with the framework programme and FP7 assigns specific funding for the holding of conferences on topics of broader societal interest.

Beyond the activities and outcomes of collaborative research projects seeking “new knowledge, within the agriculture work programme a number of topics specifically address knowledge transfer and dissemination activities and activities aimed at engagement of the public.

In the context of building the “European Research Area” other specific actions address the need to foster co-ordination of research between Member States, which stimulates the free movement of knowledge within the EU. This particular area of work is overseen by the Standing Committee for Agricultural Research (SCAR), composed of the Member States and the Commission, represented by DG RTD and DG AGRI.

## 3. THE COMMISSION’S PRIORITIES FOR FOOD AND FARMING-RELATED RESEARCH

[This reply relates to information requested in the context of Question 504 of the oral evidence]

Beyond the three main priority areas for research in the “Food, agriculture and biotechnology” theme of FP7 indicated above, a key activity of SCAR is its “Foresight Mechanism”, which recently resulted in a Second Foresight Study.

This study analysed future of EU agriculture from the point of view of possible “crises” (i.e. oil/energy, food, finance, economy), environmental challenges (i.e. climate change, water scarcity, soil erosion, resource depletion) and considered the concepts of “turbulence”, “vulnerability” and threatened security, in particular relating to food.

The foresight study argued that there is broad consensus on these issues but points to major disagreements on how to address solutions through trade, new technologies, innovation, energy strategies and agro-food paradigms.

Four main themes were developed: green chemistry (biofuels, biomass, energy); environment (climate change, diseases, biodiversity, ecological services); food security (rural areas, structures, competitiveness, urban-rural pattern); and Agricultural Knowledge Systems.

The study concluded that there are two key emerging priority areas for the European Agricultural Research Agenda: climate change and energy; and the strengthening of the production and sharing of agricultural knowledge in Europe.

## 4. THE PROCESS THAT HAS BEEN GONE THROUGH SO FAR FOR THE TWO GENETICALLY MODIFIED (GM) MAIZE CROPS THAT ARE CURRENTLY BEING PROPOSED FOR EUROPEAN CULTIVATION

[This reply relates to information requested in the context of Question 507 of the oral evidence]

After having received positive opinions of European Food and Safety Agency (EFSA) on the safety of the two GM maize for health and environment, the Commission has proposed two draft decisions to the MS for the authorisation of Bt11 and 1507 at the meeting of the regulatory committee of 25 February 2009. As the regulatory committee failed to deliver an opinion with qualified majority, the Commission will refer the two files to the Council. If the Council is not able to take its responsibility and decide on the authorisation of these products, the Commission will have to take a decision.

## 5. THE COMMISSION'S VIEW ON THE POTENTIAL OF GM TECHNOLOGY TO MAKE A CONTRIBUTION TO SECURING FOOD SUPPLIES

[This reply relates to information requested in the context of Question 510 of the oral evidence]

New crop varieties, improved cropping systems, more efficient use of water, and greater resistance to diseases and environmental stress are amongst the ways forward to put global agriculture on a sustainable footing. In that context, the Commission will maintain an open but vigilant policy on genetically modified organisms (GMOs). GMOs may offer the potential of crops with higher resistance to droughts, to saline soils or producing “tailor made” oils for the food industry. Thus, at last month’s annual conference of the Victorian Farmers’ Federation Grains Council promising preliminary results of 2007–08 were presented showing that yields of drought-tolerant GM wheat were up to 20% higher than yields of non-GM wheat under drought stress. If the results are confirmed during the following trials, drought-tolerant GM wheat could represent an important contribution to meeting the threat of more frequent droughts due to climate change and the growing annual demand for wheat. This is one example how GM technology could contribute in the future to the security of food supplies.

## 6. THE SHERPA INITIATIVE (IN RELATION TO GM)

[This reply relates to information requested in the context of Question 511 and 512 of the oral evidence]

Last year, the Commission asked representatives of Heads of Government to discuss with the Commission in order to ensure that all the issues of the GMO file would be taken into account. This high-level group met on 17 July 2008 and on 10 October 2008. The main conclusions were that:

- Europe has the strictest GMO legislation in the world but does not make full use of it.
- The time lag in approvals between the EU and other countries represents a threat to EU agriculture.
- There is a need to accelerate procedures within the current rules.
- There is a widespread confirmation of trust in EFSA and the science-based approach as the basis for the EU decision making process.
- The Commission should continue to work on a technical solution for low level presence of non approved GMOs in imported food and feedstuffs.
- On cultivation, decisions could be taken quicker without compromising safety and with paying special attention to the protection of biodiversity on a case-by-case basis.
- Public feels ill informed about GMO and there is a need to enlarge the debate.

No decision has been taken on possible future meeting of this informal group or on possible discussions with Heads of Government.

## 7. WHAT ASSESSMENT THE COMMISSION HAS CARRIED OUT TO DETERMINE HOW MANY PESTICIDES WILL BE BANNED UNDER THE NEW, HAZARD-BASED CRITERIA AND THE IMPACT THIS WILL HAVE ON EU AGRICULTURE

[This reply relates to information requested in the context of Question 518 of the oral evidence]

The Commission presented its proposal for a Regulation of the European Parliament and the Council concerning the placing of plant protection products on the market after a broad consultation of stakeholders as well as an impact assessment concentrated on the main differences of the proposed Regulation compared to the current legislation: provisional authorisations, mutual recognition, comparative assessment, data protection and information of neighbours on the use of plant protection products.

The new Regulation might lead to the withdrawal of a limited number of active substances for health reasons but this would not impose serious restrictions on food production in Europe. On the contrary, it is an incentive for the development of new safer products.

The cut-off criteria will not significantly affect the market as it will stand at the time of entry into force of the new Regulation, because most of the concerned substances will already have been removed from the market by the review of existing active substances. Therefore, any impact should be considered in the light of the situation as it will be when the new Regulation enters into force. At that moment, all existing active substances will have been evaluated under the current review programme and several substances might no longer be on the market due to other concerns than the cut-off criteria outlined in the new Regulation.

In addition, the new Regulation contains measures, such as the zonal system and obligatory mutual recognition, simplified rules on data protection, clear deadlines for the approval and authorisation procedure and facilitated authorisation for minor uses, which are in favour of agriculture and will increase availability to farmers of plant protection products. Furthermore, the text agreed by the European Parliament and the Council introduces the possibility to approve certain active substances under restrictive conditions for a limited time in order to control a serious danger for plant health.

*April 2009*

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**Thursday 7 May 2009**

Members present

Mr Michael Jack, in the Chair

Mr David Drew  
Mr James Gray  
Miss Anne McIntosh

Dr Gavin Strang  
David Taylor  
Mr Roger Williams

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**Memorandum submitted by the Department for Environment, Food and Rural Affairs (SFS 57)**

1. Following the invitation of 11 December 2008 from the House of Commons' Environment, Food and Rural Affairs Select Committee to submit written evidence for its inquiry entitled *Securing food supplies up to 2050: the challenges for the UK*, this memorandum focuses on the steps Defra is taking to ensure we remain food secure in the UK now and in the future, and in light of the challenge to feed the globe's rapidly growing population sustainably.

INTRODUCTION

2. Defra's response to the Committee's terms of reference attempts to provide an overview of the department's, and Government's work to ensure a sustainable and secure food supply.

3. The Government's definition of UK food security is: "*for people to have access at all times to sufficient, safe, sustainable and nutritious food, at affordable prices, so as to help ensure an active and healthy life.*" Our work on food security is built on analysis carried out over some years, most recently in Defra's analytical study *Food Security and the UK* (December 2006),<sup>1</sup> and followed by our discussion paper *Ensuring the UK's Food Security in a Changing World*, issued last July.

4. The Cabinet Office/Prime Minister's Strategy Unit report *Food Matters* set out four strategic policy objectives, which the Government has endorsed.<sup>2</sup> Our approach to food policy is to join up the health, social, environmental and economic aspects. This will be driven forward by a new Cabinet sub-committee and co-ordinated by a Food Strategy Task Force. It will include work that Defra, the Department of Health, the Food Standards Agency, and a number of other departments are taking forward in partnership. Defra's new co-ordinating role on food policy means working with other departments on wider issues than before such as the social impacts of food policy. The newly created Council of Food Policy Advisers will assist with this.

*How robust is the current UK food system? What are its main strengths and weaknesses?*

*The UK food system*

5. The UK food system is a significant part of the UK economy. Consumer expenditure on food totalled £172 billion in 2007—split between expenditure on catering services (£82 billion) and food and drink for the home (£90 billion). The UK exported £11.4 billion worth of food and drink, the majority of which was highly processed (58% highly processed; 35% lightly processed; 7% unprocessed). The agri-food sector as a whole contributed £79.4 billion (8.6%) to national market sector GVA in 2006, and employed 3.2 million people. In 2007 the UK imported £26.6 billion worth of food and drink imports, of which £5.4 billion consisted of unprocessed agricultural products.

6. The diversity of the supply of our food products in the UK, including domestically, helps to spread risks from potential disruptions such as terrorism or floods. It also enables us to choose from a rich selection of nutritious foods. In 2006, 26 countries, including the UK, accounted for 90% of our food supply, up from 22 countries in 1996. Currently, 34 countries supply the UK with at least 0.5% of our food imports, with no single country accounting for more than 13% (Netherlands having this share), and the vast majority of our food (69% in value) coming from our stable trading partners in the European Union.<sup>3</sup>

7. The food sector has demonstrated its ability and flexibility in dealing effectively with emergencies, for example, the flooding in Gloucester and the southwest in 2007. During the floods the supermarkets remained open and able to provide food to the affected populations and, with the dairy and alcoholic drinks industry, supported the provision and distribution of water.

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<sup>1</sup> *Food Security and the UK—an evidence and analysis paper* (December 2006) at <http://statistics.defra.gov.uk/esg/reports/foodsecurity/foodsecurity.pdf>

<sup>2</sup> These are: fair prices, choice, access to food and food security through open and competitive markets; continuous improvement in the safety of food; the changes needed to deliver a further transition to healthier diets; and, a more environmentally sustainable food chain.

<sup>3</sup> <https://statistics.defra.gov.uk/esg/publications/pocketstats/foodpocketstats/default.asp>, p. 38, 39.

*Strengths and weaknesses*

8. UK farming continues to show its strength and resilience in the face of challenges. The biggest wheat harvest in UK history in the last year is testimony to this, as is the 9% increase in real terms in total farming income. As stewards of the land, our farmers know that UK food production has both positive and negative impacts on the environment. There are examples of good environmental practice, but also challenges for us in meeting our objective of a more environmentally sustainable food chain. Positively, agriculture has shaped the landscape that we know and value and, through appropriate management, can bring significant benefits to the UK's environment. However, the sector is also heavily dependent on oil, energy and water, all of which are increasingly scarce. Agriculture also contributes to climate change: direct emissions from animals accounted for 3% of UK greenhouse gas emissions in 2005. Globally, livestock farming accounts for an estimated 18% of greenhouse gas emissions if associated land-use changes are taken into account. Waste is an issue across the food chain—the main sources of waste being food and packaging. 10% of all UK industrial and commercial waste comes from the food industry and consumers throw away an estimated 30% of the food they buy, half of which is edible.

9. The effects on health of what we eat in the UK are also significant. While consumers are increasingly interested in healthy eating, at current levels 40% of us will be obese by 2025, and 60% by 2050. Current dietary habits also increase the risk of developing cardiovascular disease, diabetes, and cancer. 70,000 premature deaths a year could be avoided if, nationally, our diets matched nutritional guidelines. We also need to consider the accessibility and affordability of healthy food to those on the lowest incomes, particularly at a time of rising food prices.

10. As well as its dependency on energy, oil and water, our food system also depends on telecommunications and transport. Reliability and diversity of supply in these areas remains essential.

11. Our food system benefits from the number and diversity of its supply chains, manufacturing and retailers, and the variety of foods that can be used and substituted. By any objective measure and despite recent price increases, the UK currently enjoys a high level of food security. An initial assessment of the five main elements of food security set out in July's Defra discussion paper<sup>4</sup> indicates that food safety, access to and availability of safe and nutritious food, and the resilience of the food chain are the strong points of the UK food system. Making our food system more sustainable, more secure, and delivering the objectives set out in *Food Matters* remains central to our work.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

12. As last July's Defra discussion paper on food security made clear, UK food security needs to be put in a global context. The Government is committed to ensuring that the UK is a leader internationally in helping to increase global food production in a sustainable way. Agricultural research and development has been shown to deliver a relatively high rate of return, and will help to deliver sustainable increases in production. The UK has announced its intention to invest £400 million in international agricultural research over the next five years.

13. Domestically, the Government wants to see UK producers competing for and winning markets at home and abroad, now and in the future. Our agriculture is strong and resilient with total farming income rising. As well as producing record amounts of wheat in 2008, levels of beef and veal exports nearly trebled. UK agriculture makes a significant contribution to our food security as part of a network of global partners able to trade freely with ourselves and other nations. British agriculture should produce as much food as possible. The only requirements should be that consumers want what is produced and that the way our food is grown sustains our environment and safeguards our landscape.

14. The UK is at the forefront of proposals for a Global Partnership on Agriculture and Food Security (GPAFS)—an idea first launched at the FAO's High Level Conference in June of last year. GPAFS aims to complement the UN's Comprehensive Framework for Action (CFA), and act as a mechanism for the mobilisation of resources for agriculture and food for both the short and longer-term. Central to our efforts is the need to ensure that the global production increases required in future are sustainably achieved and take account of climate impacts.

15. Jane Kennedy, Minister for Farming and the Environment, is co-sponsoring (with Mike Foster at DfID) Professor John Beddington's Foresight study on the future of food and farming. The Chief Scientist's study will examine the global food system, and its implications for developments both here and abroad, asking how we can meet the challenge of feeding nine billion people by 2050.

<sup>4</sup> The five main elements are global availability and resource stability; UK availability and access; food chain resilience; household access to sufficient, safe and nutritious food; and, food safety and confidence in our food.



*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system*

#### *Soil quality*

16. In some parts of the UK we already have low levels of soil cover. However, there is little evidence to suggest that production will be affected significantly by soil degradation such as erosion, compaction and organic matter decline in the near future. These remain on-going issues though, and recent studies suggest organic matter levels are declining in some areas.

17. Precautionary measures aiming to address soil degradation are already in place under CAP cross-compliance and agri-environment measures. The Government plans to improve soil monitoring to ensure it has a good understanding of trends and risks. CAP cross-compliance and agri-environment measures are also being kept under review.

18. There is a danger that the impacts of climate change may add to rates of erosion, increase the amount of waterlogged soil, and increase levels of compacted soils. In addition, temperature rises, and changes in rainfall patterns are likely to affect soil moisture levels which will affect productivity and require increased irrigation. There will also be risks of salinisation from irrigation. Soils act as important carbon stores and research has been commissioned to understand the likely impacts of climate change on key soil threats, and the actions that will be needed once these likely impacts are understood.

#### *Water availability*

19. Abstracting water unsustainably can have serious environmental impacts, negatively affecting habitats and biodiversity and any flood protection they provide. It can also have a negative effect on water quality, reducing the ability of rivers to dilute pollutants.

20. By importing food and other products, the UK is also importing “virtual” or “embedded” water—the water used to produce a product in another country. As a heavy importer of virtual water, the UK has a substantial “external water footprint” (recent estimates by the WWF suggest this to be 62%), and hence the potential to be putting pressure on water resources outside of the UK. The impact of the UK’s external water footprint can be positive or negative—and will depend on conditions in the country of origin. Defra is currently discussing potential further work on embedded water, including future policy and research requirements with stakeholders.

#### *The marine environment*

21. Defra published *Fisheries 2007*, its long-term vision for sustainable fisheries in October of that year to guide future fisheries policy. Focussed on activities in England and within British limits adjacent to England, it strives for a balance between the Government’s economic, social and environmental priorities for sustainable marine fisheries.

22. The Common Fisheries Policy (CFP) provides the policy framework governing the exploitation of marine fish resources in EU waters. In its negotiations on fishing opportunities in EU and other international waters, the UK’s aim is to achieve a balanced and fair settlement which promotes the long-term sustainability of fish stocks, the economic sustainability of the UK fishing industry, and the protection of vulnerable species.

23. Sustainable fisheries must also be a global priority. Fish make up half the dietary protein for 400 million people in the world’s poorest countries, and a fifth of protein nutrition in developing countries as a whole. Additionally, fish exports from developing countries are a significant element of national income.

24. Illegal, unreported and unregulated (IUU) fishing remains a major threat not just to the world’s fish stocks, but to its marine biodiversity, and the livelihoods and security of coastal communities. This problem is particularly critical for developing countries, now that many western fisheries are already heavily fished and well controlled. With strong UK support, the EU has introduced a new Regulation to prevent, deter and eliminate the import of IUU fishery products into the Community.

#### *The science base*

25. Support to encourage thriving and sustainable farming and food industries in the UK, and in reducing the negative impacts of farming on the environment, must be supported by research and development programmes. These include sustainable farming systems and biodiversity, agriculture and climate change, agriculture and sustainable water management, resource efficient and resilient food chains, and plant health. Underpinning many of the research capability needs are expertise and facilities in plant, animal and soil science, a significant proportion of which are provided by research institutes and organisations. There are also several UK university departments with specific expertise. Collectively, these research providers constitute a fairly comprehensive research base for agricultural science and associated environmental considerations.

26. Defra provides £68 million a year in research funding for farming and food including £39 million on animal health and welfare. The BBSRC invests £185 million a year, the Agriculture and Horticulture Development Board £20 million, and industry and NGO contributions to LINK research are about £6 million. Defra has also announced a new national research centre for food and the environment which will strengthen Defra's research capability. The Food and Environment Research Agency will bring together a wide-range of expertise. It will strengthen our work in plant and crop protection and in environmental risk assessment, help us respond to crises speedily, and assist in cutting delays for businesses trading in the UK or overseas. Research also needs to respond to new problems as they arise; Defra's recent announcement of additional funding for bee health and research is an example of this.

27. We have some concerns that expertise in agricultural sciences, and in specific technical areas (for example, soil science, weed science, "whole organism" biology, agricultural engineering), are not being replaced; universities are no longer teaching relevant courses, and long-term career prospects are limited. Additionally, future requirements are likely to be for interdisciplinary, socio-economic science, modelling and systems-based approaches alongside these more traditional disciplines. An example might be integrating expertise in effects of climate change and other pressures on farming systems with socio-economics, to feed into overall policy development.

#### *The provision of training*

28. As well as good farming skills, farmers need business and environmental skills in order to succeed. The Government is working with the industry to help it meet its challenges and ensure the right skills are developed.

29. Defra is supporting Fresh Start, an industry-led initiative which provides training and mentoring for new or recent recruits to the industry, and also a matchmaking service identifying potential opportunities for participants.

30. In addition, the Agri-skills Forum has been formed to help establish a Skills Agenda, owned by the industry, to re-skill and raise professional standards. A skills group has been established, consisting of Lantra, the National Farmers' Union, Landex (an association of further and higher education colleges), and the Agricultural and Horticultural Development Board. Its role is to encourage farmers and growers to value and participate in skills and knowledge development, and to influence educators and the Government to meet industry needs.

#### *Trade barriers*

31. As July's Defra discussion paper on food security made clear, we believe that the global marketplace for food needs to be freed from the distorting effects that subsidies and import tariffs have on producers worldwide. The World Bank has shown that greater liberalisation of trade would result in increased farm output in most of the world, including 5–6% a year in Africa. The tariff and subsidy regime under the EU's CAP keeps prices for consumers artificially high in the EU and in 2007 the cost of EU agricultural policy to EU consumers was €34 billion.

32. The UK still considers that agreeing a balanced Doha deal via the WTO offers us the best opportunity to make the global trading system fairer, and we will continue to work within the EU for reform of the CAP to make it less trade distorting and more sustainable.

#### *The way in which land is farmed and managed*

33. Farmers have an important role not only in food production but as custodians and guardians of the countryside and the environment. UK agricultural holdings represent 77% of our total land area, and the challenges presented by climate change to the industry are large.

34. Since the CAP reform of 2003, farmers are required to comply with a set of Statutory Management Requirements (SMRs) and keep their land in Good Agricultural and Environmental Condition (GAEC) in order to qualify for the full single payment and other direct payments. The SMRs relate to the areas of public, animal and plant health, environment and animal welfare. The standards of GAEC relate to the issues of soil erosion, soil organic matter, soil structure and ensuring a minimum level of maintenance, and avoiding the deterioration of habitats. Maintaining the quality of the soil means that the soil will continue to sustain production.

35. Farmers can also voluntarily opt to join Environmental Stewardship (ES) schemes. ES provides funding to farmers and land managers in England who deliver effective environmental management on their land, and has the following primary objectives: wildlife conservation, maintaining and enhancing landscapes, protecting the historic environment and natural resources, and promoting public access and understanding of the countryside.

36. Climate change is having an increasing impact on farming and land management, but options exist for farmers to help them cope with, and take advantage of, the changes. However, more work remains to be done to meet these challenges. Farmers and land managers need to be aware of and manage risks climate

change presents to their businesses. Farmers have a responsibility to reduce their greenhouse gas emissions by, for example, providing animals with diets that specifically match their nutritional requirements, and by being as energy efficient as possible. There is a need for further research and policy analysis, and Defra is undertaking a specific programme of research on agriculture and climate change (around £5 million in 2007–8), comprising projects in the following areas: measuring emissions from agriculture; mitigating agricultural nitrous oxide and methane emissions; climate change impacts and adaptation; energy in agriculture and food; bio-energy; and renewable materials.

37. Globally, the UK has been leading the call to reaffirm the Millennium Development Goal commitments, including MDG 7 on ensuring environmental sustainability. This covers a range of subjects—CO<sub>2</sub> emissions, water, biodiversity, sanitation, forests and fisheries among them. It is crucial, therefore, in protecting the natural resources on which the poor depend most, and to achieving the other MDGs including that on hunger.

*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

38. Evidence even up to last year indicated that UK consumers are retaining their growing interest in food, in particular the health, quality, origins and ethical aspects.<sup>5</sup> Defra's latest expenditure and food survey<sup>6</sup> indicates:

- A continuation in the downward trend of purchases of less healthy foods; purchases of whole milk, white bread, some meat products<sup>7</sup> and soft drinks have dropped.
- Average energy intake per person has dropped, along with intake of saturated fatty acids, sodium, and a big drop in the intake of added sugars (i.e., sugars not found naturally in, for example, fruit).
- Fruit and vegetable purchases are rising slowly.

39. A report from market analyst Mintel in September 2008 suggests that locally sourced food is among the most buoyant food categories in terms of growth, following a steady upward trajectory from 2003 to 2008. In October Mintel said that manufacturers offering quality premium goods are likely to be resilient in any market turbulence. The success of direct selling by farmers, suggests that the interest in local food networks will continue and grow for the foreseeable future.

40. We also expect to see the following consumer trends emerge in 2009:

- Less food waste through greater awareness of the amount of food we waste in the UK and its cost in both personal financial and environmental terms.
- A move away from premium to standard and basic supermarket product lines.
- More flexibility and willingness to compare products, brands and retailers on price—there is evidence this is already happening with the rise in purchases of own-brand products.
- A preference when dining out for consumers to choose less expensive places.

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

41. Defra is focused on working with the sector to achieve a sustainable, secure and healthy food supply, and a thriving food and farming sector. The Food Industry Sustainability Strategy (FISS), published in 2006, highlighted the way in which Government and the food industry must work together to improve sustainability. Building on earlier industry input, the Food and Drink Federation launched its successful and ongoing Five-Fold Environmental Ambition in October 2007 with commitments on CO<sub>2</sub>, waste, water, and transport. Defra has also established a Food Industry Better Regulation group—a forum for discussing regulatory issues affecting the food and drink supply chain.

42. Defra's role in an emergency, having collected and disseminated information, is to enable Ministers to take policy decisions to support industry's response; to relax drivers' hours, for example. In the case of a very severe emergency, the Secretary of State could use Section 2 of the Civil Contingencies Act to direct the actions of the food industry as required.

43. The Government also works with industry and the public sector to promote business continuity planning so as to improve resilience. Defra leads the relationship with the food sector, although the Food Standards Agency leads on food safety. Defra has set up and chairs the Food Chain Emergency Liaison Group, a forum at which other Government departments, industry, and the relevant trade associations can share information and jointly consider developing policy.

<sup>5</sup> Full details in Chapter 2 of *Food: an analysis of the issues*, Cabinet Office, January 2007, revision D, August 2008.

<sup>6</sup> Defra/ONS (December 2008) *Family Food: A report on the 2007 Expenditure and Food Survey*.

<sup>7</sup> Including offal, bacon, ham, chicken, turkey, canned meat, pies, burgers, and sausages.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

44. The Prime Minister's Strategy Unit report, *Food Matters*, published in July 2008, signalled a fresh approach to food policy across Government. The report highlighted the need to join up food policy to address the health, environmental and economic challenges in the food system in an integrated way. It set out four strategic policy objectives:

- Fair prices, choice, access to food and food security through open and competitive markets.
- Continuous improvement in the safety of food.
- The changes needed to deliver a further transition to healthier diets.
- A more environmentally sustainable food chain.

45. Along with specific policy recommendations, the report also established a Food Strategy Task Force, to bring together departments with a stake in food policy, in order to better coordinate work on food across Government. Subsequently, the Machinery of Government changes on 3 October 2008 gave Defra an enhanced role on food. Now, with the lead for co-ordinating efforts on food across Government, Defra is working with other Departments on wider issues, such as the social impact of food policy. This is in addition to its lead responsibilities on farming, the food industry and their environmental impacts. To support this new role, a new Ministerial Sub-committee has been established (Domestic Affairs—Food), and the Food Strategy Task Force (which was already in place) convenes senior officials from the relevant departments to support the Sub-Committee.

46. Defra has already forged good working relationships with departments and others in taking forward its work on food:

- With the Food Standards Agency and the Department of Health in delivering actions set out in the PMSU *Food Matters* report and in joining up the health and environmental impacts of food.
- With DfID on food security, sustainable agriculture, and environmental sustainability. Defra is a delivery partner for the DfID-led PSA 29 Reduce poverty in poorer countries through quicker progress towards the Millennium Development Goals.
- With BERR and the OFT on competition issues.
- With the Cabinet Office Civil Contingencies Secretariat, the Centre for Protection of National Infrastructure and a range of Government departments (in particular the FSA, BERR (now DECC), Transport and Health) on resilience.
- With Foresight on its Global Food and Farming Futures project.
- With DECC on climate change deliverables.
- With international partners on CFA and GPAFS, through multilateral and bilateral commitments such as those developed with China and India through the sustainable development dialogues (SDDs) which involve sharing expertise, skills and knowledge with the places that need it most.
- With our European partners including FAO on the range of issues affecting food and agriculture.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

47. As *Food Matters* said last July, the “UK makes a small but meaningful contribution to overall global food supply...but the UK seems likely to have a greater impact via its influence on international policy, diplomatic initiatives, development programmes and research efforts”. The Government believes we should maximise our UK productive capacity where this can be done sustainably and is driven by consumer demand. We have also set out above how the Government is contributing to initiatives internationally and in terms of research.

48. Defra is working increasingly closely with DfID on global food security. One measure of UK success in responding to the global production challenge is the delivery of the DfID-led PSA 29, *Reduce poverty in poorer countries through quicker progress towards the Millennium Development Goals*. Defra's contribution towards PSA 29 centres on the seventh of these goals (MDG7), which aims to “ensure environmental sustainability” and underpins achieving the other MDGs including MDG1, on eradicating extreme poverty and hunger. DfID and Defra's co-operative effort is essential for helping deliver increased global food production in a way that is environmentally, as well as economically and socially, sustainable.

49. Professor Beddington's Foresight study referred to above, and co-sponsored by Defra and DfID Ministers, also aims to produce practical, action-oriented recommendations to achieve just this objective.

*Witnesses:* **Hilary Benn MP**, Secretary of State for Environment, Food and Rural Affairs, **Professor Robert Watson**, Chief Scientific Officer, and **Ms Susanna May**, Deputy Director, Food Security and Prices Project, Department for Environment, Food and Rural Affairs, gave evidence.

**Q523 Chairman:** Good afternoon, ladies and gentlemen, to what, I think, will be the concluding public evidence session in the Committee's inquiry into food security. May we welcome the Secretary of State, Hilary Benn, Susanna May, who is the Deputy Director, Food Security and Prices Project, and Professor Robert Watson, who is the department's Chief Scientist. You are very welcome indeed. Secretary of State, I know you know everything there is to know about this subject, because you have been on many public platforms, but the Committee would certainly welcome the opportunity of hearing from your two colleagues at moments you consider to be appropriate to perhaps bring their own dimension to bear on the subjects that we are going to discuss. Food security came to the fore in 2008 with the rapid rise of certain commodity prices and the reaction in certain countries, for example Argentina, who imposed export restrictions on grain crops, and suddenly the world woke from a long period of slumber on the subject of food and started to worry about food security, and that has triggered, certainly on both a global, European and national level, a great deal of activity and we certainly welcome that. Could I start, Secretary of State, by asking you one question? Keeping the nation fed is one of the most important things that Defra has responsibility for, and so, when you are thinking in those private moments about food security, what keeps you awake at night?

**Hilary Benn:** Heavens. First of all, can I say, Chairman, that I very much welcome this inquiry, because I agree entirely with what you said in your opening remarks about the events of last year having caused a lot of people to say, "Hang on a minute: if this is what can happen when these events come to pass, what is it, indeed, that we should be worried about as we think about the future?", and I think it really was a wake up call, and that is a phrase that I have used. What worries me is how we are going to feed the growing population of the world—another two and a half to three billion people in the next 40 to 50 years—and how we are going to do that in a sustainable way, given that we know that the climate is changing and water will be in scarce supply in some parts of the world. We know that natural resources, particularly oil, will eventually diminish, and given that, I think, Mark Twain said, "Buy land because they've stopped making it", we have got a finite quantity of land with which to do that. We have to make sure that the system is resilient to the shocks and crises that may come our way, and we saw some examples of that with the rise in prices, the food riots and the export bans last year. Is food available? It is one thing to have enough food. We do wrestle in the world with the fact that we have got about a billion human beings who are overweight in some respect and a billion people who go to bed hungry every night, so we have got an inequitable distribution of the food that we have got, and from my days as the International Development Secretary, in countries where people were going really short of food, there was enough in the country,

but it was not available either because it physically was not where they could get to it or they did not have the money, the means, to buy it, and so affordability is, I think, a really important part of it. In the UK at the moment we are food secure, but I think there are some big challenges as we look towards the future. Fundamentally it is about making sure that people have enough to eat.

**Q524 Chairman:** I was intrigued. On your department's website, from my looking, there is not a page that says, "Food security". To find your comments on food security you have to go to the page that is headed, "Food and drink", and it does worry me a little bit that you have attached a lot of priority in what you have said to the importance of the subject but there is not actually a specific bit on the very comprehensive Defra website that actually deals with what you are doing on food security. The boundaries of this inquiry to a degree were established by the FAO<sup>8</sup> at their Rome Food Summit last year. Gladly, I attended, but I could not find anybody from Defra. There may have been somebody there under cover, but I could not find any representative there, which concerned me a little bit, because there were two targets that emerged: an increase of food production by 50% by 2030 and the doubling of the world food supply by 2050. Nobody at the time demurred that those were not sensible projections. How does Defra see those targets? Does it recognise them, does it think they are valid and are they guiding the work that you have now initiated?

**Hilary Benn:** On the website, I am pretty sure the next time you look, and I do not know how long it will take us to do it, but if you do not mind me not waiting for recommendations to come out from the Committee in its report, we will get on and do something about this, because there is quite a lot of stuff that we have produced already that we can, I am sure, usefully put together in that place. Secondly, as you know, Douglas Alexander represented the UK Government at that particular conference. On the targets, they have, indeed, become the accepted figures that everybody repeats, although since we are talking about a population increase of potentially 50% and talking about a doubling of the food production, the aim of the target is to ensure that those who do not have so much to eat at the moment have more food to eat; so it is more than just keeping pace with the current distribution of food and who has access to it. I think it is also worth observing that the United Nations Environment Programme has produced some estimates that say, if you could halve the losses post harvest in distribution, because we know in parts of the world a lot of food rots before it gets anywhere near anybody, either because it cannot be stored properly or there are difficulties in transport, you could feed maybe another two billion people at current levels of nutrition. I suppose the Foresight Study which John Beddington is leading, which is

<sup>8</sup> Food and Agricultural Organization at the United Nations

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7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

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one of the steps that we have taken in the light of what happened last year, and the really big focus there is on this work, which will help to answer that question. In the end a target is something that you aim for, and I think it acts as encouragement and an incentive. What is not in doubt is that the world is going to have to produce quite a lot more food.

**Q525 Chairman:** To be specific, the question that I asked was: does Defra recognise those two targets, if you like, as valid benchmarks against which to judge what the United Kingdom, the European Union and others do as they set out on the road to deal with the agricultural challenge that is implicit in those targets?

**Hilary Benn:** The international community, through those bodies, has set those targets. I answered the question by saying that they make certain assumptions, and also pointing out that there are other things that you could do to help to deal with the problem that would not on its own result in those kind of increases in production, and it is that target we are working for. I do not think anyone is going to mathematically sit down and say we did not get to 50%; we only ended up at 48%. The fact is we need to get our skates on, we need to make progress, and they are a guide to what it is we are seeking to do, but I do not think we should get hung up on the precise figures.

**Q526 Chairman:** Given the implications of those targets, and your department takes the lead in the UK on food, would you describe to the Committee what Defra's role is in actually responding to the challenge of global food security as implied by those targets?

**Hilary Benn:** First of all, it is not just a job for Defra.

**Q527 Chairman:** But you hold the ring within government on food.

**Hilary Benn:** That is correct, but when it comes to the contribution that we make to help other countries to grow more food, obviously the lead responsibility rests with Douglas Alexander and the Department for International Development. You will have seen last year, Chairman, the increased funding that we put in, as the UK, to deal with the immediate crisis, which is more money for the World Food Programme to ensure that people have enough to eat. There is a considerable investment we are making in international agricultural research, including through the CGIAR Programme (Consultative Group on International Agricultural Research). It is really a network of research centres. I do not know whether it began when I was at International Development, but, anyway, we are putting in a considerable amount of money. We are supporting the Global Partnership, the UK, which aims to match plans within country for improving agriculture and production with sources of funding. It is not a new funding stream, but it is trying to tap into bilateral funding from individual donors, money that is coming from the World Bank. I think the truth is that the world took its eye off agriculture, including development. I think there is no doubt

about that. Some developing country governments took their eye off it, some of the international institutions took their eye off it, but that has begun to change, and, of course, there is the Framework for Action that was agreed jointly by the UN and the World Bank which is looking both at how you feed people who are short of food now and how you can grow more in the future. So that is, if you like, on the international side. It is pretty clear to me that within individual countries there is a range of things that need to happen. Farmers, first of all, need to feel secure on the land, because if you do not feel secure on the land do you have the incentive to invest in improving it? Secondly, you need better seeds; you need fertiliser you can afford. I remember visiting a group of farmers in northern Ethiopia some years back who told me, and it stuck in my mind, that a 100 kilogramme bag of fertiliser would cost the average family in that village half their annual income, and part of the reason was the huge expense of getting it there. Hence my point about transport, better storage, access to credit: because if you are going to buy fertiliser, or improve irrigation or better means of tilling the soil, you need money, you need a market, because in the end, as last year's record wheat harvest in the UK showed, if there is a price incentive, then you bring forth a lot of extra production. Part of the problem that some developing countries face is the lack of markets, and we make it difficult by dumping surplus produce, which is why progress on Doha is so important, and the agricultural revolution we saw particularly in parts of south-east Asia has not really got to Africa. As I think Douglas Alexander has talked about, 25 years ago the world came together and said we need to help to feed Africa. Africa is going to play a really important part in the next 25 years in feeding itself and actually helping to feed some other countries as well. That is on the international side; I could move to the UK if you would like me to do so.

**Chairman:** I think we are going to explore that in more detail. I am going to pass the questioning to Anne McIntosh.

**Q528 Miss McIntosh:** Does it worry you that your definition of food security, Secretary of State, is different to the World Trade Organisation's definition of food security?

**Hilary Benn:** It does not cause me to lie awake at night, no.

**Q529 Miss McIntosh:** Is it the case that we have gone from a position of being a net exporter of food to, now, a net importer of food? When you say that we are food secure, is that not a fact?

**Hilary Benn:** In terms of self-sufficiency, as you will know, we are more self-sufficient now in the UK at about 60% overall, 73% of the food that can actually be grown in the UK, than we were in the 1930s and the 1950s, and it is quite interesting, if you do go back, to look at the degree of self-sufficiency. Clearly, during the Second World War the position was rather different, because our food supplies from other countries were greatly threatened by the U-boats. So we are in a better position than we were in

7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

the past and, of course, we export food as well, and that is very important to the farming and the food production industry.

**Q530 Miss McIntosh:** What is the status of your *Food Matters* report? The vision and strategy for food, which we were tasked with delivering in the *Food Matters* report, is it a plan for agriculture and the food industry in the UK up to 2050? Is that still the case?

**Hilary Benn:** We are making a lot of progress on implementing the recommendations that are in the *Food Matters* report. Just to give some very practical examples, the voluntary scheme on calorie labelling in restaurants and cafes will start in June. The pilot of the healthier food mark, which is in the public sector, particularly central government, the NHS and the Prison Service, will begin in July. We will talk about this, I am sure, more later, but we have pulled together all of the funders who are interested in agricultural research in the UK to ask the question: what are we all doing? Are there gaps? How do we fill them? The Foresight Study I have mentioned. The first meeting of the High Level Group we are hosting at Defra, we are co-chairing this with DFID, later on this month and, of course, we will be publishing both our vision and our plan on what are we trying to do and how are we going to get there in the autumn. Around the same time, we have not quite decided yet, we will be publishing the results of the assessment of food security that we have done because, having highlighted the issues in the consultation paper we published initially, I reflected on what was happening in 2008 and said we need to really start to think about this. We are doing a very detailed piece of work looking at all of the potential threats to food security here in the UK, understanding their nature and what we can do about them. It is work in progress and I think it is going to be a very comprehensive piece of work. I am not aware of any other country that is doing something on the same scale, and we probably have not done it in the UK in the same way since, no doubt, we had to do so in the Second World War.

**Q531 Chairman:** Does that cover all aspects of the food supply chain?

**Hilary Benn:** Yes, it does, from what might happen in terms of climate, of shocks that might occur, if you have trouble with fuel supply, what happens if ports cannot operate for some reason, because some ports have specialist facilities for inputting certain types of product. A lot of the soya bean comes into Liverpool, as I recollect, and a lot of bananas come into a port on the south coast. I cannot remember if it is Southampton or Portsmouth. So it is trying to look at all of the different risk factors which might impinge upon our food security.

**Q532 Miss McIntosh:** The Government has a glittering array of chief scientific advisers. We had one scientific adviser that said climate change was the biggest challenge that the country faces; another scientific adviser has told us that food security is the greatest challenge. There is one area that is affected

by both food security and climate change, and that is where we do have inundations. We saw the scale of the summer floods 2007, where farmers lost huge tracts of land and their produce, which of course was not insured for the most part, and, obviously, we lost our potential food supplies: peas, cabbage, grain and potatoes, in particular. How do you reconcile these different challenges? Is the department minded to look at the outcome measures, particularly to make sure that farmers will be compensated for this in the future?

**Hilary Benn:** I would say in answer to your first question, Miss McIntosh, the truth is they are both big challenges, because climate change impacts upon our ability, potentially, to grow enough food for the world. So it is not a competition between the two; they both matter hugely. On agricultural land, as a society we have a choice to make about how much money we invest in flood defence and, as you know, because you follow these matters very closely, the investment is going up. How do we prioritise where the schemes are going to be put in, where we can protect property? How do you value residential homes, how do you value businesses, commercial as against agricultural businesses? And there are cost-benefit analyses that have to be done. In the end you can change the formula for distributing the money if you want to, you can come up with any formula that you like to do that, it is the amount of money that we are putting in, but also recognising that, in some cases, in some places, while our policy is to do our darndest to defend as much as possible, depending on what happens to sea level rise (and that depends on what happens to the climate) we may find it difficult to protect everywhere, and that is a serious issue for food: because if (and it is not unique to Britain) agricultural land started to disappear under the waves around the world, by definition we have got less land on which to grow a greater amount of food, which will put an even greater onus on trying to get productivity on the land up, which is going to be a very big task both for research and for farming practice.

**Professor Watson:** Just to show how we are connected, as you know, as you have just said, there are several CSAs, and under John Beddington's leadership we actually started off saying there were three main issues that we needed to work across government as CSAs, one was climate change, one was counter-terrorism and one was pandemic flu. We then added a fourth, which was food security, and we embedded it in the climate change group. So we actually recognise climate change is a separate issue from food security and vice versa, but they are intimately coupled, and, as John and I would both say, we have to look at the nexus between food, water and energy security and its relationship to climate change and other issues such as ecosystem services. So, absolutely, they are one of the same issue and we recognise that. Climate change is one of the key threats and, as was pointed out right at the beginning by Michael Jack, the challenge is not only doubling the production of food over the next 50 years, it is how do we do it in an environmentally and socially sustainable manner? The International Assessment

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7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

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on Agriculture that I directed recognised that we were increasing our food production and it was coming at the major expense of destroying many other ecological systems, and so we have to look at the question of, not how you double it, but how do you double it and make it socially and environmentally sustainable, and one of the big threats is climate change; not the only one, but one of the big ones.

**Q533 Miss McIntosh:** How do you reconcile the inevitable short-term political cycle with the long-term vision that you would like to set out for delivering a UK food system?

**Hilary Benn:** Heavens. I think by being straightforward and honest about the nature of the challenge that we are faced with, because, frankly, whoever is in government anywhere in the world, this is going to be a really important issue that they are going to have to deal with. To tell the truth about this, it covers a whole host of things, and actually the evidence sessions that you have been undertaking, if I may say so, and the fact that we are genuinely looking forward to what you have to say in your report, is part of the conversation between us about what is the right thing to do: because it is not immediately obvious that you look and say, "Right, if you just press those three buttons, we have got the problem sorted for the next 50 years". It is much more complex than that. The question, I suppose for each of us, because everybody has to play their part, it is not just a job for government, is what is the contribution that we can make? What is the thing that we can influence? How can we get the incentives right? How can we build the understanding? How can we get people to change the way in which they do things? We cannot do this by direction alone, both because we have a much more diversified system now and partly because you do need change from the bottom up. If you take a really practical example of farmers and the way in which they apply fertiliser, we know that you can be more selective if you have information about what is the nitrogen content of the soil already, and having talked to farmers who are using that practise, analysing the soil, using high-tech equipment, GPS, to then go round and put the right amount of fertiliser on the right bit of the field. There is a really practical example of how you can reduce the imports; it has a benefit in terms of climate change; it means it is less costly for the farmer because fertiliser costs a fortune now. So we need a combination of leadership from the top, the right kind of advice, the right science and also the choices that we make as individuals about what it is that we eat, because the demand comes from people.

**Q534 Chairman:** May I pull you back to the question that Anne asked. If we look at the organisational, the institutional framework, politicians come and go on a four to five yearly cycle, but some of the work that is going to have to be done will have to be long-term and continuing. We are going to have a session and some questions on the science base, but what I want to know is, if we are going to put in train (and

that is what the question asking) programmes, policies and approaches which recognise the break-point of 2030 and 2050 and do all we have to do meet those targets, what are you going to put in train that will be of a lasting nature which is almost outwith the cyclical nature of politics but where the work has to carry on?

**Hilary Benn:** All I can do for the period that I have got responsibility for this is to take the right decisions and put in place the work that I think is going to start the process of dealing with this. It is for others who come afterwards to take it forward. The more that we can build a consensus, frankly, about what needs to be done, the better chance the ebb and flow of the political cycle will not get in the way of carrying on with it afterwards, would be my answer.

**Professor Watson:** I think what we have to recognise, and we could ask ourselves the question, is "What was the cause?", and it was implied in your opening remarks about the food price increases. It is really about six factors. It was very poor harvests, especially in the US and in Australia; it was the use of food crops for biofuels, especially maize in the US, where one-third of last year's crop was used for biofuels; it was the energy price which caused the high cost of fertilisers and the costs of mechanisation; it was the increased demand and the type of demand for China for more meat, export bans and speculation. What we have to realise is things go on and off the boil. These are issues that will stay with us for decades, so it is our climate change policies, our energy policies; it is to do with the use of biofuels; it is how do we do trade, as Hilary has already said. What we have got to recognise is that because the food price has come down in many parts of the world, it does not mean to say the problem has gone away. Part of it is energy—oil prices have come down drastically—the economic slow down. So we have got to recognise these are long-term issues. They cut right across sectors—it is not just Defra, it is DECC, it is the international organisations like the World Bank—and, as has been already pointed out, a few years ago the issue that was food prices were so low that farmers were going out of business because they could not make a profit. So we have a twin challenge: how do we make food affordable for the poor and everybody and, at the same time, a profit for the farmer? I think these are the twin challenges we have to keep our eye on.

**Q535 Miss McIntosh:** What working relationship have you established with the devolved administrations to ensure that the Food Strategy is coherent across the whole of the United Kingdom?

**Hilary Benn:** Food policy is, as you know very well, a devolved matter, but we are working with the devolved administrations both on the food security assessment, because that is looking at the UK as a whole; we are also working with them on what will be our shared view of what a sustainable and secure food system is going to look like. That is the first thing. Secondly, the Council of Food Policy Advisers, which you know I have established, is going to be holding a joint session with the devolved administrations in November to take their mind.



7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

Obviously we work closely together on matters European, as they affect what we are discussing here today. There is, in fact, going to be a ministerial meeting in Edinburgh on 11 May, which Jane Kennedy is going to, where the ministers are going to come together to talk about this. So one has to respect the devolution settlement, but in the end, of course, we have a shared interest in doing this.

**Q536 David Taylor:** Secretary of State, you probably recognise this quote. For the avoidance of doubt, “No ifs, no buts, I want British agriculture to produce as much food as possible”, which is what you said at the Oxford Farming Conference. Others have observed that that, in a sense, is a political slogan, a statement of priority, but it is rather incoherent as far as being an actual detailed plan, bearing in mind the problems, as you have referred to them in your earlier remarks, in pulling together the agri-business and the big five supermarkets, including the Co-Op I am now pleased to say, to take the necessary steps to encourage farmers and growers to plan. What do you feel does need to be done to flesh out that particular statement you made back in January?

**Hilary Benn:** I said that, in part, because there was some debate about whether there was a conflict between production and sustainability. People would sometimes say to me, “Why do you keep going on about the environment and sustainability? It is about production, surely.” To which my answer is that it is not a competition; you are going to have to do the two together. That is the first point. Secondly, what is going to determine the level of production? I noted with interest that when Peter Kendall came before you, he did say that it is not about setting targets for production, because I know there has been some debate. Very few people have said, “Let us go for self-sufficiency”, some have said we should have targets. To be honest, I do not know for the life of me how you would set a target for potato production in the UK, and what the policy would be if you did not meet the target I do not quite understand either. Clearly price acts as a very powerful incentive to production, and we saw that with the wheat prices last year. I think, secondly, there is more we could do on productivity. We have not talked a lot about that. By and large British agriculture is pretty productive compared to some other systems in the world, but there are still gaps between the most productive and the less productive and, therefore, what can be done to spread good practice to try and raise the overall standard—

**Q537 David Taylor:** Can I interrupt briefly and return to the core of this. How do you get, in a very competitive market, agri-business and the big farm retailers and others to work together in a way which will provide the necessary price signals and messages so that farmers and growers will adjust accordingly?

**Hilary Benn:** The third point I was going to come on to, which seems to me to be a fundamental part of this, is what we as consumers choose to buy. One signal which the supermarkets and the food companies pay very, very close attention to is what

customers want. If people say, “I would like to buy UK produce. I am interested in where the meat comes from”, or apples, or cheese, that is a powerful way of supporting the industry, and I think there is a growing interest, with farmers markets and lots of other things that are happening, in where food comes from and consumers are in a very powerful position to help answer the question: how can British agriculture produce more? I think we have to think about regulation, because the regulation has got to be smart. If I take two examples of things that I have been fighting in Europe on recently, one was the pesticides regulation where we did the assessment, in the end we thought it was, frankly, over the top and could have a potential impact, depending on what substances are ruled in or out when they finally come to do that: the triazoles in particular which help to deal with septoria in wheat—very important for controlling that particular fungus, I think it is—and the second example would be electronic identification of sheep, where we have been hard at work. There is a slightly greater awareness now in Europe of the practical implications of that, and we have had some success in mitigating the way in which that is going to be implemented. Lastly on my list, I would say skills. Going back to the point I was making earlier, before you rightly called me to order, Chairman, what farmers do on the ground, making sure that we have the skills to grow more food sustainably, is really important, and that is why I recently called together all of those who have an interest in skills for a “round table” at the Royal Agricultural College in Cirencester, and the Agri-Skills Forum, which is the industry lead on this, is going to come back to me and say, “Here is our plan”, because I think the industry has to take a lead, the Government then has to look at what part it plays.

**Q538 David Taylor:** You say the strongest signal for retailers, of course, is consumer preference, and marketing is partly shaping consumer desires and partly responding to them, but should not labelling be in there somewhere, because that is a chronic problem that has been raised with this Committee in the eight or nine years that it has been in existence whenever we have talked to the NFU<sup>9</sup> and others. What more are we doing on that, briefly?

**Hilary Benn:** I agree with you completely. We are pressing in Europe, in the changes that Europe is considering, for better labelling to give that information to consumers. It is very striking, if you take the pig industry, that they have had a difficult time. Their central argument has been not to come to Government to say, “Can you sort things out?” We set up the Pig Taskforce, which was a recommendation from this Committee, and we have got on and done it, and Jane is chairing it. They said to consumers, “Look, if you want to be able to continue to buy pork and bacon from British producers, buy our product”, and I thought that was a very effective way of trying to deal with it, because I think it is right that people should be able to know

<sup>9</sup> National Farmers’ Union

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7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

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where stuff comes from and then they can make a choice as to what they buy. It is a very practical way of supporting production in the UK.

**Q539 David Taylor:** A final question from me. It relates to incentivisation. You quoted Peter Kendall earlier on. At another point he pointed out that farmers will respond quite frequently and effectively to tax incentives when looking at trying to encourage them to expand capacity, but at this very time the agricultural funding allowances have been removed. That seems to be sending a bit of a mixed message, would you not say?

**Hilary Benn:** That is a step which the Government has taken in order to try and simplify the system. We are in the process of talking to HMRC<sup>10</sup> about the definition of plant and machinery, because there is a continuum—I see you smiling, Chairman—between just a physical building and plant and machinery that is part of a building, which is part of an agricultural process, bluntly, to try and get the most flexible and reasonable interpretation of that. Some farmers will be able to take advantage of the further changes relating to investment you can set against tax that were announced in the budget by the Chancellor, but I know it is an issue which the NFU has been vigorously campaigning on.

**Q540 David Taylor:** You have signed up to the target of 50% by 2030 and doubling by 2050, but food is not an homogenous product. Do you have any idea as to the nature of commodities which you might want to encourage greater production of within the United Kingdom and how would you incentivise?

**Hilary Benn:** To be honest—I gave the example of apples earlier—I really do not see why we cannot produce more apples, but in order to push that you have got to have more demand for British apples. Actually, looking at the figures last night, in the last four years the proportion of apples that are home produced has actually managed to rise from a rather small 23% to 33%, so that is a bit of progress, but if you go back over time, of course, a lot of apple orchards were grubbed up. Strawberries we are growing more because of the new production systems. I think vegetables and apples would be a good place, and I think consumers have a very important part to play in saying, “I would like those to be produced.”

**Q541 David Taylor:** Susanna looked as if she may be about to reply.

**Ms May:** No.

**Chairman:** As the recently appointed President of the National Fruit Show, I am delighted to have your support for fruit, but I want to pass the questioning to Gavin Strang.

**Q542 Dr Strang:** Do you expect the valuation of sterling against the euro to result in an increase in production in UK agriculture relative to the rest of Europe?

**Hilary Benn:** Clearly, the movement that there has been in the last year and a half, two years has improved the position, but I am not going to offer any forecast on where the price is going to go, for time-honoured reasons.

**Q543 Dr Strang:** To pick up a point on production, in a sense we are all saying we would like to see more British production in certain varieties. Do you actually look at this? Take milk, for example, which is a hugely important commodity. Does the department constantly look at the milk situation and see how you can help facilitate increased production? Do you look at the situation when it looks as if they are starting to take the farm gate price down again, which obviously is a matter of some concern? Does the department consciously focus on each commodity in that way regularly and seek to help domestic production, or do you simply see it as all part of the CAP<sup>11</sup> and all responding to the single market?

**Hilary Benn:** We obviously keep a close eye on what is happening. I think it is fair to say that it has been left to the market for a very long time, because food production has always been a private sector business, with really the exception of what has happened in war time and the state taking powers to direct and to encourage. Since you have taken milk, Dr Strang, as an example, we are self-sufficient in milk. Although there are fewer producers, if you look at a chart of milk production going back over the last 20 years—it has gone down a bit but it is 13.3 million litres in 2008, it was a bit more 20 years ago—it has become much more productive. That is undoubtedly what has happened in relation to it. There is, of course, a continuing debate about the milk price that is paid to farmers and, more broadly on the question of prices, there have been various inquiries into that. The Competition Commission is having a consultation as we speak on the question of whether there should be an ombudsman, and that may come to Government to form a view on in due course. I think if there are particular difficulties in particular sectors, that is when Defra might become involved, but, generally speaking, the operation of the markets produce the picture that we can see.

**Dr Strang:** There is a decline on the pig side, and there has been concern expressed in the last week or two that the poultry sector may start to go the same way. Does that concern you? Are you concerned about the future of production in the UK?

**Q544 Chairman:** To add to that, the concern is (and this is why we asked about the juxtaposition between the long-term and short-term cycle) that you can start in the short-term to erode, if you like, your agricultural and food infrastructure and it is very difficult to get it back if the future trend says we need more of the things that we are good at producing.

**Hilary Benn:** I agree with that, and I think we absolutely could not be in a position to say, and it is a caricature where some have positioned themselves in the past, “Well, we can always buy the food from

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<sup>10</sup> Her Majesty's Revenue and Customs

<sup>11</sup> Common Agricultural Policy

7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

somewhere”, because I do believe very strongly that it is important that we have a strong, productive agricultural base in this country as a matter of fundamental policy. The Pig Taskforce actually is a really good example of a specific initiative being taken, following the advice that you have given, working with the industry to say, “What can we do to assist”, and it has been very much welcomed by the pig sector. There are things that we can do in government to improve the extent to which we buy UK product, and you can see the numbers are going up that are reported every year, but I know that that taskforce is looking at some particular products to make sure that the industry can produce what those in the public sector are purchasing. Where there is a particular difficulty, I think it is sensible for Defra to get involved to see what we can do to assist, and I made the observation about fruit and veg because actually we need to eat more of it. We are importing a lot more of it because people are eating more, and that is a good thing in terms of our diet, but we do have, as you said, Chairman, a natural advantage in relation to some of these things, and I think if consumers demand, then that is probably the single most powerful lever that can be pulled to encourage more production if they say, “Hey, we want apples from Britain as opposed to apples that are imported from somewhere else.”

**Q545 Mr Williams:** Secretary of State, you rightly talk about the power of the market and the consumer, but the fact is that since we have decoupled support from agriculture the amount of food produced in this country, or temporary food stuffs, has decreased. It seems to me that, if you are in the business of stimulating or encouraging particular forms of production, you have actually thrown away every lever that you ever had in terms of being able to incentivise beef production, or wheat production, or whatever. If people are really serious that there is a problem in food security, then we directly have got to encourage farmers to produce, and the levers are not there at the moment. You have talked about the wheat production high yields last year reflecting higher prices. As I understand it, our plantings are down by 15% this year. What is your view to coupling and decoupling?

**Hilary Benn:** It is down because the price has gone down. At its peak it was £180 and it is now 90-ish, something like that. So fundamentally, if we were not as a world to make progress in producing more food for a growing population, one would expect that to be reflected in the price, and that would then have a consequence of bringing forward more production. We did have a system that produced a lot, and more than we could use and more than we could eat, and it was stuck in intervention—it was called the Common Agricultural Policy—and one of the consequences of that policy was that we undermined agricultural production in other parts of the world. We made it very hard for farmers in Africa and elsewhere to have a market because we were selling the stuff that we produced and did not want at a subsidised price and ruining the chances of them having a successful business, and we have still some

way to go there, although intervention stocks are very, very different now compared to when we had big lakes and mountains and so on, and although there are some in Europe who say, “Told you the CAP was a good idea. Let us go back to where we were”, I am not persuaded that that is the right approach, because there is also (and this is the other reason I give) an environmental consequence to that, as we know only too well. You just say: “Right, produce, produce”, never mind what it does to the raw material on which production depends—the quality of the soil, the water, the biodiversity—and we have got to think, it seems to me, smartly about this. Bob you were nodding.

**Professor Watson:** Yes, that was the main conclusion for the international assessment that I directed. Yes, we have increased food production across the world. It is not socially equitable; there are still a billion people who are going to bed hungry every day. There are significant adverse effects—contributions to climate change, loss of biodiversity, soil and water degradation—and one of the biggest problems was the OECD<sup>12</sup> subsidies. They were leading to over production, food being dumped in sub-Saharan Africa so the local farmer could not be competitive. The CAP Reform now is moving in the right direction of what I call multi-functionality of agriculture. That is to say, farmers should be paid not only for producing food but maintaining the ecosystem services, maintaining the soil, maintaining clean water, and so I think we are going in the right direction now to recognise that we have to integrate biodiversity, ecosystem services into, and pay farmers for, protecting and maintaining these services that are so essential; but the fundamental OECD subsidies were having a major adverse effect on food production, especially in sub-Saharan Africa.

**Q546 Mr Williams:** The Chatham House submission to the Committee said that one of the roles that Defra could play was to help to secure a thriving UK food system and would be providing a risk management framework through which short, medium and long-term risks to food security could be monitored and managed. What are the main risks? You have said that, basically, food security is not an issue in Britain at the moment, but what would be the main risks in the future to the supply of food to the UK?

**Hilary Benn:** I think in the short-term—I alluded to some of them earlier—you could have fuel shortages, you could have panic buying, you could have drought here. Medium and longer-term risks: climate change we have talked about, pests, diseases. There is an example of a changing climate changing the risk. What is going to happen to temperature and what increased temperature does to yield? I think there was some evidence, in the very hot summer of 2003, that we saw, in some parts of Europe, yields declining because once the temperature gets over a certain level you do not get so much. The way in which the world market operates: if other countries

<sup>12</sup> Organisation for Economic Co-Operation and Development

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7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

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were to say, “Right we are going to have export bans on a more regular basis”, or, “We are going to go for self-sufficiency”, then I think we really are in big trouble in those circumstances. I suppose the answer to the Chatham House suggestion is, indeed, the assessment of UK food security, because it is looking at all of these things, short, medium and long-term. I wonder, Susanna, whether you want to say a word about that, because it is, I think, a pretty impressive piece of work. It is in progress and you will see the result when we publish it.

**Ms May:** It is work in progress at the moment. What it is trying to do is to map all of the main risks, but there are so many potential risks to food security that what we are really trying to do is capture how resilient the food system is to the different risks. We want to assess what the risks are, then look at how they are being managed by different sectors—sometimes it is for government, sometimes it is for other stakeholders—and then also look at whether or not there are any gaps there and, therefore, what additional action might need to be taken, but because it tries to capture what food security actually is, there is a high level compendium of evidence and it is looking, or will look, at lots of different themes which try and capture all the different dimensions of food security. It is a large piece of work and, as I say, at the moment work in progress, but we want to try and provide a framework within which we can actually think about food security as a problem and then prioritise what action needs to be taken.

**Q547 Chairman:** Does that work include both flows of food into the United Kingdom as well as our indigenous production?

**Ms May:** It is looking at UK food security but, because our food security is so closely tied with global food security, it does include within it as a theme global availability of food supply, yes, and global sustainability of supply.

**Q548 Mr Williams:** Will it include some analysis of political instability in some of the major food producing countries?

**Ms May:** At the moment it is not finalised.

**Hilary Benn:** It is a very good question. It is intended to be a framework, if you can look through a framework, which will help us to see what it is that needs to be done, but it will not be a one-off, because as circumstances change, obviously, we are going to have to look at it and say, “We have got a problem here. What are we going to do about it?”, and, sure, political instability will be a factor, because that may result from problems of food in a country which may lead to an export ban, which may impact on a source of supply that we traditionally relied upon.

**Q549 Mr Williams:** But if we do not do something to address this problem, there could be food riots in various countries, and those sorts of issues, that would really have some effect on food security in this country.

**Hilary Benn:** That is true. At one end of the spectrum, when there was a drought in Australia it had an impact on bread prices here. That is one example of interdependence. If you have got a particular crop or product that we buy a lot of and it is not available any more because there is a problem in the country, then we have got a difficulty too, and that is why, in the end, it is about the world working together to make sure that we have got enough food.

**Q550 Mr Williams:** This is the main way you are monitoring risk at the moment.

**Hilary Benn:** Yes.

**Q551 Mr Williams:** When do you expect to complete the work?

**Hilary Benn:** We will probably publish in the autumn. We were having some debate about whether it would be before the summer break or after. It will probably be more likely in the autumn, because we hope to try and get it right and maybe have it alongside the vision and the plan. We have not, to be honest, quite decided in what order to bring them out.

**Q552 David Taylor:** The nexus between your last job and this one was probably Doha, and in the Doha Round there has been action taken against import bans but little, if anything, in relation to export controls. This seems to have triggered a process whereby countries have been buying up huge areas of land in Africa and Asia. I seem to recall about 25 million hectares, which is an area of agricultural land within Germany. Does this imbalance our desire to have secure food supplies? Are we part of that? Are there very many British organisations acquiring land abroad?

**Hilary Benn:** It is a sign of some countries thinking, “What are we going to do to ensure our food security?” It follows the search for raw materials. If you look at China and other countries in Africa buying up contracts, in the end it is for the government of a country to regulate who is able to buy land. If a government said, “Yes, that is okay; you can buy it”, and then times get tough and the food that is being grown on that land is being shipped out of the country to feed other people and the people of that country are saying, “What about us?”, then you could see that you have a difficulty. Fundamentally it is a contractual relationship between the owner of the land, the government that regulates and the country that is seeking to purchase it, and I cannot conceive how you would have a system internationally for seeking to regulate it. I am not suggesting that we should, although one or two people have asked the question, but it is a sign of the times.

**Q553 David Taylor:** You are fairly sanguine about it.

**Hilary Benn:** Let me put it this way. The chances of trying to regulate internationally those kinds of decisions, any more than one can regulate

7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

internationally contracts signed between one country and another to buy raw materials, or others, I think would be quite difficult.

**Q554 Mr Drew:** Hilary, you have already mentioned the issue of water, soil quality and the way in which that impacts on the whole of our world. By implication, you would be in favour of moving to a low input form of agriculture. I would just be interested in what is the vision for Defra to set the strategy up for our farming industry to be able to pursue that?

**Hilary Benn:** It is partly a question of research. Defra is spending about, from memory, five million pounds a year on soil and water research. We are going to publish what we are calling our Soil Strategy, which is about trying to protect against degradation and encourage people to manage the soil properly. We have changed the arrangements to do with the Soil Protection Review actually to give farmers greater responsibility, this is following the Health Check, because I was a bit amazed when I came into this job and discovered that I needed to take a decision to allow farmers (going back to Ms McIntosh's question) to go onto their land when it is waterlogged in order to try and retrieve the crops which may have been damaged or may not; and we have now transferred the responsibility for taking that decision to farmers rather than me having to sign a bit of paper saying, "You can do it." I think that is quite a sensible change. We are giving advice on the use of fertilisers. We have produced a guide. I cannot remember the name of it.

**Ms May:** *The Fertiliser Manual.*

**Hilary Benn:** *The Fertiliser Manual*, which is for farmers, which we are in the process of updating, but fundamentally it will be about farmers thinking how they can use less fertiliser, how they can manage water better, hang onto it when it is falling out of the sky, because we are likely to have wetter winters, so that you can use it when it is not falling out of the sky in the dryer summers that we are going to have—because that is what the scientists are telling us—and also trying to develop varieties of plants which can cope with, in particular, less water.

**Professor Watson:** Just this morning I had a meeting with Don Curry, who I think might be sitting in the back here today, with Natural England, the Environment Agency and the Royal Agricultural Society on the very issue of soil and water research, and we have agreed we are going to do an analysis of what information is needed to manage our soil and water better, what information do we already have, is it being used appropriately, what are the gaps in our knowledge, and we have already agreed that we are going to jointly do a gap analysis, bring in the private sector, bring in NFU, then hold a workshop to see how we can move this agenda forward basically. That was the meeting we had literally just this morning, but when you get on to research later, we have got a whole series of LINK projects, so they are collaborative projects between Defra and the private sector, that are looking at things like water use efficiency, nitrogen use efficiency. Clearly, just because of the cost of fertilisers, the cost of

pesticides, we need to think about integrated pest management, integrated natural resource management. It makes eminent sense.

**Q555 Chairman:** Out of idle curiosity, why are you having to do all of this almost afresh when Rothamsted have been doing it for goodness knows how long and they have got this new project to probe, if you like, the DNA of the soil? There seem to be an awful lot they are doing on this already.

**Professor Watson:** Absolutely, and so the question is: is there still a gap? Have we got all the right programmes now or is there a gap in the research, and where should the priorities be? So it is not starting from scratch; it is building upon what we have already got.

**Q556 Miss McIntosh:** Secretary of State, you talked earlier about nitrates existing naturally in the soil to a high level. I would argue that the EU Directive was wrong on the level it set for the nitrates as well, and you mentioned the pesticide, that we lost the argument there. What can we do, on the basis of sound scientific knowledge, to persuade Europe when they do get it wrong, because it is crippling the farming community to apply those?

**Hilary Benn:** I can claim no credit for the Nitrates Directive. Those who agreed it at the time no doubt thought it was a good idea. I think if you were doing it afresh, it would look rather different, but there is undoubtedly a problem of nitrates getting into the water courses and something has to be done about it. I think the best way to deal with it is to have a decent impact assessment, and in the case of the pesticides regulation, frankly, there has not been a decent impact assessment. We did it through the Pesticide Safety Directorate and the Commission did not do it. I think it is absolutely fundamental, as we take these decisions, that we know the consequence, and my particular complaint about the pesticides regulation was we were being asked to sign up to something when we did not actually know what the consequence would be because no-one could answer the question in the case of the triazoles I mentioned earlier. Will these continue to be available or not? The answer is we will not know until later, and yet we are being asked to sign up to a process that could rule out something that we do need to treat a disease that affects wheat.

**Professor Watson:** Even worse, there is a philosophical shift with respect to pesticides in Europe of moving away from a risk-based approach to a hazards-based approach. If you use a hazards-based approach, we should not have any electricity in this room; we probably should not be having water, because we might drown in it. Basically, it is a philosophical shift that really worries me. Fundamentally it is wrong. It should be a risk-based approach so that you look at the risks and the benefits, because if we go in general to a hazards-based approach we are going to ban most things. John Beddington, as a scientist, has been trying to lead the charge, but one of the fundamental problems is not every European country has a chief scientific adviser for him to talk to. The European

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7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

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Commission does not have a chief scientific adviser. John is trying to find out how we can actually make sure that we have got people to talk to in Europe about the fact that this is a wrong-headed policy and philosophy as well as, obviously, ministers in different countries having a debate. So this is actually a very worrying trend, and the triazoles could be the tip of the iceberg if we are not careful.

**Q557 Mr Drew:** I was going to talk a bit about soil, but the Chairman has stolen my thunder there, so I will stick to something else: the contribution that we should be making in the area of agriculture to greenhouse gas reduction. Given that we know that it was one of the sticking points over Kyoto, when we go to Copenhagen, and whatever follows that, what contribution is British agriculture going to be asked to make and what will we now expect from the rest of the world in the agricultural field to bear down on greenhouse gas emissions?

**Hilary Benn:** It is a really important question actually. Why? Because about 7% of our greenhouse gas emissions in the UK come from agriculture—and 14% of global emissions. So the idea that we are going to get the levels down without agriculture making a contribution is really a non-runner, and you will know, Mr Drew, that the Climate Change Committee had some things to say about agriculture's contribution when it produced its report, and the Government is currently looking, having adopted the carbon budgets, at what the plan is going to be for making sure that we achieve those. The short answer is that agriculture is going to have to play its part. We have a bit of a difficulty at the moment, which is that the two measures that are used to look at greenhouse gas emissions from agriculture under the UNFCCC<sup>13</sup> is (1) livestock numbers and (2) inputs. Now we are going to have to have a more sophisticated way of doing this, that is the first point that I would make, but you have to have decent scientific evidence about the impact that ways of feeding cattle, for example, will have on the emissions which result from them in order for that to be accepted as a decent way of counting. In the end I think it is both a challenge for farmers and land managers to look at this. The obvious areas are afforestation on land, the way in which you fuel and run your tractors and machinery because you can make carbon and greenhouse savings there, there may be something about the way in which soil is managed, there will certainly be savings that can be derived from the way in which fertiliser is used, much more selective use of fertiliser will reduce the emissions, but it is also, if you think a bit further ahead, an opportunity for farmers and land managers to say to the rest of the economy, "Hey, we can help you to deal with carbon. So you give me some money which I will then use to plant some trees over here and that helps you to achieve your carbon budget". I think it is an opportunity if we see it in that way and peat bogs are a really good example of that because the way in which you manage your peat bogs can either help them to hold carbon and

greenhouse gases or emit a lot of it into the atmosphere, principally by keeping them wet as we know.

**Q558 Mr Drew:** Let us go on to water finally. A specific question: to what extent is the Floods and Water Bill an opportunity to be quite radical in this area? I am not saying it is at the moment, but we were told yesterday there are degrees and ways in which we can hang some more things on the coat hanger. Is there an opportunity here to look at how we use water in an agricultural sense more efficiently and more effectively by looking at that Bill to set the parameters more fundamentally?

**Hilary Benn:** It certainly is intended to be an opportunity. Let us take a practical example: abstraction licences. Now, a lot of agriculture will make use of abstraction of water and we have to make sure that abstraction is sustainable because if we do not do that then we have quite a fundamental problem. As a society as a whole we are going to have to look after and use water much more efficiently, both as householders and elsewhere, although if we do have more rain in the winter to what extent will it be possible to hang onto it, to harvest the water, and I think that will lead to some change in the way in which farmers use their land because if there is a way in which you can catch it in a pond and then use it in the summer, I think that is one of the changes we are likely to see.

**Professor Watson:** The issue of water globally is clearly probably the most fundamental issue we have got, that goes without saying. It is also going to be a major issue within the UK. We already know that all the projections of the implications of climate change are indeed, as Hilary said, wetter winters and much drier summers, and therefore the challenge will be how do we do things such as water storage. One has to obviously think through the approaches of water pricing policies. We have to think about the whole issue of embedded water. When we buy and sell produce abroad, it is embedded water basically. These issues are absolutely fundamental. That is why water use efficiency on plants is absolutely crucial, how can we have precision irrigation so we use precisely the amount of water we need, so absolutely central domestically and an even bigger issue internationally.

**Q559 Chairman:** Let us move on to research and development. I had hoped my colleague, Lynne Jones, would be here to take up the questioning but sadly I think she has been detained elsewhere. Professor Kell, the Chief Executive of BBSRC,<sup>14</sup> made under the current circumstances what one might call a challenging statement when he called for an investment in agricultural science to be increased by £100 million in order to improve food security. Can I ask Professor Watson, do you recognise that as a valid statement because I am also aware that Professor Beddington has commented that within Defra there has been a decline in the Department's budget for food based issues. Certainly on the

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<sup>13</sup> United Nations Framework Convention for Climate Change

<sup>14</sup> Biotechnology and Biological Sciences Research Council

7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

Committee's recent trip to Brazil we picked up quite a lot of mood music that there was an acknowledgement within the UK of the need for more expenditure in the field of science for agriculture if we were going to tackle the challenges of long-term food security.

**Professor Watson:** This is one of the issues that we have talked about jointly as CSA, so not just John, myself, Gordon Conway from DFID,<sup>15</sup> we have also met with all the chief executives of the Research Councils, so not just Doug Kell from BBSRC. We would argue that one of the areas that does need attention is further investment and if it were to be available we would put food and water security as one of our higher priority. Within the Living with Environmental Change programme, which currently has 17 partners, about to be 18 when DE<sup>16</sup> CC comes on board, one of those objectives is food and water security, others are climate change, biodiversity, et cetera. We would argue that is the one area that should actually be given serious consideration for an uplift, our reason being simply the challenge we have talked about. How does the world double food production? How do you do it environmentally sustainably? What are the challenges of managing water? We realise this is a very major issue. Doug Kell probably might argue that this should be a new standalone, our food security programme, the alternative is to embed it further in Living with Environmental Change.

**Q560 Chairman:** Let us get down to the nitty gritty. You have elegantly summarised the research priority areas that you think Defra needs to be looking at. How are you going to translate those aspirations into reality? I say that against the background that the Committee in the course of its work has been to John Innes, we have been to Rothamsted, to get a flavour of the scientific challenge in the work that is currently being undertaken. I think that the concern we have is that if you take Cristiano Ronaldo, if you were going to go out and buy him, he would cost you about £90 million if you were lucky enough to have your bid accepted, or Mr Tevez might cost you about £25 million, when you look at the kind of budgets that places like John Innes have got, and the importance of the work they do, we seem to have got things slightly out of kilter where you get more bang for your buck with footballers than you do in terms of spending on the very foodstuff that affects all of us. Against that kind of background, what are you doing to translate aspiration into reality?

**Professor Watson:** First, it is not just an issue for Defra, it is clearly a joined-up programme between Defra and Research Councils, not just BBSRC but NERC<sup>17</sup> as well, also the Economic and Social Research Council, there are a huge number of behavioural issues. We need to bring in the Technology Strategy Board and the private sector itself. This is why John Beddington has put together the group that cuts right across the Research Councils and government departments and the

private sector and we are collectively asking, "What are the major challenges within agriculture and food? What research do we already have that is ongoing? Supply some of these answers. Where are the research gaps and, therefore, where are the relative roles and responsibilities?" In reality agriculture is often viewed as different from other sectors. If you were asking the question on energy, pharmaceuticals, communications, computers, "What is the role of Government", you would probably come up with a very different answer for agriculture. We are trying to look at the issue, to what degree is the role of the public sector and what is the role of the private sector and how do we have joined-up programmes, the LINK programmes, bringing in the Technology Strategy Board for potentially a new innovation. That is exactly why we are meeting.

**Q561 Chairman:** What would be helpful would be not to necessarily go into the detail now but perhaps you could drop us a note and lay down the work the programmes which are going on and give us an indication of the timetable when these various pieces of work are likely to report. Does it also take into account the retention of the skills base? In our trip in Brazil we were impressed by their state funded Embrapa service for agricultural research. These guys take it very seriously, but they also recognise with the LABEX arrangements the skills that we have here. Are we going to make certain we are going to hang on to the skills which we have got which are internationally recognised but which can so easily be lost sometimes in the frail world of funding for research projects?

**Professor Watson:** No, in fact it is a key issue. I think that is one of the analyses which needs to be carefully conducted as part of our work and that is what is the skills base we need, why do we have it and one of the arguments, especially from the commercial farmers group, is that we have lost and eroded significantly in the UK over the last couple of decades expertise in soils research, for example, that is one of the reasons we met this morning and had a discussion, but also in the more translational research, the more applied part of research. It is not favoured in the universities, it does not attract those people; it has dropped off many of the Government research organisations, the private sector seems to be weak, so when we look at not only what research needs to be done, we are going to look at where is that research based and do we have to rebuild some of that research base. It is absolutely the right question and that is why we are meeting together to try and evaluate these extremely important topics.

**Q562 Chairman:** What you have said resonates with much of the information we have received so, Secretary of State, you are going to have to be the champion of this agenda and you are going to have to fight your corner at a very difficult time when it comes to the use of public funds. How are you going to win the battle to ensure that the right level of

<sup>15</sup> Department for International Development.

<sup>16</sup> Department of Energy and Climate Change

<sup>17</sup> Natural Environment Research Council

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7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

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resources is going to be made available to pick up both the challenges and opportunities that Professor Watson has laid before us?

**Hilary Benn:** To advance the argument as to why this is important and necessary. I would just say by way of context that it is not terribly easy to get information about international comparisons but Eurostat has produced some figures which actually show that what they describe as appropriations for R&D<sup>18</sup> and agricultural production and technology, the latest figures they have got are 2005, the sum in euros in the UK is actually higher than in Germany, France and Spain. That is just a bit of context. In terms of the proportion of total R&D investment, it seems to show that in the UK it is higher than in France, Germany and the United States of America. To be honest, I do not know in detail what the basis for the putting of those stats together was but just I think a little bit of context is important if there is an impression out there that the UK is not doing anything and everybody else is doing a lot, firstly. Secondly, the Technology Strategy Board, which Bob mentioned, has got some more money now as a result of the Budget and, bluntly, one of the arguments that we are making is that in addition to the priorities they have already identified a food and innovation priority should also be part of their work, and those discussions are taking place as we speak. Thirdly, the BBSRC, coming back to your original question about Professor Kell's observations, has actually been increasing its investment in this and in the end there is the Defra spend, there is the BBSRC spend, there are other sources. It matters less precisely what the balance is between the lot; it matters more what the quantum is and the nature of the research that is being undertaken. The final point I would make is to echo Bob's observation that there is a question about what contribution the industry, and those who take the benefits of the industry, should make. I was reading with interest the transcript of your evidence session with one of the supermarkets when that was, as I recall, a question that you put because, Bob is right, in other sectors people would be making a contribution to research, and I think there is a genuine debate to be had about what the contribution from the private sector to this should be above and beyond what is already coming forward, particularly through the levy which is helping to fund some of the LINK work that Bob referred to.

**Q563 Chairman:** Can you just help us to understand because, if you like, there seem to be a number of people setting the agenda for scientific work in the food and farming area and inevitably in a conversation like this we concentrate on matters which are connected with the production of food from the point of view of the primary producer, but there is also a massive food industry which is central to food security as well. Obviously I have pressed a button, Professor Watson, respond.

**Professor Watson:** In the meeting John had we had either Sainsbury's or Marks & Spencer, I forget which of the two, we had Pepsi-Cola there and so we actually are looking along the food chain. Our challenge, or John's challenge should I say—it is his group—was who do you have at the table to make it a manageable debate. So what we are now looking at is what are the various segments we should look at. There is the agricultural production, there is then the whole issue along the commodity chain and we will put together, or John and his team will put together, a group of sub-groups that looks all the way right down to the supermarkets to see what information, what research, needs to be done. When John had his first meeting and brought in the private sector, it was with a wide spectrum of the private sector so it had the NFU there, it had one of the big supermarkets there, it had groups such as Pepsi-Cola et cetera, because we do want to look right along the food chain.

**Q564 Chairman:** Are you going to address the question that having identified the areas where work needs to be done to address that agenda that that work can be sustained because some of the scientific work you are going to do is not going to be done overnight, it needs a long period of time, analysis, appraisal, et cetera? The science fraternity needs to know it has got a security of funding if that kind of work is going to be sustained and also we are going to retain the scientists. Is that an issue you are addressing?

**Professor Watson:** Through John what we are going to have to do is demonstrate and make the case for additional research in competition with all other issues, both other research areas and other non-research areas. If indeed there were to be a need to increase funding, we are going to have to make the case for it within the current research budget or, if it is for additional resources, against other things and that will therefore depend on making a case to Treasury that this indeed makes sense. It is a major challenge. It is exactly the same challenge in all other fields.

**Q565 Chairman:** You mentioned just briefly the transitional part of the work which is very important and if there has been a criticism it is that after the Barnes Review many years ago we veered too far towards what I might call the blue sky fundamental science and not enough in terms of being able to put the results of scientific experiment into practice. Could you say a word about what Defra is currently funding in the transitional field and in the context of LINK, which if you like is seemingly our best vehicle at the moment for bridging that gap. One of the criticisms is that whilst LINK is accessible to the big enterprise, it is not to the small enterprise, and agriculture inevitably is made up of a spectrum of sizes of enterprise, all of which can make an important contribution to the food supply in the country. How are you going to address those issues?

**Professor Watson:** The second one I cannot particularly address because I am not familiar with it but I can get back with more information to you

<sup>18</sup> Research and Development



7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

on the issue of size and the capability of linking into LINK. I will give you a couple of examples of things we are doing, but what I think might be very useful is to send you a list of some of the recently completed projects and some we have got ongoing. Some of the LINK projects, for example, are sustainable improvement of vegetable quality, water nutrient use efficiency, we are looking at it in vegetables, I see it to do with forage for livestock, genetic improvement networks in wheat, oilseed, rape, pulses, vegetables, so again nitrogen use efficiency, disease resistance, a whole series of projects in livestock and dairy. I think the most efficient thing would be to send you a list of these projects, some have been completed, some are ongoing, so you can see for yourself the types of things that we are looking at basically right across the whole spectrum, including some on animal health and welfare. Obviously as we have also said, we are working with Iain Gray and his staff at the Technology Strategy Board to see if we can come up with an innovation programme again so we can be at the cutting edge. To be quite honest, I had heard this criticism, and understand the criticism, but when I started to look at what we are doing in Defra through the LINK project, there is far more translational research than I thought was going on. What of course we did, and it was a very purposeful decision, was to get out of directly production related research into things such as agriculture and climate change. How do we have a more resilient farming system, more sustainable water management, largely public good, but direct information will help the farmer. I think this is why we need to work out what is the role of BBSRC. Should they stay blue sky or should they also move towards the translational research? What is the role of Defra? Is it more the global public goods or the public goods issue of water management, the issue of climate change, both how can you mitigate from the agricultural sector and how do you adapt to it? How do you have a resilient food chain all the way along? What is the role of the levy boards? This is the very reason we are trying to see what are the roles of each of the organisations and to what degree should the private sector step up to the plate versus to what degree does the public sector need to step up to the plate.

**Q566 Chairman:** Within that, will that refine the way in which the priorities are ultimately going to be set for what you deem to be the essential research? One of the things I have struggled to fully understand is that with BBSRC in the driving seat how do you at Defra get the things done that you think should be done? In other words, who sets the priorities?

**Hilary Benn:** From my point of view, the benefit of the group that has been established is precisely that all of those who have an interest can look right across the piece and address those questions and form a view about priorities. Like Bob, I must confess when I saw this list, the charge that was there, Defra does not do any of this any more, self-evidently is not the case because it is quite a long list, and we will send it to you. I think, Chairman, you have raised a very important point about how the

product of this research is then applied. One of the things we did with the DFID research programme as part of the research contract was to try and build in a responsibility to get it out there. It is something that I think it would be useful to look at. There are lots of ways in which you can do it. It could be an article in *Farmers Weekly*. It could be networks of farmers. You could be working with the agronomists that a lot of farmers will be seeing on a very regular basis. I think we need to think creatively about how we can take the product of the research because in the end it will be whether it is applied on the ground, hence my earlier comment about what farmers do will be really important, that will make the difference and will really justify rightly what we are putting into this.

**Professor Watson:** The other comment I would make is if you look at the pure agricultural research spend it is not very different between Defra and BBSRC. This is why it has to be a joint activity, talking to the end users, the stakeholders, of what is the relevant research. For example, the Defra agricultural spend this year is around £65 million and the BBSRC spend is about £80 million, so they are not that far different basically. Then there is the Defra LINK programme, the additional money from LINK of another £8.2 million so when you look at the spend between BBSRC and Defra, they are actually relatively comparable basically. That is why we need to work as partners, whether one is bigger or smaller than the other, and with NERC and the other entities.

**Q567 Chairman:** Can we just move to a brief discussion of one of the potentially key technologies in the future in terms of GM.<sup>19</sup> I am aware for various reasons, both national and European, that the proper evaluation of this science has moved at a very sedentary pace. Parking for a moment the argument as to whether you are for it or against it, perhaps you might just tell us what is the official Defra position as far as GM is concerned, both from the crop production point of view and its use within foodstuffs for both human and animal consumption and whether there are any GM technology programmes which Defra is currently involved in funding?

**Hilary Benn:** In answer to the second, BBSRC, so it is Government funding, is funding £11.3 million of research that uses GM crops or is of direct relevance to new crops. What is the Defra position? Government has, it seems to me, two responsibilities, one is food produced by GM safe to eat, and I know of no evidence that it is not, and, secondly, is it safe to “grow”, in other words what is the environmental impact of it? Now, in order to be able to answer the second question you need to be able to do trials and as I think you and I, Chairman, have discussed before it is a source of real frustration to me and to others that there are some who do not want to allow us even to find the answer to the question. I have only approved one trial, as I recall, because it is the only one that has come to me, that was the University of Leeds, it was trying to develop

<sup>19</sup> Genetic Modification

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7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

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a breed of potato that is resistant to nematode. I authorised it, it got trashed in a couple of months, something like that. It is really hard to answer the question. Now, ultimately, farmers will decide what to plant. There is a European regulatory system in place. My view is we are going to need all of the means at our disposal to deal with the problem that we are sitting here this afternoon discussing. I do not know the answer to the question, is it going to come up with better varieties, more drought resistant nitrogen fixing, vitamin A fixing to improve people's diet kind of products, but we ought to look at the evidence and to judge it on the basis of facts and that is Defra's position, and it has been mine even before I took up this job.

**Professor Watson:** Clearly it should be a risk benefit analysis. I think what we should ask ourselves is what is the problem we are trying to solve. The problem today clearly is a billion hungry people and an agricultural sector that has had major successes but has led to some environmental degradation in different parts of the world. When someone says to me why have we got hunger and famine today in Africa, it is not because we do not have GM, it is nothing to do with that. We can double, triple, quadruple agricultural productivity in Africa tomorrow morning if we put it in a full rural development context, and Hilary has already said it, access to better traits are already available, access to appropriate amounts of fertilisers, pesticides, access to financing roads to get to markets and a better trade system. Then when someone says, "What about the future? We have got to double food production in environmentally and socially sustainable areas and with the challenge of our climate change how do we develop more drought, temperature, salinity and pest resistant crops? How do we use the nitrogen more efficiently?", there I think it could well be that we need the full range of all technologies and practices that are available today and may become available tomorrow. We need a research programme coupled exactly with what Hilary says, field trials that are not trashed to look at the potential of the full range of technologies. I think that is clearly where we need to go. We need to clearly work with the private sector. The public does not trust anybody at the moment in Europe on the issue of GM and so we have to build trust in society effectively that the research is done and the field trials that are done are above reproach, they are open and are transparent. To be quite honest, at the end of the day I think for the average European consumer, the consumer has to see a benefit, it is not just the farmers seeing the benefit but will there be a benefit in either quality or food price and that is one of the big issues.

**Q568 Chairman:** That is a wonderful aspirational series of remarks. It is the sort of peroration of a really good speech that you are going to make somewhere. I am intrigued to know how Defra—given that this is an important technology which does need to be evaluated—is going to translate that

aspiration into reality. Are you working out a plan within the context both of the UK and Europe to say we have been thwarted so far in being able to evaluate this technology, this is what we are going to do to address the frustrations and make it happen?

**Hilary Benn:** To be very practical, one frustration in Europe is importing new varieties of GM products, principally for animal feed. We have said in Europe we think the process is too slow. We have said, "Look if the evidence is clear that this is fine", and lots of people are eating meat that has been fed on GM soya, lots, indeed there is now a price differential emerging, it is more difficult to get non-GM soya to feed livestock so that is one of the ways, I think Bob is right, in which it will become a real choice for people. That is the first thing. Secondly, Europe has approved two GM crops for growing, one I am not sure is made anymore and you are left with MON 810 as I think it is called. It is not grown in the UK, although there was a farmer I think in Wales who said he had grown some.

**Mr Drew:** In Roger's constituency.

**Q569 Mr Williams:** Yes.

**Hilary Benn:** It was not in yours, was it? You should do it on the basis of the evidence, frankly. Those are two practical things that we have done. Go with the science, go with the evidence, form a view. Bob is right, because there is a sort of maelstrom of concern and fear about this we need to get the facts out. That is why I am a great believer in the facts and why you should go with the science, but ultimately people will decide what they plant and what they eat and what they stock in their supermarkets.

**Q570 Chairman:** Yes, but you still have not answered my fundamental question. You said on the potato trial it was trashed within two months and again, parking for a moment whether you personally agree or disagree with the technology, what we seem to be lacking is a methodology to carry out the necessary evaluatory work to see if it is worth doing it or not in the real world. I have not got an answer to that.

**Hilary Benn:** One option is to try and better protect the trial sites, so you can have a fence, and those who are sponsoring the trials obviously have to think about how can we be sure we get the answer given all the hard work that we have put in. You could have particular sites where you do it or you provide protection. My view is I think it is important that we get the answer. My job is to take a decision about whether to authorise trials when they come to me. It is for those who are sponsoring them to try and ensure, and we need to support it where we need to, that they can be completed, we can get the answer, then the information should be open and publicly available and hopefully we can have a common rational debate about what this technology may offer us or may not depending on what the science and the facts show us.

**Q571 Mr Drew:** I was going to make that point, which you already exemplified, that people are now eating it. I am a non-GM person, as you probably

7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

already know, but people are already eating in great numbers now meat products raised on GM. I think the debate does need to move on now. I have never been against the application of GM technology, I am against the application of GM food which I think is still different. I think it is about time we did have a proper debate in this country and looked at all the whys and wherefores. Bob's fact about not being trusted, maybe there would be some trust if there was some honesty now in the way that this debate is taken forward.

**Hilary Benn:** I for one would welcome that. The answer I gave you, Chairman, to your question about what is Defra's view and what is my view is what I have been saying since I came into this job, but others have to play a part. We have to overcome the well of suspicion that there is some quarters and facts and evidence is a really good basis on which to have that conversation. If and when the new products come along then you have got a choice because at the moment part of the difficulty is that it is a bit of a theoretical conversation, well it might and it might not. When it comes along and says, "Right, we could have a better variety here. This will help you to manage with less rainfall in the summer" then people will be saying, "Well, do I want to go with this" and the nature of the debate will change. That is my view.

**Professor Watson:** The comment I would make is I think the industry grossly over-promised 10/15 years ago. If you now look around the world there are only four crops that are in large scale production anywhere in the world, predominantly of course in the US and Argentina: soy, maize, cotton and canola. It is primarily pest-resistant, herbicide-resistant. I think there is potential for this nitrogen-use efficiency, water-use efficiency, but until the public see potential benefits to them it is going to be a debate. Let us be quite candid, there is a difference of opinion on this issue between England and Scotland where the Scottish Parliament clearly is very anti—at the moment—GM. There is a debate even across the United Kingdom as to where we sit, and a very virulent debate across Europe.

**Q572 Chairman:** Talking about Europe, can we move the questioning to quite a challenging area. Secretary of State, I think you are well-placed to respond to it. We are limbering up now to the early exchanges about the further reform of the Common Agricultural Policy. We have got used to the outcome of the health check, but the policies towards agriculture in Europe are going to set the framework within which the United Kingdom will have to operate in meeting the challenges that it is setting itself to ensure that we have a robust and secure supply of food for the future. There are many different views still in Europe about the purpose and direction of agriculture, and the policies that surround it, and sometimes they seem to be—as we discussed a bit—disconnected from the real world and certainly the massive food industry that relies on agriculture's output. Would you like to give us

perhaps an early indication of the role that you think Defra can play in helping to shape this future European Union policy towards agriculture in the future?

**Hilary Benn:** We have been longstanding advocates of the shift from Pillar 1 to Pillar 2, apart from the reasons that Bob set out a little earlier, supporting farmers for the things that the market does not reward them for. Longstanding advocates, as a result of that, of moving away from coupled payments. Now, there is a group within Europe that take that general view and there is a group of other Member States who do not agree with that view and the wrestling over this will continue in the next stage of the process of reform having played quite an important part in the health check itself where I would sum up as we made some reasonable progress, one or two steps backwards but it was I think a further, if modest, step along the way. What I think has yet to come in to the debate is how all of the things that we have been discussing this afternoon will impact upon what kind of Common Agricultural Policy we are going to have in the future. It may be about what cross-compliance is going to look like when thinking about how we manage the resources that we have got. There will be some who will argue, Chairman, as I indicated earlier, that we should be going back to where we were because that is a way of getting more food produced. The other issue, of course, is going to be how much money does Europe want to spend on the CAP as opposed to anything else which is going to frame the whole of the debate.

**Q573 Chairman:** But the one bit of the framework which does not seem to have caught up with where we are today in the 21<sup>st</sup> century is the Treaty. The definition of what is the Common Agricultural Policy in the Treaty does not recognise climate change or sustainability, for example. If you fell back and said, "Well, we are going to do what the Treaty says" we would not even be having this conversation.

**Hilary Benn:** No, that is true and, bluntly, it is a challenge for us but it is also a challenge for Europe for policies to catch up with what it is that we are having to deal with. That is why we have the debate about pesticides and the electronic identification of sheep, as two examples on the regulatory side, or, in a completely different context, how do we balance the renewable energy targets that Europe has set with the Habitats Directive that we have got because sometimes they might come into conflict. I think the task for Europe, to answer your question, and the contribution that Defra can make, is to say, "Look, we have to work into the decisions that we are going to take about the future of the Common Agricultural Policy these understandings and these insights about food security and sustainable food production and come up with policies which help us to achieve both".

**Q574 Chairman:** Does it mean that we are going to also have to address the question of natural advantage and specialisation because when we

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7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

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visited Rothamsted one of the views that was put to us was, "Europe is going to be a very important part of the globe in the future. If climate change comes as predicted then we will see an increase in temperature but we will still be able to do a lot of things agriculturally that perhaps other parts of the world which may face more extreme conditions will not be able to", it is a question of how you exercise your responsibility, given your natural advantage, and the view was you should pull all the stops out to maximise production because you have a responsibility to do that because of where you are. Phraseology like that has almost a sort of command and control feel about it, but the direction of the CAP is moving much more towards market-based decision making from the primary producer's point of view. Are those two thought processes reconcilable?

**Hilary Benn:** It is a very interesting question. To some extent, of course, what is grown in Europe is going to depend on what you can grow and that is going to change so a natural advantage will naturally appear as a result of the climate change that happens and how we can manage to continue to grow some things or grow new things with reduced inputs and less water in the summer. Secondly I think price will be a very important factor in pushing all of this because if we are successful that will have one impact on price in the world, because a lot of these products are globally traded, and if we are not successful in producing more food from wherever then the price is going to go up and that will send a signal. Now, whether it will be the case that Europe has a special responsibility because it will be the part of the world where more food can be grown because of climatic conditions is something that we will have to think about and address. Europe on its own clearly cannot do this and that is why we cannot lose sight, as part of not formally the Common Agricultural Policy but Europe's contribution to increasing food production for the global agricultural policy, if I may use that term, in playing its part in supporting all of the changes that in the end countries have to make for themselves but making sure that farmers in those places have the means to bring about the kind of agricultural revolution which we have seen in some parts of the world over the last 30/40 years which is why we have crept ahead, as I think I described it in my speech about Malthus, but there is no guarantee that will be the case in the future.

**Professor Watson:** Also, we are going to have to look at Europe very carefully. If we do indeed see these projected climate changes come to realisation and we do not get the good post-Kyoto agreement in Copenhagen, Southern Europe dries badly, the more northerly part of Europe could become wetter and have a slightly longer growing season, so the distribution of food within Europe will change drastically. The other thing where we need to think through policy in a joined-up way is the issue of biofuels. That is a major push in Europe, to go to 10% of all liquid fuels by energy not just by volume by 2020, but where is that land, what are the implications for water? When we think through a

climate change policy, for example renewable energy and biofuels, we have to look at it at the same time as a food policy as well. This is why we need joined-up thinking both within the UK, which there is, and within Europe.

**Hilary Benn:** To add on that, in addition to having the big Foresight project on how is the world going to feed itself, there is also a Foresight project looking at land use in the UK, so that is an additional bit of work that we have put in train.

**Chairman:** Two brief supplementaries from my colleagues and then we will wrap things up.

**Q575 Mr Williams:** I would not necessarily want to be seen as an advocate for recoupling agricultural support, but I think Professor Watson summed up a perfect agricultural policy when he said he wants food cheap enough for the poorest people in the world but of a high enough price so that people could produce it profitably and it is how we get there, is it not? The real problem is that when you produce too much food then the price collapses significantly because very few people want two breakfasts. Some do, but very few people want two breakfasts. If you are not producing enough food then if you have not got enough food today, you are hungry tomorrow and you cannot wait for the market to adjust to produce that extra food. There must be a certain amount of management that has got to take place here because if we just rely on the market then you are either going to have very low prices and primary producers not producing or higher prices and poor people in the world not being able to eat and the market is not going to adjust quickly enough in order to achieve the very excellent agricultural policy that Professor Watson spelt out earlier in the session.

**Hilary Benn:** This is a very lively debate about stocks and what role they might play. We have tried with other commodities in the past holding stocks and releasing them to manage the price, and I think it is fair to say it has not had a terribly successful record. There is discussion about physical stocks and there is discussion about virtual stocks that you could call upon if the need arose. As far as the UK is concerned, at the end of the crop year we hold about 50 days' worth of consumption of cereals, obviously a lot more just after the harvest, potatoes, it is usually about 20 days, it was a bit less more recently. The retailers themselves hold 9 to 12 days' supply in their stores. I remain to be persuaded that building up big stockpiles would help us to manage this but I have got an open mind and we have got some research we are doing trying to understand better what role stocks might play. The market does go up and down, principally determined by the price, but the fundamental task is to get the production up.

**Q576 Mr Drew:** As somebody who is a regular critic of the CAP, if there was ever a need for a CAP now is it because we are having to completely rethink our whole attitude towards agricultural stocks, production and the rest of it. If the Commission was to come to you, Hilary, and say, "We know the UK

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7 May 2009 Hilary Benn MP, Professor Robert Watson and Ms Susanna May

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has got to do more. The decline in the level of self-sufficiency is something you have to address, you have got to turn that round.” This is the Government and targets. What is a realistic target for the UK in terms of its level of self-sufficiency, notwithstanding that would include obviously exports and imports? What is the figure we should be getting to? Let us be realistic, let us give you 10 years to turn that round.

**Hilary Benn:** Given that we are more self-sufficient now than we were in the 1930s and 1950s and did we wake up in a sweat in the middle of the night then about how we were doing, no we did not. That is the first point I would make. Secondly, I do not know how you would determine what an appropriate target was. Thirdly, Europe itself is about 90% self-sufficient. We must not lose sight of the importance of the trading relationships because suppose some terrible disease affected the wheat crop in the UK, if you have just said, “Well, we are going to get our self-sufficiency up, we will be looking after ourselves, we do not have to have those trading relationships with other countries because we will be okay” and then suddenly, wallop, you find you have lost a really important staple crop, you are in trouble. It seems to me that you need both, a strong domestic base, as I set out earlier, and you also need an international trading system but more than anything else you need enough production in the world in order to deal with the problem.

**Q577 Chairman:** Just to follow up David’s point. When you sit and look at the potential for UK agriculture, in other words we have talked a lot about new techniques, new technologies, science research, the need to improve yields, costs, all the rest of it, do you work out any scenarios about what the potential could be? We have a certain balance of the types of crops we produce, part of that is determined by the marketplace, part of it is

determined by the natural environment, what we can do, but if you turn the wick up under UK agriculture, because all of your speeches have been, “We have got to do more, we can do more”, do you sit down in Defra and say, “I wonder what the more would end up at”?

**Hilary Benn:** I have not done that so far. I do not know whether anyone has done any work on that.

**Professor Watson:** I do not know the answer to your question. I would hope that in John Beddington’s Foresight study when he looks at national and global food security he would ask that question. You could ask the question typically if we get eight tonnes per hectare of wheat while the theoretical number is well over 15, I think there is a real possibility of getting to something like 11 or 12 which is probably what you heard from Ian Crute at Rothamsted. I think the question is where are we on productivity today on the major crops, both vegetables as well as cereals, and what does it take to increase that potential in a way that is environmentally sustainable? I would hope that would be part of John’s study, and it has people like Ian, of course, on the expert panel, and I think that is exactly the right sort of question as long as it is not production for the sake of production, it is production that is environmentally sustainable.

**Hilary Benn:** And for which there is a market.

**Q578 Chairman:** That sounds to me like a very good place on which to draw our discussions to a conclusion. May I thank you, Secretary of State, Professor Watson and Susanna May for your contributions. We will look forward to your further thoughts in writing. As always, you cannot undo that which you have said but if there is anything else you feel that we ought to be thinking about, please do not hesitate to put pen to paper. Thank you very much.

**Hilary Benn:** Thank you very much, Chairman. We really do look forward to your report.

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### Supplementary evidence from the Department for Environment, Food and Rural Affairs (SFS 57a)

*The work in that is in train in the group set up by Professor Beddington to cut across the Research Councils, Departments and the private sector, and the timetable for this work (Q561)*

There are three key linked activities:

- Food Research Sub-Group (FRSG)
- Cross-Government Strategy for Food Research and Innovation
- Food Research Partnership (FRP)

Planned timetable

Next meeting of FRSG	2 June 2009
Next meeting of FRP	August 2009
Finalisation and publication of the Strategy	By September 2009

### Food Research Sub-Group

A Food Research Sub-Group of the Food Strategy Taskforce has been established as a recommendation of the report *Food Matters*, published by the Cabinet Office last year. The group is chaired by Professor John Beddington, the Government's Chief Scientific Adviser, and meets quarterly.

The group brings together key public sector funders of food-related research including Research Councils, Non Departmental Public Bodies (NDPBs) and the Devolved Administrations. The group is served by a secretariat with membership from GO-Science, BBSRC, Defra and FSA.

The overall aims for the group are:

- To take forward the recommendation of the *Food Matters* report for a cross-Government Research Strategy for Food.
- To promote the coordination and coherence of food and agricultural research programmes and funding across Departments and the wider public sector.
- To provide a forum where key cross-government food research and innovation issues and priorities can be discussed and addressed.
- To facilitate engagement with the wider stakeholders groups, including research providers, funders and users.

### Cross-Government Strategy for Food Research and Innovation

The first key deliverable of the Food Research Sub-Group is to produce the strategy for food research and innovation envisaged in *Food Matters*. The strategy as scoped will sit across the more detailed strategies of the various funders, concentrating on opportunities to address cross-cutting issues and areas where greater collaboration and joint initiatives between funders to address key gaps will be beneficial. Initial mapping of the food research funding landscape has been carried out to provide underpinning evidence to develop the strategy.

A draft outline of the strategy, setting out the key aims, format and content, was presented and agreed at the second meeting of the sub-group on 24 February. It was agreed to consider specifically the skills base and research infrastructure in the strategy. The secretariat to the FRSG is currently developing the strategy in consultation with key stakeholders across Government.

The FRSG will consider progress at the next meeting on 2 June, in particular the key actions and deliverables in the strategy. Publication of the strategy is planned by September 2009.

A key objective will be to align the development of the strategy with other work across Government, and the other sub-groups of the Food Strategy Taskforce, in particular the sub-group developing a vision for a sustainable food system (led by Defra with FSA and DH).

### Food Research Partnership

As a linked initiative, a Food Research Partnership (FRP) has been established, bringing together senior representatives of the public sector, academics, Non governmental Organisations (NGOs) and industry from across food and agriculture. The public sector membership of the FRP is based on that of the FRSG. The FRP's aims are:

- to provide a high level forum to promote cross-sector dialogue and to jointly deliver enhanced leadership in addressing key strategic issues for food research and innovation;
- to provide the opportunity of a challenge and "sounding board" function as individual organisation strategies and programmes are developed, and in relation to the functioning of the institutional landscape for food research as a whole; and
- to forge links between member organisations, and encourage collaboration and a coherent approach to research across government, the research community and the private sector.

The Partnership will focus where there is an opportunity to change and improve the UK food research and innovation system. Initial areas of focus will be developing proposals to improve the translation of research into use and address the skills and capacity gaps across the food chain, through addressing the following questions:

- *Translation pipeline of research into use*: How can the translation and exploitation of food research be improved, and what is balance of roles between public and private sectors?
- *Skills gaps, capacity problems and improving attitudes to the sector*: Where are the most serious skills and capacity problems, and what further measures could address these and promote more positive attitudes to the agri-food sector?

This work will be taken forward by the members of the FRP with interests in each question, in collaboration with other key stakeholders. It is planned to develop concrete, evidence-based proposals for change for consideration at the next meeting of the FRP in summer 2009. The FRP will consider the merits of the proposals, and the most appropriate routes to their implementation.

*A list of ongoing and recently completed LINK projects (Q565)*

See Annex A.

*How Defra ensures that LINK projects are accessible to smaller companies (Q565)*

LINK originated as a DTI collaborative funding scheme, with a particular aim of encouraging Small to Medium-sized Enterprises (SMEs) to invest in and gain advantage from UK academic research that they would not be able to fund on their own. To be eligible for the 50% Government grant, companies have to show they are financially viable by submitting their accounts; a few very small firms are not prepared to provide these and so have not engaged with LINK. However, on average, one third of the participants in the Food and Agriculture LINK Programmes, sponsored initially by MAFF and now Defra, have been companies classified as SMEs. Moreover, because the industrial partners also include the sectoral levy bodies and trade associations, representing many small farming (and food) businesses, the relevance of and accessibility to results from these collaborative programmes for smaller companies is far higher. LINK projects have been very successful in helping industry solve practical problems and adjust to current and emerging pressures. The co-ordinators of each Programme are aware of expertise available from smaller companies and, where this will benefit proposals, can help them contact other potential participants. Therefore, the academic/industry consortia supported in LINK projects often involve both larger companies associated with the sector (plant breeders, agrochemical firms, supply trade, food processors and retailers) and a range of smaller ones providing specific skills or an innovative component. SMEs continue to be well represented in LINK and many become involved with further projects after a successful first one.

Attached at Annex B is the latest annual record of SME participation in LINK from LGC (who process LINK contracts for Defra). LGC indicate that 2008–09 was fairly typical; they normally find about one third of participants are SMEs.

*“Some of our witnesses have argued that the UK should take its best land and use it to produce food in the most efficient way, while using other land to provide environmental services. Does Defra agree with this view?”*

Sustainable Farming ought not be in conflict with the environment. The best farmers work to preserve and sustain their environmental resources, eg soils, water quality, biodiversity etc, because they choose the right crops and production techniques that help build soil fertility, use pest control strategies that minimise use of pesticides and know that if they damage these resources they will damage their capacity to continue farming successfully in the future. Defra’s focus is on sustainable farming—helping farmers produce the food we need today but maintaining and seeking to rebuild our environment and natural resources for the future.

It is not for Government to dictate how people should use their own land. Market demands and the specific farmland conditions (e.g. soil, rainfall, aspect etc) lead farmers to decide on what crops, livestock or other uses for the land are best suited to them. Much of our countryside is agricultural land, some 17.5 million hectares, that is 77% of the total land area of the UK. We need to conserve the environment and wildlife across all that land.

*“Does Defra keep records of the quality of farmland in the UK? If not, why not?”*

Soil quality is an important dimension of land, and information on soil monitoring is provided in answer to the Committee’s question on that below.

The Defra Observatory, set up to monitor the environmental impacts of CAP reform, tracks a variety of indicators, including regional crop yields, where trends would be influenced by farmland quality amongst other factors.

In addition, the Countryside Survey collects information on a wider range of aspects of environmental quality of the countryside (including farmland), involving a detailed field survey of habitats, vegetation, freshwater and soils across GB. A separate study of habitats is undertaken in Northern Ireland and where possible results are brought together to report for the UK. The findings are used in scientific research and to inform policy development for the management of the countryside. The first Countryside Survey was in 1978 and it has been developed and expanded every time it was repeated in 1984, 1990, 1998 and 2007. Data is collected using rigorous scientific methods so that the results from successive surveys can be compared with those from previous years. The results for UK have been published <http://www.countrysidesurvey.org.uk/>, and results for England can be downloaded from the on-line database. The results for England will be placed in a policy context in a report to be published shortly. The results show for example that soil pH of arable and horticultural land increased steadily since 1978 probably reflecting the general reduction in pollution from acid rain.

*“What part does Defra think organic farming should play in securing food supplies in the UK?”*

Experience from farming organically has much to offer to agriculture generally in terms of reducing reliance on inputs, in particular nitrate fertilisers, and making best use of on-farm resources. Reducing input costs has become an increasingly important factor in securing the viability of farm businesses.

The Government wants all UK agriculture—organic or otherwise—to produce as much as possible, as sustainably as possible, consistent with there being markets for what is produced. Ultimately, UK food security depends on the contribution of all our farmers, and those with whom we enjoy secure trading relationships—together—providing us with the rich diversity of safe and nutritious food we enjoy today.

Some advocates for organics, notably the Soil Association, argue that conversion to organic farming could provide adequate food supplies. However, they are clear that the balance between livestock products and other products in the national diet would have to be very different because most arable production would need to be used for food and the use of arable products for animal feed would have to be much curtailed.

Production of pig and poultry products which depends on the use of manufactured compound feeds would be much reduced and production of beef, sheep meat and dairy products would depend almost entirely on grass based systems which can be expected to impact on price and availability.

*What is Defra doing to encourage the efficient use of water within the UK food and farming industries?*

Defra is undertaking a number of projects related to on-farm water use efficiency. At present this is mainly an issue for irrigated crops in the horticulture, potatoes and field vegetables sector. We have also produced a water audit toolkit for farmers to use which is available online through the UK Irrigation Association.

The CAP health check requires Member States to address the issue of water management through cross compliance from 2010. The new standard will require compliance with England’s domestic abstraction licensing scheme, with which farmers must already comply. This forms part of the consultation package on proposed changes to cross compliance standards for Good Environmental Condition which will close on 27 May.

New rules will also be introduced in October 2009. At present, irrigation abstraction licences are only required for spray irrigation that abstracts over 20m<sup>3</sup> per day; other forms of irrigation do not require a licence. New rules, widening the scope of irrigation activities that will require a licence, are being consulted on presently with a view to introducing them in England in October 2009. The consultation can be found on Defra’s website at: <http://www.defra.gov.uk/corporate/consult/water-act/index.htm>. and the closing date is 22 July. The new rules on abstraction licensing will mean that any irrigation activity that abstracts over 20m<sup>3</sup> per day will require a licence (including trickle irrigation). The growing use of trickle irrigation and the use of land drainage systems to maintain field water levels and for warping (the abstraction of water which contains silt onto agricultural land so that the silt can deposit and act as a fertiliser) has prompted the proposed change.

#### EMBEDDED WATER

By importing food and other products, the UK is also importing “virtual” or “embedded” water—the water used to produce a product in a given country. As a heavy importer of virtual water, the UK has a substantial “external water footprint” (recent estimates by the WWF suggest this to be 62%, this figure includes non food products), and hence the potential to impact water resources outside of the UK. The impact of the UK’s external water footprint can be positive or negative—and will depend on the local conditions in the country of origin.

Defra are looking at embedded or virtual water in products and recently held a workshop with key stakeholders to examine the issue in more detail. A water footprint must be set in context and there is a need to understand the impacts of the water use in the particular locality of production—importing water embedded in products is not always a bad thing. Defra are currently commissioning research and evidence needs in this area—looking to plug evidence gaps.

#### FOOD INDUSTRY SUSTAINABILITY STRATEGY

The Food Industry Sustainability Strategy (FISS), published by Defra in April 2006, aims to improve the food industry’s environmental, social and economic performance by encouraging the widespread adoption of best practice by the industry. Amongst other things, it challenges the food industry “*to reduce its current levels of demand for water—at all stages of the supply chain—by improving efficiency through the adoption of best practice—without compromising food hygiene*”.

An industry-led FISS Champions Group on water use considered that industry should adopt water best practice consistently across England regardless of whether sites are located in areas of high water stress. It considers an overall water reduction target for the food industry of 20% by 2020 against a 2007 baseline to



be feasible, excluding water that forms part or all of the product, and proposed an initial action plan to help in achieving this. The report of the Champions Group on water use can be viewed at <http://www.defra.gov.uk/farm/policy/sustain/fiss/pdf/report-water-may2007.pdf>.

#### FOOD AND DRINK FEDERATION'S (FDF'S) FIVE-FOLD AMBITION

At the same time as the Government-initiated, but industry-led FISS has reduced the manufacturing sector's waste, energy use and transport costs, the ambition has also been taken up by the sector itself—for example, FDF's "Five Fold Ambition".

The FDF launched its Ambition in October 2007. One of the five pillars that FDF members recognised as areas where they could make the biggest difference was on the amount of water used in their factories.

In January 2008, the FDF, jointly with Envirowise, published a sector agreement. Called the Federation House Commitment, it sets out five steps to success for food and drink manufacturing companies wishing to work in a systematic way to improve efficiency. In summary these are:

1. Developing a 2007 baseline of water use.
2. Assessing water use at each manufacturing site.
3. Developing site specific action plans
4. Delivering against the action plan.
5. Providing annual progress reports to Envirowise.

An update report is expected in June 2009.

#### *What more can you tell us about the Government's plans to improve soil monitoring?*

Defra invests over £5 million per annum on soil and water research. Key to this research is the protection of soil resources in the long-term which will support both improved environmental and productivity aims. UK soil stores over 10 billion tonnes of carbon in the form of soil organic matter and we are assessing how this amount can be maintained and increased. We also need to understand the likely impacts of climate change on key soil threats and we will determine what action is needed once the impacts are understood.

Challenges over the medium and long term will be addressed in the soon to be published Soil Strategy. The Strategy aims to ensure that soils in the agriculture and land management sectors are adequately protected against degradation and to ensure farmers adapt soil management accordingly.

Defra funds research into soil and water management through a number of different research programmes including Sustainable Waste Management, Sustainable Farming Systems, Flood and Coastal Defence, Waste and Soil Protection. This work is underpinned by Biotechnology and Biological Sciences Research Council (BBSRC) and Natural Environment Research Council (NERC) research on soil.

Defra also continues to support collaborative soils research between industry and the research base through a number of LINK programmes.

Soil monitoring is required to understand the wider functions soil provides for society, ensure we are monitoring soil threats effectively, and that any discrepancies between data are resolved.

Defra is carrying out a programme of soil monitoring during the period 2007–09 as part of the Countryside Survey, and we are developing further plans for future soil monitoring to assess the ability of soils to perform the range of soil functions. Additionally, Defra-funded research is underway which should allow the selection of appropriate biological indicators for inclusion in future soil monitoring.

The initial soils analysis from the Countryside Survey of 2007 (published 2008); demonstrated a continuing trend in decreasing soil acidity and no overall change in soil carbon since 1978. A full analysis will be published towards the end of 2009.

In order to put in place a UK-wide soil monitoring scheme, the UK Soils Indicators Consortium (UKSIC), a cross-Government working group led by Defra, was formed in 2003. This was designed to develop a set of suitable indicators of soil function that would allow the current status and any change in soil quality to be monitored. The next stage of UKSIC was to develop a new UK Soil Monitoring Network based on these indicators.

Based on the outcome of research to design the UK Soil Monitoring Network, Defra will consider options utilising existing soil monitoring schemes (e.g. Countryside Survey and the National Soil Inventory), before adopting any new schemes. Defra will also liaise with the Environment Research Funder's Forum Environmental Observation Framework to ensure that any new monitoring activity is well co-ordinated with other monitoring activities.

*“What translational services does Defra fund (ie, services to ensure that the results of research are conveyed to and used by people in the farming and food sectors?)”*

Under LINK, Defra is continuing to fund projects in five programme areas: Food (Advanced Manufacturing Technologies and Quality); Horticulture, Renewable Materials, Sustainable Arable; and Sustainable Livestock Production. These programmes have been very successful in supporting projects that solve practical problems for these sectors. The projects funded have strengthened and improved innovation in the UK’s farming and food industries and help them adjust to current pressures. Across Government, the Technology Strategy Board (TSB) is now responsible for collaborative R&D in support of innovation. Discussions are in progress with them on setting up, with other funders and industry interests, a sustainable agri-food chain “Innovation Platform” to address future needs for innovation and translational research or technology transfer.

The TSB also funds Knowledge Transfer Networks (KTNs) and Knowledge Transfer Partnerships (KTPs) to bring together people from businesses, universities, research, finance and technology organisations to stimulate innovation through knowledge transfer or promote the flow of technology, skills and experience between business and the science base. A new “Biosciences KTN” has been formed which will serve the agri-food sector by including two networks in receipt of Defra funding (Genesis-Faraday for Animal Genetics; Food Processing KTN) alongside components of the existing Bioscience for Business KTN (including plant genetics).

Defra also funds these other translational services:

- **The Fertiliser Manual (RB209).** The primary aim of the recommendations contained in the manual is the maximisation of the economic return from the use of fertilisers. But adoption of the recommendations will also reduce the risk of applying more fertiliser nutrients than the crop needs and will therefore minimise the risk of causing nutrient pollution of the environment.

Software has also been developed which translates the information contained in the Manual into more specific and user-friendly information for farmers. The PLANET software recommends fertilisers based on farmer’s inputs about their fields, the crops being grown, soil analysis, and other factors, along with the data contained in the Manual’s tables.

The recommendations are built on evidence provided through field trials, specialist knowledge and expert opinion from the crop nutrition research community, with whom Defra has taken a partnership approach in developing this work.

- **The Code of Good Agricultural Practise (CoGAP).** In January 2009, Defra released the Code of Good Agricultural Practice (CoGAP). This is a practical guide to help farmers, growers and land managers protect the environment in which they operate. It offers practical interpretations of legislation and advice to help farmers avoid causing pollution and protect their resources.
- **The Rural Climate Change Forum (RCCF).** The RCCF is a high level stakeholder group which provides advice on policy, research and communications for climate change and land management. A Defra funded study undertaken through the Forum reviewed good practice in reducing greenhouse gas emissions from existing research to identify those which should be communicated to farmers, and identify knowledge gaps. The study aimed to ensure that farmers are provided with the information and advice they need to turn research results into practical action to reduce their greenhouse gas emissions. The study identified eight best practice mitigation measures to reduce agricultural emissions for which there is robust scientific evidence.

There was also an RCCF workshop on agriculture and climate change held in February 2009, the aim of which was to highlight key recent developments on climate change affecting the agriculture, forestry and land management sector and to consider the role of the sector in mitigating greenhouse gas emissions. The workshop will inform Defra’s thinking on next steps.

- **Farming Futures.** One of the main vehicles we have used to communicate messages on climate change to the agriculture sector is the Farming Futures Communications project which Defra has funded since 2007. *Farming Futures* provides advice to farmers on the impacts of climate change and what they can do to deal with this and reduce their greenhouse gas emissions. It has produced a series of fact sheets and case studies, some of which focus on reducing on-farm emissions. It is also holding a series of regional workshops for farmers.

*“What is Defra doing to address the potential skills gap in specific areas of agricultural research, such as soil science?”*

Defra commissioned an independent assessment of external capabilities the Department is likely to need to deliver evidence to meet its strategic requirements, including those for soils and land, and published a report of the findings on 12 May 2009. The report is not a statement of Defra policy or intent, but we expect it to influence future planning and strategic evidence management. We will review the findings of the report for soils and land, and, if appropriate, take forward the recommendations made.

Following the publication of the Royal Agricultural Society of England (RASE) report, Defra's Chief Scientific Advisor met with Sir Don Curry, Natural England (NE), the Environment Agency (EA), and representatives of the RASE to discuss soils and water research. It was agreed that Defra, EA and NE would co-fund a gap analysis of research needs, followed by a workshop to evaluate soils/water research priorities.

Defra continues to invest in research in soil and water management and currently spends over £5 million per year on soil and water research. The focus of this work is on sustainable agriculture, which means that the key considerations are protection of soil resources for the long term, as well as securing public goods such as preventing sedimentation of water, and assisting with flood mitigation. Much of this work is concerned with, or has indirect benefits for, agricultural production. An example of this is our work on protecting and enhancing levels of organic matter in soils.

*"What is Defra doing to encourage stakeholder participation in policymaking?"*

We believe it is imperative we maintain a strong relationship between food stakeholders and the Government key if we are to rise to the environmental, health and social challenges we face. While Government has a number of levers it can deploy, we rely on the food sector to deliver policies. Defra's relationship has developed from traditional sponsorship to one based more on engagement and partnership.

Defra engages extensively with the sector all along the food chain:

- Ministers and senior officials regularly meet with the Food and Drink Federation, the British Retail Consortium, and the big retailers and the food service and hospitality sectors.
- We work with public procurers to ensure the £2 billion annual public spend on food is deployed sustainably.
- At a more strategic level with the supply chain and other food sector stakeholders to review the longer term challenges on food—including how best to reconcile the range of economic, social and environmental tensions relating to food, for example on our project to develop a vision for secure and sustainable food.
- Defra also has an extensive engagement network at the primary production end of the supply chain.
- This engagement generates concrete action of mutual benefit along the supply chain. For example:-
- The Government brokered but industry led Dairy Supply Chain Forum helped identify areas where environmental objectives *and* cost savings can be delivered.
- The Government initiated, but industry led Food Industry Sustainability Strategy has reduced the manufacturing sector's waste, energy use and transport costs and been taken up by the sector themselves—for example the Food and Drink Federation's "Five Fold Ambition".
- We have worked with the Carbon Trust and industry to introduce a methodology for measuring carbon in food products to put downward pressure on carbon content and on production costs for the industry.
- We also meet regularly with the supply chain to review and challenge emerging regulatory burdens—through the Food Industry Better Regulation Group.
- The supply chain continues to engage in our Food Chain Emergency Liaison Group on emergency preparedness to ensure that the sector is as prepared for crises, and resilient when they occur in future, as it has proven to be in the past.

Officials are currently conducting a review of relationships Defra has with its food sector stakeholders and the channels through which we engage. We will revise our approach in the light of this review.

*"What is Defra doing to encourage long-term relationships in the food supply chain?"*

The approach and activities highlighted above are equally relevant to the short and longer-term horizons in terms of Defra's relationships with the food supply chain. It may be, however, that the Committee is asking about Defra's activity to encourage long-term relationships between food supply chain members themselves. In the latter case, we consider that it is for the supply chain to determine the optimal relationships that best add value. It is not for the Government to dictate what those relationships need to be unless there's a demonstrable market failure or a public good that can only be delivered by intervening in the market. So, for example, as outlined above, we work very closely with the supply chain and other Government Departments on emergency preparedness (through our Food Chain Liaison Emergency Group) to improve the state of readiness for emergencies and our response to them when they occur.

We also work very closely across supply chains to deliver environmental and social benefits in addition to economic resilience: for example in developing the milk road map with the dairy sector we helped the sector identify how environmental benefits could be delivered which also reduced input costs along the supply chain; and by establishing the pig meat supply chain forum to identify not just how value and resilience can be added along the chain, but also how social goods (animal welfare) and citizen interests (the provision of information about pigmeat products) can be delivered too.

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*“What is Defra’s role in ensuring that consumers receive consistent, coherent advice about what constitutes a healthy and environmentally sustainable diet?”*

Defra contributes to the Government’s healthy and sustainable food agenda through several initiatives. We are working with other Government departments on projects that will provide advice to consumers on a healthy and environmentally sustainable diet.

#### Healthier Food Mark

The Government is developing a food based standard to award to public sector organisations that offer healthier, more sustainable food and catering services. The Healthier Food Mark will include both nutritional and sustainability criteria. The Department of Health lead on this project and Defra are co-ordinating the development of the sustainability criteria. The Healthier Food Mark will be piloted during 2009 and Defra has volunteered to be involved in the pilot process.

#### Integrated Advice to Consumers project

*Food Matters* recommended that the Food Standards Agency expand on its current advice in order to provide a one-stop-shop to consumers looking for information and advice on nutrition, sustainability, food security and food safety. Defra sits on the steering group (along with DH, DfID, DCSF and School Foods Trust) and is actively involved in the project. The project is expected to be completed in early 2011.

#### Vision for a Sustainable Food System

Defra, FSA and DH were charged by *Food Matters* and Sustainable Development Commission’s *Green Healthy and Fair* to articulate a vision for a sustainable food system. The Vision will define what an economically, socially and environmentally sustainable food system will look like in 20 years’ time and then go on to describe how the UK can achieve it. To do this we are embarking on a series of discussions with stakeholders to explore the issues, identify the key sticking points, and develop a shared understanding of what we mean by a sustainable food system.

#### Influencing Consumer Food Behaviour

Research suggests that most consumers do not made the link between the food they eat and its impact on the environment. To tackle this Defra is developing the evidence base to shape consumer advice and information on what they can do to buy and eat food sustainably. We are working through existing initiatives to promote this behaviour change, for example through the Waste and Resource Action Programme’s (WRAP) Love Food Hate Waste campaign, which aims to reduce the amount of food wasted by consumers.

Information about some of the options for consumers to lower the impacts of their diet is available on the Greener Living pages on DirectGov. The food pages are a useful information tool to guide consumers through the maze of sustainable food choices. The information is maintained by Defra and others and is updated regularly as evidence and policy develop. It is a successful and well used web site with lots of tips and good advice on a number of food related environmental issues.

[http://www.direct.gov.uk/en/Environmentandgreenerliving/Greenershopping/DG\\_064434](http://www.direct.gov.uk/en/Environmentandgreenerliving/Greenershopping/DG_064434)

June 2009

## A LIST OF ONGOING AND RECENTLY COMPLETED LINK PROJECTS (Q565)

<i>LINK Code</i>	<i>Start Date</i>	<i>End Date</i>	<i>Project Title</i>
Food Link			
FT0604	01/04/1999	31/03/2000	mRNA Molecular Signatures of Foodborne Pathogens
FT0560	18/06/1999	17/06/2000	Steam surface pasteurisation of beef carcasses—A control point for E. coli O157:H7 (AFM103)
FT0606	01/10/1999	30/06/2000	Identification of “meat factor” to develop veg iron source
FT0607	01/11/1999	31/10/2000	MRI techniques for mapping of water and temperature distributions in foods
FT0611	18/09/2000	29/12/2000	Improved automated sandwich manufacturing (AFM153Br)
FT0605	01/01/2000	31/01/2001	Assured Food Manufacturing Through Process Performance Man
FT0609	01/02/2000	31/01/2001	Bacterial foodborne human pathogens in growing vegetable salad plants
FT0610	01/04/2000	31/03/2001	Relating the sensitivity of pack assembly processes to machine configuration and pack geometry
FT0562	18/10/1999	17/01/2002	Automated tracking and handling of meat cuts (AFM110)
FT0581	01/03/2001	28/02/2002	Sterilisation of Pre-Formed Cartons by UV Excimer Laser (AFM 138)
FT0553	01/10/1999	31/03/2002	AFM66 Reducing Infiltration in Refrigerated Store Rooms During Door Opening Using CFD
FT0612	30/04/2001	29/04/2002	Use of Ultrasound to Control and Monitor the Baking Process (FQS 21 Br)
FT0614	18/06/2001	17/06/2002	Surface Properties of Soluble Wheat Proteins and Their Influence on Baking Quality (FQS 18Br)
FT0585	01/07/2001	30/06/2002	Handling of Food Leaves for Successful Optical Inspection (AFM 167)
FT0511	01/09/2000	31/08/2002	Automated Ultrasonic Safety Inspection of Food Silos and Road Tankers (AFM 151)
FT0589	01/10/2001	30/09/2002	A feasibility study on low temperature absorption re Fridgeration systems for food engineering applications
FT0565	01/10/1999	31/10/2002	Reaction engineering understanding of barley and malt roasting (AFM 88)
FT1005	01/11/2000	31/10/2002	Reduction of risk associated with contamination of raw milk by Mycobacterium avium spp. paratuberculosis (FQS14)
FT0580	01/12/2000	30/11/2002	Improvements & Guidance On Best Designs & Operation Of Cleaning Systems (to minimise air borne contaminators) AFM 131
FT1001	01/09/1999	31/12/2002	High sugar polysaccharide systems (FQS 6)
FT0578	01/09/2000	31/12/2002	Self-cooling and heating of beverage and food containers (AFM 99)
FT0613	01/07/2001	31/12/2002	Novel Efficient Fresh Produce Distribution Centres (AFM 154 Br)
FT0566	04/01/2000	03/01/2003	Alternatives to methyl bromide for pest control in commodities (AFM 87)
FT0572	01/02/2001	31/01/2003	Electrostatic fogging for disinfection (AFM121)
FT0563	13/09/1999	28/02/2003	‘Multi-kinetic integrator for food process analysis, modelling and control (AFM113)’
FT0564	01/04/2000	28/02/2003	COLDROOM—Improving food temperature control in chilled and frozen storage rooms (AFM115)
FT0608	01/12/1999	31/03/2003	Application of buffering theory in agri-food and related sectors (was OC9621)
FT0583	01/01/2001	31/03/2003	Automated Food Placement for Sandwich and Pizza Production (AFM 145)
FT0615	01/11/2001	31/03/2003	Development of Industrial On-Line MRI Sensors of Food Quality (FQS 28 Br)
FT0576	01/01/2001	30/04/2003	Germicidal modified atmospheric packaging for food products (AFM 142)
FT0587	01/08/2001	31/05/2003	Automated Sandwich Assembly and Packing (AFM 173)

<i>LINK Code</i>	<i>Start Date</i>	<i>End Date</i>	<i>Project Title</i>
FT1002	01/08/2000	31/07/2003	ULTRAQUAL—Development of ultrasonic instrumentation for quality assurance
FT0574	01/07/2000	30/09/2003	Alternatives to methyl bromide for pest control in structures (AFM 93)
FT1003	01/07/2000	30/09/2003	Phage control of campylobacters in poultry production (FQS 2)—joint with FSA
FT1010	01/07/2001	31/10/2003	Internalisation of Human Pathogens into Growing Salad Vegetables and Leafy Herb Plants(FQS33)
FT0616	01/10/2002	31/12/2003	The application of vibration methods to the assessment of ripeness and damage in fruit and vegetables
FT1004	01/02/2001	31/01/2004	Rapid Analytical Methods for Raw Produce Quality & Safety Attributes (FQS12)
FT0618	01/09/2003	30/05/2004	Common Automation System Process and Ergonomics Research Study-CASPER (AFM212Br)
FT0582	01/09/2001	31/07/2004	Design and evaluation of barrier tunnels between low and high care food processing areas.(AFM132)
FT0903	01/06/2001	30/08/2004	Health Effects of Conjugated Linoleic Acid—Implications for Dairy Production (EFH 16)
FT1013	01/09/2002	31/08/2004	Improved Detection of Foodborne Viruses (FQS 38)
FT0619	01/11/2003	31/10/2004	Modular, Reconfigurable, Shelled Robotic Automation in Food Manufacture (AFM181Br)
FT1007	01/06/2001	30/11/2004	Stability of Foods and Food Ingredients in the Glassy State (FQS 05)
FT0586	01/07/2001	31/12/2004	Innovations in heat recovery systems for tubular heat exchangers(AFM 126)
FT0584	10/09/2001	31/12/2004	Pigging with Pumpable Ice (AFM 163)
FT0598	01/01/2003	31/12/2004	Use of Acidified Nitrite in Fresh Produce Decontamination (AFM 162)
FT0901	01/10/2000	31/01/2005	Meat factor peptides as a good iron source for vegetarians
FT0617	01/09/2003	28/02/2005	Expanding the Market Potential for Brewer Spent Grain (AFM 201Br)
FT0509	01/11/2001	31/03/2005	Semi-Rigid Food Containers: Aseptic Techniques for Sealing & Inspection (AFM 114)
FT1011	01/09/2001	15/04/2005	Multi-Vitamin Sensor (FQS19)
FT0595	01/04/2002	31/07/2005	Formal Based Methodologies for the Design of Stand Alone Chilled Food Display Cabinets AFM 144
FT1510	01/08/2004	31/07/2005	Further Development of Heat-based Methods for Disinfesting Flour Mills (AFM226)
FT0902	01/09/2001	31/08/2005	Evaluate the Health Potential of Fruit & Vegetable Snack Products (EFH 11)
FT1014	18/11/2002	17/11/2005	Modelling of Colour Formation in the Baking of Biscuits (FQS 29)
FT1525	01/01/2005	31/12/2005	AFM 237 Computational design of tubular heat exchangers
FT0596	01/09/2002	28/02/2006	Towards Improved Fermentation Consistency Using Multivariate Analysis of Process Parameters AFM 183
FT1023	01/08/2004	31/07/2006	Rapid Analytical Systems for Raw Produce Quality and Safety Attributes: Phase 2 Mycotoxins (FQS61)
FT1502	01/09/2003	31/08/2006	Next Generation Ejection Technology for the Bulk Food Sorting Industry (AFM 189)
FT0599	01/04/2003	30/09/2006	Snack Food Products with Optimised Flavour Delivery (AFM 187)
FT1017	01/09/2003	30/11/2006	Molecular Prediction of Spoilage by Yeasts and Moulds in Food and Drinks (FQS37)
FT1504	01/09/2004	30/11/2006	Tri-generation in the Food Industry (AFM 196)
FT1503	01/07/2003	31/12/2006	Validation of Safety & Quality in Flowing Fluids (AFM 194)
FT1520	01/01/2006	31/12/2006	Development of a Novel Belief Rule-based Methodology for Measuring and Assessing Food and Drink Quality—AFM 222
FT1009	01/08/2001	31/01/2007	Investigating Wheat Functionality Through Breeding and End Use (FQS 23)
FT1508	01/09/2004	28/02/2007	Advanced Filtration Technology through the use of ultrasonics (AFM 210)
FT1019	01/01/2004	30/04/2007	Improving Microbiological Safety & Quality of Ready to Eat Produce (FQS 47)
FT1529	13/03/2006	12/05/2007	Gas Plasma Decontamination of Fresh Foods—AFM 213
FT1507	01/12/2005	31/05/2007	A novel method of cleaning and decontaminating surfaces

<i>LINK Code</i>	<i>Start Date</i>	<i>End Date</i>	<i>Project Title</i>
FT1704	01/06/2006	31/05/2007	Salt Delivery for Maximum Flavour/Taste Perception in Foods—FQI05 Br
FT1021	01/01/2004	30/06/2007	In-line Sensor Measurement of Micronutrients in Flowing Food Systems (FQS48)
FT1024	01/06/2004	31/08/2007	New Technologies and Chemistries for Food Can Coatings—FQS 45
FT1540	09/10/2006	08/10/2007	Utilisation of waste heat from food factories (AFM 248 Br)
FT1028	01/11/2004	31/10/2007	Effect of bakery ingredients on the stability of bubbles in dough and the creation of texture in bakery products
FT1106	01/09/2004	30/11/2007	Methodology for the Evaluation of the Capability of Food Equipment to handle product variation (COFFEE)
FT1552	01/09/2007	30/11/2007	AFM260Br—Detection of the presence of insects or other pests in prepared salad products
FT1505	01/02/2004	31/01/2008	Biodegradable Starch Mano-Composites for Thermoformable Film Packaging for Food Products (AFM 200)
FT1519	01/11/2005	05/03/2008	Ultra high-pressure processing using propellants (UHP)—AFM 223
FT1523	01/10/2005	31/03/2008	(AFM 234) Factors affecting the attachment of bacteria to, and their detachment from, prepared fruit and vegetable tissues
FT1703	01/09/2006	31/03/2008	Designing palatable, nutritionally aligned foods using consumer reward strategies—FQI04 Br
FT1027	01/04/2005	30/04/2008	New Insights and Applications in the Prevention of Food contamination by Fungi (FQS 69)
FT1506	01/03/2004	16/05/2008	Development of an Economic yet Useful Powder Flowability Measuring Device (AFM206)
FT1514	01/12/2004	31/05/2008	NON-CONTACT ULTRASONIC QUALITY INSPECTION OF FOOD PRODUCTS (AFM227)
FT1539	01/04/2007	30/06/2008	Non-Invasive Infrared (IR) Sensors for Food Quality Assessment (AFM 247 Br)
FT1518	01/11/2004	31/07/2008	Automatic Reconfigurable Food Handling and Packaging System for Confectionery(AFM211)
FT1701	01/04/2006	30/09/2008	Reducing fat in processed foods using WOW emulsions—FQI 02
FT1565	01/04/2008	01/11/2008	AFM264—Non thermal pasteurisation by high intensity shockwave pulse for liquid commodity products
FT1022	01/09/2004	31/12/2008	The fate of Fusarium Mycotoxins in the cereal food chain (FQS64)
FT1526	01/06/2005	31/12/2008	AFM 236 Development of industrial on-line MRI sensors of food quality
FT1530	15/01/2006	14/01/2009	Colour and Translucency of Food Liquids—AFM229
FT1553	01/09/2007	28/02/2009	AFM257—Sterilisation Time Temperature Integrator
FT1521	01/10/2005	31/03/2009	Exploiting Brewing Co-products (AFM230)
FT1517	01/12/2005	31/03/2009	Development of environmentally friendly, energy efficient, rapid heating and cooling systems for the food industry (AFM 224)
FT1705	14/06/2007	16/06/2009	Norovirus stability in food manufacturing and the environment
FT1561	01/09/2008	30/06/2009	AFM268—Demonstration of spray freeze drying for the manufacture of food ingredients and products
FT1538	01/07/2006	31/12/2009	Exploitation of non-destructive scanning laser Vibrometry for assessment of firmness and damage in fruit and vegetables (AFM 235)
FT1562	19/01/2009	18/01/2010	AFM269—Recovering energy from low temperature waste heat streams in the food processing industry, using scroll engines
FT1545	01/04/2007	31/03/2010	AFM251—Integration of tri-generation and CO2 based refrigeration systems for energy conservation in the food industry
FT1560	01/08/2008	31/07/2010	AFM267— Improving process efficiency and minimising material usage in vertical form-fill-seal systems (BIOFFS)
FT1548	01/04/2009	30/10/2010	AFM253—Cap Leak Detection
FT1715	01/03/2009	28/02/2011	FQI 30 Development of physically modified hydrocolloids and starches for enhanced salt perception
FT1711	01/07/2008	29/06/2011	FQI 22—Impact of Anaerobic Fermentation on the Flavour Stability & Shelf Life of Beer (BR1)
FT1568	01/09/2008	31/08/2011	Enhanced sustainability of chilled prepared foods by using risk assessment to set shelf life, reduce processing energy and wastage whilst assuring safety

<i>LINK Code</i>	<i>Start Date</i>	<i>End Date</i>	<i>Project Title</i>
FT1541	01/04/2009	31/03/2012	AFM249—The Grail Robot
FT1566	01/04/2009	31/03/2012	Detection of the presence of insects or other pests in prepared salad products (AFM273)
<b>Horticulture LINK</b>			
HL0133LHN	01/09/1999	31/08/2002	Micropropagation & weaning of slow growing hardy ornamentals by application of novel forced ventilation techniques.
HL0148LFV	01/01/2000	31/12/2002	CAULICUT: Selective mechanical harvesting of cauliflowers.
HL0132LHN	01/04/1999	31/03/2003	Improving the control and efficiency of water use in container-grown hardy ornamental nursery stock.
HL0142LFV	01/04/1999	31/03/2003	Improving the quality and shelf life of cut salad products.
HL0160LFV	01/09/2000	31/08/2003	Integrated control of slugs in horticulture
HL0161LHB	01/07/2000	31/10/2003	Development of a method of biological control of European foulbrood in honeybees to supersede antibiotic treatments ...
HL0135LSF	01/10/1999	31/03/2004	Overcoming the loss of methyl bromide with a competitive & sustainable soil-less strawberry production system.
HL0149LFV	01/04/2000	31/03/2004	Parsnip Yellow Fleck Virus: Development of a disease management strategy
HL0150LOF	01/04/2000	31/03/2005	Varieties and integrated pest and disease management for organic apple production (LINK)
HL0172LHN	01/10/2004	31/03/2006	Producing High Quality Horticultural Growing Media through the Retention of Plant Structure in Composted Food-Processing Waste
HL0164LFV	01/08/2003	31/07/2006	Defining quality assurance for sweet onions with rapid Biosensor analysis
HL0163LMU	01/10/2003	30/09/2006	Improving the Efficiency and Environmental Impact of Mushroom Composting
HL0167LFV	01/09/2003	28/02/2007	Improved Crop Health and Establishment using Beneficial Micro-Organisms
HL0165LFV	01/04/2003	31/03/2007	Sustainable improvement of vegetable quality, water and nutrient use efficiency using dynamic fertigation
HL0169LSF	01/04/2004	31/03/2007	Molecular breeding for root rot resistant raspberries suitable for low input growing systems
HL0166LOF	01/07/2003	30/06/2007	Early detection of latent botrytis in cut flowers and pot plants for reduction of supply chain wastage
HL0173LFV	01/04/2005	30/06/2007	Mechanical weed control for integrated and organic salad and brassica production
HL0171LHN	01/04/2005	31/05/2008	Development of the Entomogenous Fungus, <i>Metarhizium anisopliae</i> , for Control of Vine Weevil Larvae and Thrips in Horticultural Growing Media
HL0181	01/04/2007	31/10/2008	Optimising and validating rapid biosensor analysis for cost effective quality assurance
HL0136LSF	01/08/1999	31/12/2008	Integrated use of soil disinfectant and microbial/organic amendments for the control of soil borne diseases
HL0186LFV	01/04/2007	31/12/2008	Controlling supply, quality and waste in brassica vegetable crops: understanding the causes of variation in maturity of purple sporouting broccoli (PSB)
HL0188	01/01/2008	31/12/2008	UV-induced hormesis: a novel approach to reduce waste and maintain quality in fresh produce
HL0176LFV	01/04/2006	31/03/2009	Integrated Allium white rot control using composts and <i>Trichoderma viride</i>
HL0183LFV	01/04/2007	30/06/2009	Minimising environmental impact of weed control in vegetables by weed detection and spot herbicide application
HL0168LHN	01/10/2005	30/09/2009	Enhancing the quality of hardy nursery stock and sustainability of the industry through novel water-saving techniques
HL0174LFV	01/10/2005	31/12/2009	Companion Planting for Pest Control in Field Crops
HL0179LHN	01/01/2007	31/12/2009	Producing a horticultural growing media peat replacement through the retention of plant structure in composted food-processing waste "COMPEAT"
HL0177LSF	01/04/2006	31/03/2010	Biofumigant crops as replacements for methyl bromide soil sterilisation in strawberry production
HL0184LSF	01/04/2007	01/04/2010	Pheromone technology for monitoring and control of Capsid pests to reduce pesticide use in horticultural crops



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HL0182LFV	01/04/2007	30/06/2010	Sustaining UK fresh onion supply by improving consumer acceptability, quality and availability
HL0178LBU	01/10/2006	30/09/2010	Integrated control of bulb-scale mite in Narcissus
HL0175LSF	01/04/2006	31/03/2011	Integrated Pest and Disease Management for high quality protected raspberry production
HL0193	01/06/2008	31/05/2011	New approaches to microbial control on insect pests in protected crops and their interaction with waste-growing media
HL0187LFV	01/04/2007	31/03/2012	Improving water use efficiency and fruit quality in field grown strawberry
HL0194	01/04/2008	31/03/2012	Exploiting semiochemicals, conservation biocontrol and selective physical methods in integrated management of pear sucker
HL0191	01/04/2008	31/03/2013	Minimising pesticide residues in strawberry through integrated pest, disease and environmental crop management
HL0192	01/12/2008	30/11/2013	Perennial field margins with combined ecological and agronomical benefits for vegetable rotation schemes
Livestock LINK			
LK0617	01/10/1999	28/02/2003	Nutritional effects on oocyte quality, prenatal survival and within-litter variability in pigs.
LK0622	01/09/1999	31/03/2003	Selecting for reduced aggression in pigs
LK0625	01/04/2000	31/03/2003	Identifying QTL segregating in commercial broiler populations
LK0626	01/10/1999	31/03/2003	Genetic control of pig meat quality
LK0641	01/04/2000	31/03/2003	Vitamin and mineral nutrition to optimise efficiency and quality in modern poultry genotypes
LK0644	01/06/2000	31/05/2003	Control of flavour in British Beef
LK0647	01/08/2001	31/07/2003	Improving the targeting of knowledge and technology transfer in the livestock sector by understanding farmer attitudes
LK0628	01/07/1999	30/09/2003	QTL identification and utilisation in sheep Sire Referencing Schemes
LK0629	01/10/1999	30/09/2003	Developing effective suckler cow replacement strategies
LK0642	01/09/2000	31/10/2003	Bacteriophage mediated control of Clostridium perfringens in poultry
LK0614	01/01/2000	31/12/2003	Integrated management system for pigs
LK0638	01/04/2002	31/12/2004	High-sugar ryegrass for sustainable production of ruminant livestock and reduced environmental N-pollution
LK0643	01/10/2000	31/01/2005	UK Poultry IPPC Compliance (UPIC)
LK0649	01/01/2002	31/01/2005	Using Generalised Innate Immunity to Enhance Pig Health and Welfare
LK0630	01/04/2001	31/03/2005	Roslin Bovine Genome Mapping
LK0650	01/08/2002	31/07/2005	Dairy farm dirty water—seeking the best solutions to avoid pollution
LK0658	01/12/2003	30/11/2005	Measurement of the nutrient value of whole crop wheat and barley silages for ruminants using NIRS
LK0639	01/01/2001	31/03/2006	Developing a fertility index (DFI)
LK0645	01/01/2001	31/03/2006	Endocrine management of bovine infertility (EMBI)
LK0653	01/01/2003	30/06/2006	The Effect of the Double Muscling Gene in Cattle on Production Efficiency and Meat Quality
LK0663	01/07/2005	30/06/2006	Humane electric stunning of farmed sea fish
LK0669	01/04/2006	31/12/2006	Vascular perfusion chilling (VPC) for red meat carcasses—feasibility assessment
LK0657	01/02/2004	31/01/2007	Identifying and characterising robust dairy cows
LK0656	01/06/2004	31/05/2007	Marker Assisted Selection Applied to Commercial Sheep
LK0652	01/09/2003	31/08/2007	Sustainable Systems for Weaner Management, Package 2, Nutritional management towards sustainable production
LK0660	01/04/2004	31/08/2007	Effects of nutrition and UV lighting on broiler bone and leg abnormalities (broiler bones)

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LK0661	01/01/2005	31/03/2008	The development of modern long-life storage diluent for fresh ram spermatozoa
LK0664	01/04/2005	31/03/2008	Development of nutritional regimens for rearing organic laying stock
LK0673	01/04/2007	30/09/2008	Development and evaluation of Video Image Analysis (VIA) systems to monitor growth and carcass quality in live beef animals
LK0665	01/01/2006	31/03/2009	Improving gut health and nutrient capture of broiler chickens through selection for innate immune function
LK0668	01/08/2005	31/03/2009	A molecular approach to breeding for resistance to footrot
LK0671	01/04/2006	31/03/2009	Improved venison quality for sustainable deer farming
LK0684	01/06/2008	30/09/2009	Avoiding the welfare/quality compromise: head only electrical stunning of poultry
LK0666	01/10/2005	31/10/2009	Vaccination strategies for control of enterohaemorrhagic Escherichia coli O157:H7 in cattle
LK0670	01/10/2006	30/09/2010	The effect of TM-QTL and other QTLs on lean meat yield and meat quality in sheep and its evaluation using VISA
LK0676	01/10/2007	30/09/2010	Improved design and management of woodchip pads for sustainable out-wintering of livestock
LK0674	01/04/2008	31/03/2011	Improving welfare, health & sustainability in dairy cows by expanding the selection objectives to include calving ease, udder health & longevity (Expanding Indices)
LK0689	01/01/2009	31/12/2011	Low protein diets for pig production
LK0682	01/07/2008	31/10/2012	The environmental consequences of using home-grown legumes as a protein source in pig diets
LK0685	01/04/2008	31/03/2013	Genetic improvement of forage grasses and white clover to improve phosphorus use efficiency and reduce phosphorus losses to water from UK grasslands
LK0686	01/04/2008	31/03/2013	Genetic improvement of perennial ryegrass and red clover to increase nitrogen use efficiency and reduce N losses from pastures and silo
LK0687	01/04/2008	31/03/2013	Genetic improvement of perennial ryegrass and white clover to increase the efficiency of nitrogen use in the rumen
LK0688	01/04/2008	31/03/2013	Development of productive and persistent high quality forage grasses and white clover with increased water-use-efficiency and resilience to summer droughts
Foresight LINK			
LK0702	01/04/2000	30/06/2003	‘GIS based Commercial High resolution Agro-Meteorological data, products and services on the internet’
Renewable materials LINK			
LK0805	01/04/1999	30/06/2000	FIBRECLEAN: The production of clean UK-grown fibre
LK0806	10/01/2000	31/10/2003	STRAWFRAC: The sequential extraction of value added products from wheat straw
LK0813	01/12/2002	30/11/2004	Resins from sustainable sources for composite materials
LK0812	01/12/2002	30/11/2005	Antioxidant-based industrial products from oats (ABIPO)
LK0809	01/01/2002	31/12/2005	TEXFLAX: Processing and cultivation of short-fibre flax for high value textile end uses
LK0814	01/10/2002	31/03/2006	Optimised production and extraction techniques for consistent yield and quality of skin-protecting phytochemicals
LK0818	01/10/2003	02/05/2007	Novel Processing of Cereal Straws for Fibre Packaging Materials
LK0807	01/12/2002	31/07/2007	Development of thermoplastic biocomposites (BIOMAT)
LK0819	01/03/2004	30/09/2007	Biodegradable foams based on wheat flour—from materials processing to modelling and design for packaging applications
LK0820	01/05/2004	31/10/2008	Sustainable Technology In Nettle Growing—STING

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LK0842	01/09/2007	01/04/2009	OMNIVORE: An Engine Concept to increase market penetration of bioalcohols via optimized flex-fuel operation
LK0821	01/06/2006	30/04/2009	Novel hair coloration methods using natural plant extracts and associated green extraction processes (KERACOL)
LK0826	01/11/2007	31/10/2009	Sustainability assessment to overcome barriers to renewable construction materials
LK0822	01/04/2006	31/03/2010	Developing an alternative UK industrial crop <i>Artemisia annua</i> , for the extraction of Artemisinin to treat multi-drug resistant malaria.
LK0823	01/02/2008	31/07/2010	UK cultivation of rosemary to provide the raw materials for development of a new genre of bio-based antioxidants
LK0845	01/10/2007	30/09/2010	Bio-derived polyurethanes from up-graded milk co-products
LK0830	01/08/2007	31/01/2011	Bio-Composites based on whole utilisation of wheat straw
LK0855	01/12/2008	28/02/2011	A Systems Platform for Substituting and Integrating Renewable Materials and Chemicals Manufacturing
LK0837	01/10/2008	30/09/2011	Micro-encapsulation of active ingredients using renewable material from hemp and maize pollens
LK0838	01/10/2008	30/09/2011	Conversion of high sugar grasses to alcohol based transport fuel (GRASSOHOL)
LK0850	01/11/2008	31/10/2011	Inorganic Polymer Bio-composites (IPBC)
LK0852	01/01/2009	31/12/2011	PROSPEC: Ecotoxicology Test Protocols for Representative Nanomaterials in Support of the OECD Sponsorship Programme
LK0854	01/10/2008	29/02/2012	Developing hemp-lime low-carbon construction for mainstream uptake through innovation and optimisation
LK0848	01/10/2008	30/09/2012	Production of bioalcohols from lignocellulosic waste materials produced in the agri-food chain
Arable LINK			
LK0911	01/04/1999	31/03/2001	Air induction nozzles: interaction of spray liquid with nozzle design and effects on drift, penetration & retention.
LK0909	01/06/1999	31/05/2002	Monitoring and control of <i>Ralstonia solanacearum</i> , the quarantine bacterium which causes brown rot disease.
LK0910	01/07/1999	30/09/2002	Improving potato seed health using molecular diagnostics to help sustain future competitiveness of the UK potato ind.
LK0906	01/04/1999	31/03/2003	Botanical and rotational implications of genetically modified herbicide tolerance
LK0907	01/04/1999	31/03/2003	Strategies for integrated control of take-all
LK0912	01/10/1999	31/03/2003	The prevention of pod shatter in oilseed rape
LK0917	01/10/2000	30/09/2003	Pest and disease management system for supporting winter oilseed rape decisions (PASSWORD)
LK0914	01/04/2000	31/03/2004	Use of mycopesticides as a means of reducing OP pesticide and methyl bromide usage in the control of stored food pests
LK0915	01/04/2000	31/03/2004	3D Farming—making biodiversity work for the farmer
LK0919	01/10/2001	30/09/2004	Control of potato storage diseases by laser treatment
LK0913	01/12/1999	30/11/2004	Breeding for improved resistance to <i>Septoria tritici</i>
LK0918	01/01/2001	31/12/2004	Integrated control for PCN
LK0924	01/10/2001	31/12/2004	Integrated control of wheat blossom midge
LK0928	01/10/2002	31/07/2005	Advance automation technologies for sustainable agricultural production
LK0920	01/09/2001	31/08/2005	Providing a scientific basis for the avoidance of fungicide resistance in plant pathogens
LK0923	01/09/2001	31/08/2005	Improving crop profitability by using minimum cultivation and exploiting grass weed ecology.
LK0925	01/09/2001	31/08/2005	Integrated control of slugs in arable crops
LK0916	01/10/2000	30/09/2005	A Weed Management Support System (WMSS) for weed control in winter wheat
LK0929	01/10/2002	30/09/2005	Improving the detection and monitoring of storage beetle pests by development of a multi-species lure

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LK0944	01/10/2003	30/09/2005	Validation of disease models in the PASSWORD integrated decision support system for pests and diseases of oilseed rape
LK0931	01/03/2003	28/02/2006	Enhanced prediction of susceptibility to mechanical damage in harvested and stored potatoes
LK0922	01/07/2001	31/03/2006	Spray behaviour at reduced application volumes
LK0927	01/04/2002	31/03/2006	Prediction of wheat protein
LK0930	01/04/2003	30/09/2006	Controlling soil-borne wheat mosaic virus in the UK by developing resistant wheat cultivars
LK0949	01/01/2004	31/12/2006	Opportunities to reduce environmental contamination by pesticides through modified and novel spray application methods matched to crop canopy characteristics
LK0932	01/04/2003	31/03/2007	Reduced fusarium ear blight and mycotoxins through improved resistance (REFAM)
LK0948	01/04/2004	31/03/2007	Novel pest control based on insect immune suppression and endocrine disruption
LK0951	01/02/2004	31/03/2007	Developing new management options for soil-borne pests of organic system
LK0955	01/04/2004	31/03/2007	Development of drip irrigation technology as a delivery system for the improved targeting and control of nematode pests in a range of root crops
LK0957	01/04/2004	31/03/2007	Understanding Sclerotinia infection in oilseed rape to improve risk assessment and disease escape
LK0926	01/01/2002	30/06/2007	Sustainable arable farming for an improved environment (SAFFIE)
LK09105	01/10/2007	31/03/2008	A novel strategy for reducing wastage in potato storage by improved control of tuber dormancy.
LK0953	01/04/2004	31/03/2008	Stewardship of neonicotinoid insecticides
LK0956	01/04/2004	31/03/2008	Components of resistance to diseases in winter oilseed rape cultivars
LK0961	01/07/2004	30/06/2008	Targeting winter barley disease management
LK0962	01/07/2004	30/06/2008	Towards a sustainable whole-farm approach to the control of ergot
LK0958	01/06/2004	31/08/2008	Identification of genetic markers for lodging resistance in wheat
LK0995	01/10/2007	31/08/2008	Disguising the leaf surface: a novel approach to disease and pest control using polymers from cereals
LK0987	01/09/2006	30/09/2008	Reducing the pesticide burden on UK crops through the use of targeted delivery systems
LK0966	01/01/2006	31/12/2008	Managing potato cyst nematode through maximising natural decline and population suppression
LK0969	01/04/2005	31/12/2008	Assessment of wheat blossom midge risk and exploitation of resistant and tolerant varieties
LK0970	01/10/2005	31/01/2009	Sustainable Production of Organic Wheat
LK0974	01/10/2005	30/03/2009	Biofortification of wheat with selenium to increase human dietary intake
LK0950	01/01/2004	31/03/2009	Lupins in Sustainable Agriculture—LISA
LK0954	01/04/2004	31/03/2009	The incorporation of important traits underlying sustainable development of the oat crop through combining conventional phenotypic selection with molecular marker technologies
LK0964	01/04/2005	31/03/2009	Novel resources for oilseed rape breeding. Improving harvest index. (ORB-LINK)
LK0965	01/04/2005	31/03/2009	Integrated Management of Herbicide Resistance
LK0989	01/04/2006	31/03/2009	Integration of precision irrigation and non-water based measures to suppress common scab of potato
LK0959	01/07/2004	30/06/2009	Genetic Reduction of Energy use and Emissions of Nitrogen in cereal production, GREEN grain
LK0967	01/04/2005	30/09/2009	Biopesticides for the control of storage insect pests
LK0975	01/10/2005	30/09/2009	An Integrated Approach to Stabilising HFN in Wheat: Screens, Genes & Understanding.
LK0976	01/10/2005	30/09/2009	Understanding evolution and selection of triazole resistance mechanisms in UK populations of <i>Mycosphaerella graminicola</i>
LK0980	01/04/2006	30/09/2009	Reduction in diffuse pollution of poultry operations through selection of wheat cultivars of high and consistent nutritional

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LK0971	01/08/2005	28/02/2010	quality. Managing uncropped land in order to enhance biodiversity benefits of the arable farmed landscape
LK0986	01/04/2007	30/03/2010	Improving water use efficiency and drought tolerance in UK winter wheats
LK0945	01/05/2004	31/03/2010	Improved Resistance to Septoria in Superior Varieties (IMPRESSIV)
LK0963	01/04/2005	31/03/2010	Improving P supply in organic farming systems
LK0973	01/04/2006	31/03/2010	Development and evaluation of low-phytate wheat germplasm to reduce diffuse phosphate pollution from pig and poultry production units
LK0982	01/04/2006	31/03/2010	Sustainable long term management of wireworms on potato
LK0993	01/09/2007	31/03/2010	Optimising pesticide use in arable agriculture by improving nozzle selection based on product efficiency to give optimised use and improved spray drift control
LK0960	01/10/2005	30/06/2010	Better Organic Bread: Integrating Raw Material and Process Requirements for Organic Bread Production
LK0990	01/04/2007	30/06/2010	Predicting grain protein to meet market requirements for breadmaking and minimise diffuse pollution from wheat production
LK0991	01/09/2007	31/08/2010	Environmentally-friendly technology for slug control based on orally-delivered fusion proteins containing specific molluscidal toxins
LK09111	01/10/2008	30/09/2010	Challenges from climate change for disease management in sustainable arable systems.
LK0984	01/11/2007	31/10/2010	Development of Alternatives to Animal Testing for Risk assessment to meet the requirements of new Chemicals Legislation
LK09102	01/08/2007	30/12/2010	Integrated control of the bean seed beetle, <i>Bruchus rufimanus</i>
LK0988	01/10/2007	31/12/2010	Reducing the risk of diffuse pollution by improved assessment of the nutrient content in farm manures and biosolids via Near Infrared Reflectance Spectroscopy (NIRS)
LK09110	01/04/2008	31/03/2011	Improvements in the efficacy and production of insecticidal fusion proteins for environmentally benign pest control
LK0979	01/07/2006	30/06/2011	Breeding oilseed rape with a low requirement for nitrogen fertiliser
LK0985	01/07/2006	01/07/2011	Defining and managing risks to safety and quality during food and feed grain storage
LK0996	01/10/2007	01/10/2011	<i>Buglossoides arvensis</i> : A new crop for the UK, containing stearidonic acid, a precursor of long chain Omega—3 fatty acid with nutraceutical properties.
LK09106	01/12/2008	30/11/2011	Using legume-based mixtures to enhance the nitrogen use efficiency and economic viability of cropping systems.
LK09114	01/01/2009	31/12/2011	Sustaining the effectiveness of new insecticides against aphid pests in the UK
LK09108	01/03/2008	29/02/2012	Development of an integrated pest management strategy for control of pollen beetles in winter oilseed rape
LK09117	01/01/2009	30/06/2012	Improving resource use efficiency in barley, through protecting sink capacity
LK0992	01/07/2007	30/09/2012	Adapting wheat to global warming
LK0999	01/04/2008	30/09/2012	Adaptive winter wheat populations: development, genetic characterisation and application
LK09109	01/12/2008	30/11/2012	Practical cost-effective techniques to reduce pollution from tramlines in combinable crops: a field and catchment scale evaluation

DEFRA LINK SME REPORT 1 APRIL 2008—31 MARCH 2009  
INFORMATION SUMMARY

<i>Programme</i>		<i>Grant Awarded</i>	<i>Total Participant</i>	<i>Academic Participant</i>	<i>Non-SME Industrial Participant</i>	<i>SME Industrial Participant</i>	<i>Total Cost</i>	<i>DEFRA Grant</i>	<i>Co-Sponsor Grant</i>	<i>Academic Cost</i>	<i>Non- SME Industry Cash</i>	<i>Non- SME Industry In Kind</i>	<i>SME Industry Cash</i>	<i>SME Industry In Kind</i>
Advanced and Hygienic Food Manufacture	AFM	3	15	6	7	2	787,085	436,773		436,773	0	325,312	0	25,000
Sustainable Arable Horticultural	SA HORT	6 3	88 55	16 7	32 25	40 23	6,121,484 2,789,347	3,021,441 1,363,312		3,565,678 1,850,592	446,739 407,280	919,943 523,693	97,500 80,000	1,635,863 415,062
Food Quality and Safety	FQS	1	19	3	9	7	1,097,786	405,004		682,003	227,000	257,834	50,000	157,949
Renewable Materials	RM	6	61	15	30	16	9,527,258	3,790,367	790,767	5,003,384	408,100	3,488,889	14,150	1,034,985
Sustainable Livestock Production	SLP	8	66	13	39	14	7,567,337	3,479,437	199,990	5,888,029	2,158,600	1,033,274	50,000	646,034
Food Quality and Innovation	FQI	1	3	1	1	1	272,070	136,000		136,000	0	101,400	0	34,670
Totals		28	307	61	143	103	28,162,367	12,632,334	990,757	17,562,459	3,647,719	6,650,345	291,650	3,949,563
Percentages			100%	20%	47%	34%	100%	45%	4%	62%	13%	24%	1%	14%

**Supplementary memorandum submitted by the Department for Environment, Food and Rural Affairs  
(SFS 57b)**

FURTHER INFORMATION FROM DEFRA TO THE EFRA COMMITTEE

*Could Defra send the Committee a list of all its workstreams relating to food security, with a few lines of explanation about the objective of each workstream and the target completion date? If there is any overlap/interaction with DfID on any of these projects, please could this be specified*

As the Government's lead department on food policy, many aspects of Defra's work are of relevance to the UK's continued food security, set in a global context. For the purposes of this response, however, the most relevant current workstreams of the department's Food Policy Unit, and other parts of Defra with which it is working closely, are itemised below:

- The UK Food Security Assessment due to be published in draft shortly will provide a picture of our food security across six theme areas. The Assessment will provide timely evidence on the key components of UK food security, and trend information to alert policy makers to potential changes requiring further examination. By its nature the Assessment will be on-going, and capable of adjustment to reflect emerging conditions. The first final set of indicators comprising the Assessment will be published in the autumn. It has required close work with a number of Government departments, including DFID.
- We have been developing a more detailed description of our long term goal for a sustainable and secure UK food system (to meet the recommendation in PMSU's *Food Matters* report), in partnership with the FSA and DH. A draft of this will be published shortly for wider discussion and consultation, and finalised with an Action Plan in the autumn. Actions will reflect the inclusive process of engagement with individuals and organisations to define the Vision that Defra has undertaken since *Food Matters* was published in July 2008.
- Indicators for a Sustainable UK Food System to provide timely information on the progress of key agreed components of the Vision. These indicators will sit alongside the UK Food Security Assessment to provide a complete picture of the key elements of the UK's Sustainable and Secure Food System. We aim to publish these in draft shortly and, following public consultation, produce a first final set of indicators in the autumn.
- We are running a project examining the impact of food price increases and the economic downturn on the ability of low income and vulnerable households in the UK to eat well. This will report in the autumn.
- Jim Fitzpatrick is co-chairing the Foresight Global Food and Farming Futures project with Mike Foster at DfID to examine how to feed nine billion healthily and sustainably by 2050. The report is due to finalise its recommendations in autumn 2010.
- We are continuing to work closely with DFID, building on the new International Development White Paper due shortly, to contribute to efforts to tackle hunger and food insecurity in a sustainable way (i.e. MDG 1 & MDG 7), including through the Global Partnership for Agriculture and Food Security (GPAFS) and engagement with FAO.
- We are also carrying out research into how we can increase global food production to meet global 2030 food needs in the most environmentally sustainable way. This is due to report by the autumn.

*Could Defra send the Committee any further information about the work it is carrying out to map the main risks to food security ( Q 546)*

It is possible to conceive of an array of environmental, technical, political and economic risks, threats and challenges to our food system. This was discussed with participants at stakeholder workshops in autumn 2008. Defra has also been building on the categorisation of risks contained in its 2006 publication, *Food security and the UK: An Evidence and Analysis Paper*,<sup>20</sup> and work by the OECD, and mapping them according to a number of themes in the draft Food Security Assessment being developed.

In this assessment we are taking a "balanced scorecard" approach to the risks and challenges to our food security. This reflects the complex and cross-cutting nature of our food supply. The indicators in the Assessment provide insights into the range of issues underlying our food security, how they fit together, and form an evidence-based framework for assessing the impact of different threats or "what if?" scenarios. They can be considered collectively in order to assess any material changes to our overall food security, as well as to highlight any potential trade-offs between them.

Other types of analysis occurring across Government will help us understand the short, medium and long term risks and challenges affecting our food security. The UK Food Security Assessment will sit alongside indicators for a sustainable UK food system, currently in draft, and due to be finalised later this year, to present a picture of how well all of us are achieving our goal of a secure and sustainable food system.

<sup>20</sup> <https://statistics.defra.gov.uk/esg/reports/foodsecurity/>

Additionally, the Foresight Project on Global Food and Farming Futures is taking a longer term perspective. It aims to produce practical recommendations about how to feed nine billion people sustainably and healthily by 2050, and will report next year. Other work has also used different approaches, for example, Chatham House has described and explored the implications of four different possible scenarios of the future<sup>21</sup>, while the Prime Minister's Strategy Unit has looked ahead into the future and identified a wide range of strategic challenges<sup>22</sup>. We can use such studies to inform the ongoing development of the food security assessment, and particularly our view of whether it explores resilience to the correct range of risks. Defra is also working to analyse the policy relationships between UK food security and other key policy objectives of the Government. We need a more sophisticated understanding of the connections between UK food security and other policy areas such as biodiversity, water availability, and climate change.

The UK Food Security Assessment will be informed in future by outcomes from these other approaches to analysing the risks and challenges affecting our food security, but will be a key evidence-based tool in helping us meet the needs of a resilient UK food system now and in the medium term. It will do this in three main ways: (i) by communicating a better understanding of the elements compromising UK food security, and promoting discussion on a wide-basis of appropriate priorities and policies; (ii) by assessing any material improvement or deterioration in the different dimensions of our food security by providing a benchmark assessment for indicators for the mid-1990s, and a forward looking five-to-ten-year projection; and, (iii) by signposting areas for more in-depth investigation or research.

*Does Defra have import/export statistics for different food commodities from 2000 onwards? If so, could it supply them?*

Yes, please see Annex A.

*Could Defra supply an outline of what the Cabinet Sub-Committee on Food has been working on since it was established?*

Cabinet Office guidance has confirmed that it is not possible to disclose information about the work of Cabinet sub-committees.

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<sup>21</sup> Food Futures: Rethinking UK Strategy, Chatham House (2009)

<sup>22</sup> Realising Britain's Potential: Future Strategic Challenges for Britain, Cabinet Office (2008); [http://www.cabinetoffice.gov.uk/media/cabinetoffice/strategy/assets/strategic\\_challenges.pdf](http://www.cabinetoffice.gov.uk/media/cabinetoffice/strategy/assets/strategic_challenges.pdf)



## DOMESTIC PRODUCTION, IMPORTS, EXPORTS AND SELF SUFFICIENCY (PRODUCTION AS % OF NEW SUPPLY)

AUK TABLE 5.1 TOTAL CEREALS; UNITED KINGDOM

		<i>Calendar years</i>										
		<i>1988</i>	<i>1989</i>	<i>1990</i>	<i>1991</i>	<i>1992</i>	<i>1993</i>	<i>1994</i>	<i>1995</i>	<i>1996</i>	<i>1997</i>	<i>1998</i>
<i>Thousand tonnes (unless otherwise specified)</i>												
<b>Supply and use</b>												
Production		21,110	22,725	22,582	22,635	22,060	19,500	19,960	21,870	24,590	23,534	22,767
Imports from:	the EU	2,639	2,089	2,208	1,876	2,659	2,808	2,442	2,130	1,654	2,005	2,018
	the rest of the world	702	503	589	602	563	396	488	537	563	795	739
Exports to:	the EU	1,828	1,779	2,803	4,369	3,916	2,647	3,099	4,023	4,394	3,751	4,479
	the rest of the world	2,922	4,783	3,884	1,692	1,954	2,062	1,782	1,128	1,341	1,728	1,330
Total new supply		19,701	18,755	18,692	19,052	19,412	17,995	18,009	19,386	21,072	20,855	19,715
Change in farm and other stocks		-632	-1,112	-818	43	584	-172	-1,323	-209	1,045	586	-708
Total domestic uses		20,333	19,867	19,510	19,009	18,828	18,167	19,332	19,595	20,028	20,269	20,423
Production as % of total new supply for use in UK		107%	121%	121%	119%	114%	108%	111%	113%	117%	113%	115%

		<i>Calendar years</i>									
		<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i>	<i>2008</i> <i>(provisional)</i>
<i>Thousand tonnes (unless otherwise specified)</i>											
<b>Supply and use</b>											
Production		22,125	23,988	18,959	22,965	21,494	22,005	21,003	20,816	19,130	24,278
Imports from:	the EU	1,677	1,890	2,158	2,239	1,953	1,934	2,129	1,838	1,641	1,536
	the rest of the world	926	914	828	772	645	463	702	653	809	748
Exports to:	the EU	3,130	3,836	1,862	2,479	4,240	2,934	3,097	2,680	2,362	3,002
	the rest of the world	1,270	1,793	571	254	827	80	208	65	78	465
Total new supply		20,328	21,163	19,512	23,243	19,026	21,388	20,529	20,562	19,140	23,095
Change in farm and other stocks		-72	453	-1,793	2,072	-2,068	469	-358	-50	-956	3,337
Total domestic uses		20,401	20,711	21,305	21,171	21,094	20,919	20,887	20,612	20,095	19,759
Production as % of total new supply for use in UK		109%	113%	97%	99%	113%	103%	102%	101%	100%	105%

Source: Defra Statistics

AUK TABLE 5.9 FRESH VEGETABLES; UNITED KINGDOM

<i>Thousand tonnes (unless otherwise specified)</i>											<i>Calendar years</i>	
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
<b>Supply and use</b>												
Total Production	3,249	3,192	3,040	3,116	3,239	3,137	3,145	2,827	3,072	2,937	2,863	
Supplies from the Channel Islands	36	32	28	23	26	20	22	18	18	19	16	
Imports from:												
the EU	685	740	747	755	721	930	1,251	1,451	1,440	1,315	1,098	
the rest of the World	241	238	244	237	242	156	180	246	218	198	146	
Exports to:												
the EU	34	44	35	53	53	197	286	287	204	215	73	
the rest of the world	6	7	3	4	5	22	33	40	34	65	4	
Total new supply	4,171	4,151	4,021	4,074	4,170	4,023	4,279	4,216	4,509	4,188	4,046	
Production as % of total new supply for use in UK	78%	77%	76%	76%	78%	78%	73%	67%	68%	70%	71%	

<i>Thousand tonnes (unless otherwise specified)</i>											<i>Calendar years</i>	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008		
											<i>(provisional)</i>	
<b>Supply and use</b>												
Total Production	2,952	2,923	2,865	2,573	2,543	2,559	2,710	2,597	2,480	2,607		
Supplies from the Channel Islands	16	15	14	12	12	11	8	8	8	8		
Imports from:												
the EU	1,091	1,095	1,306	1,365	1,415	1,498	1,736	1,683	1,685	1,696		
the rest of the world	156	154	180	201	197	203	204	210	263	261		
Exports to:												
the EU	89	97	97	105	97	74	57	71	69	59		
the rest of the world	2	2	5	7	6	18	31	12	19	15		
Total new supply	4,124	4,088	4,263	4,039	4,064	4,177	4,570	4,415	4,347	4,498		
Production as % of total new supply for use in UK	72%	71%	67%	64%	63%	61%	59%	59%	57%	58%		

Source: Defra Statistics

AUK TABLE 5.11 POTATOES; UNITED KINGDOM

	<i>Thousand tonnes (unless otherwise specified)</i>										
	<i>Calendar years</i>										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>Supply and use</b>											
Total Production	6,939	6,325	6,547	6,367	7,814	7,072	6,542	6,404	7,228	7,128	6,442
Supplies from the Channel Islands	35	31	41	42	53	48	42	38	51	58	38
Imports	948	1,030	907	936	957	990	1,120	1,201	1,040	1,017	1,194
Exports	117	216	214	269	271	218	332	340	280	363	375
Total new supply	7,745	7,169	7,281	7,077	8,554	7,893	7,373	7,304	8,038	7,840	7,279
Change in stocks	124	-397	104	8	678	-395	-462	248	377	-98	-347
Total domestic uses	7,621	7,566	7,177	7,068	7,876	8,288	7,835	7,055	7,661	7,938	7,626
Production as % of total new supply for use in UK	90%	88%	90%	90%	91%	90%	89%	88%	90%	91%	88%

	<i>Thousand tonnes (unless otherwise specified)</i>									
	<i>Calendar years</i>									
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
	<i>(provisional)</i>									
<b>Supply and use</b>										
Total Production	7,131	6,178	6,674	6,921	6,058	6,246	5,979	5,727	5,564	5,999
Supplies from the Channel Islands	44	43	36	39	31	31	38	31	33	26
Imports	1,105	1,272	1,900	1,791	1,707	1,774	1,387	1,404	1,544	1,606
Exports	339	373	343	463	440	381	397	628	380	431
Total new supply	7,941	7,120	8,268	8,288	7,355	7,671	7,006	6,533	6,762	7,199
Change in stocks	356	-686	468	-122	-486	68	-89	-409	-266	242
Total domestic uses	7,585	7,806	7,800	8,411	7,841	7,603	7,065	6,943	7,028	6,957
Production as % of total new supply for use in UK	90%	87%	81%	83%	82%	81%	85%	88%	82%	83%

AUK TABLE 5.12 FRESH FRUIT; UNITED KINGDOM

<i>Thousand tonnes (unless otherwise specified)</i>											<i>Calendar years</i>	
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
<b>Supply and use</b>												
Total Production	445	589	484	508	518	464	428	398	364	292	278	
Supplies from the Channel Islands	..	..	..	..	..	..	..	..	..	..	..	
Imports from:												
the EU	1,037	1,141	1,071	1,051	1,094	1,017	1,136	1,228	1,216	1,295	1,411	
the rest of the World	1,049	994	1,110	1,143	1,216	1,184	1,226	1,268	1,340	1,311	1,387	
Exports to:												
the EU	48	59	55	81	82	47	53	90	78	69	63	
the rest of the world	2	1	2	3	6	1	3	1	2	3	7	
Total new supply	2,481	2,664	2,608	2,618	2,740	2,615	2,734	2,805	2,842	2,828	3,007	
Change in stocks	-7	20	-28	1	23	-4	-7	-25	13	-56	44	
Total domestic uses	2,488	2,644	2,636	2,617	2,717	2,619	2,741	2,830	2,829	2,884	2,963	
Production as % of total new supply for use in UK	18%	22%	19%	19%	19%	18%	16%	14%	13%	10%	9%	

<i>Thousand tonnes (unless otherwise specified)</i>											<i>Calendar years</i>	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008		
									<i>(provisional)</i>			
<b>Supply and use</b>												
Total Production	347	307	331	294	269	294	363	392	403	403		
Supplies from the Channel Islands	..	..	..	..	..	..	..	..	..	..		
Imports from:												
the EU	1,193	1,273	1,310	1,362	1,244	1,258	1,312	1,361	1,264	1,145		
the rest of the World	1,495	1,480	1,569	1,640	1,751	1,935	1,992	2,128	2,268	2,180		
Exports to:												
the EU	74	59	73	69	78	105	119	177	146	117		
the rest of the world	1	-	1	1	1	1	1	1	2	1		
Total new supply	2,961	3,001	3,137	3,226	3,186	3,380	3,546	3,704	3,787	3,610		
Change in stocks	-20	6	2	-19	-1	20	9	-31	9	-5		
Total domestic uses	2,981	2,995	3,135	3,246	3,187	3,360	3,537	3,735	3778	3,615		
Production as % of total new supply for use in UK	12%	19%	11%	9%	8%	9%	10%	11%	11%	11%		

Source: Defra Statistics

AUK TABLE 5.13 CATTLE AND CALVES; BEEF AND VEAL; UNITED KINGDOM

<i>Thousand tonnes (unless otherwise stated)</i>											<i>Calendar years</i>	
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
<b>Supply and use (thousand tonnes, dressed carcase weight)</b>												
Home-fed production	953	985	1,002	1,028	973	888	947	1,002	710	698	695	
Imports from:												
the EU	238	191	160	165	160	157	149	145	95	141	93	
the rest of the world	53	47	37	39	45	52	41	67	74	75	60	
Exports to:												
the EU	129	143	122	126	140	167	228	263	64	13	9	
the rest of the world	35	35	22	31	25	45	65	72	16	1	—	
Total new supply	1,080	1,045	1,056	1,075	1,014	885	844	880	799	902	838	
Home-fed production as % of total supply for use in the UK	88%	94%	95%	96%	96%	100%	112%	114%	89%	77%	83%	

<i>Thousand tonnes (unless otherwise specified)</i>										<i>Calendar years</i>	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	
									<i>(provisional)</i>		
<b>Supply and use (thousand tonnes, dressed carcase weight) (I)</b>											
Home-fed production	679	704	645	694	703	724	765	852	888	863	
Imports from:											
the EU	125	133	189	211	223	238	205	198	204	214	
the rest of the world	59	64	74	88	85	85	82	72	75	78	
Exports to:											
the EU	10	9	8	10	10	12	14	52	76	93	
the rest of the world	—	—	—	—	—	—	—	—	1	1	
Total new supply	852	892	900	983	1,000	1,034	1,037	1,069	1,090	1,061	
Home-fed production as % of total supply for use in the UK	80%	79%	72%	71%	70%	70%	74%	80%	81%	81%	

Source: Defra Statistics

AUK TABLE 5.14 PIGS AND PIGMEAT; UNITED KINGDOM

<i>Thousand tonnes (unless otherwise stated)</i>											<i>Calendar years</i>	
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
<b>Supply and use of pigmeat (carcase weight equivalent)</b>												
Home-fed production	1,037	962	970	1,008	1,002	1,023	1,061	1,010	997	1,090	1,128	
Imports from:	371	409	396	383	377	404	388	448	529	480	476	
the EU	—	—	—	1	1	—	—	—	1	2	3	
the rest of the world	—	—	—	1	1	—	—	—	1	2	3	
Exports to:	82	85	84	112	138	205	147	172	175	227	277	
the EU	—	—	—	2	2	5	14	22	26	30	24	
the rest of the world	—	—	—	2	2	5	14	22	26	30	24	
Total new supply	1,326	1,286	1,282	1,278	1,240	1,217	1,289	1,263	1,326	1,314	1,307	
Home-fed production as % of total supply for use in the UK	78%	75%	76%	79%	81%	840%	82%	80%	75%	83%	86%	

<i>Thousand tonnes (unless otherwise specified)</i>											<i>Calendar years</i>	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008		
									<i>(provisional)</i>			
<b>Supply and use (thousand tonnes, dressed carcase weight) (I)</b>												
Home-fed production	1,042	907	777	774	688	679	669	667	707	703		
Imports from:	515	599	600	677	800	804	836	837	864	808		
the EU	3	5	2	2	6	6	6	7	5	5		
the rest of the world	—	—	—	—	—	—	—	—	—	—		
Exports to:	213	188	44	103	81	98	101	110	113	122		
the EU	28	30	4	5	11	12	12	10	12	17		
the rest of the world	—	—	—	—	—	—	—	—	—	—		
Total new supply	1,319	1,293	1,331	1,346	1,403	1,379	1,398	1,391	1,451	1,377		
Home-fed production as % of total supply for use in the UK	79%	70%	58%	58%	49%	49%	48%	48%	49%	51%		

Source: Defra Statistics

AUK TABLE 5.15 SHEEP AND LAMBS; MUTTON AND LAMB; UNITED KINGDOM

<i>Thousand tonnes (unless otherwise specified)</i>											<i>Calendar years</i>	
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
<b>Supply and use (dressed carcase weight)</b>												
Home-fed production	345	389	397	421	401	402	395	393	373	342	373	
Imports from:	1	3	3	3	8	7	13	15	23	22	17	
the EU												
the rest of the world	135	136	150	122	119	122	106	132	133	129	124	
Exports to:	94	106	101	114	150	182	157	181	151	130	134	
the EU												
the rest of the world	2	2	2	2	2	2	3	2	2	2	1	
Total new supply	385	418	447	430	376	347	354	356	376	361	378	
Home-fed production as % of total new supply for use in the UK	90%	93%	89%	107%	116%	111%	110%	99%	95%	98%		

<i>Thousand tonnes (unless otherwise specified)</i>											<i>Calendar years</i>	
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008		
									<i>(provisional)</i>			
<b>Supply and use (thousand tonnes, dressed carcase weight) (I)</b>												
Home-fed production	392	383	267	307	310	319	336	332	328	333		
Imports from:	17	17	15	14	19	22	20	21	21	21		
the EU												
the rest of the world	121	117	98	109	117	120	113	119	116	117		
Exports to:	141	124	38	69	84	85	93	94	76	93		
the EU												
the rest of the world	1	1	—	1	1	1	1	1	1	1		
Total new supply	387	392	342	360	362	375	375	377	389	376		
Home-fed production as % of total supply for use in the UK	101%	98%	78%	85%	86%	85%	90%	88%	84%	88%		

Source: Defra Statistics

AUK TABLE 5.16 POULTRY AND POULTRYMEAT; UNITED KINGDOM

		<i>Thousand tonnes (unless otherwise specified)</i>										<i>Calendar years</i>	
		1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
<b>Supply and use (carcase weight)</b>													
Production		1,140	1,107	1,140	1,202	1,217	1,277	1,370	1,427	1,481	1,527	1,548	
Imports from:	the EU	84	89	142	146	183	169	213	249	263	256	293	
	the rest of the world	..	..	..	..	1	1	—	2	18	20	22	
Exports to:	the EU	49	54	49	63	69	64	79	108	107	134	131	
	the rest of the world	15	16	15	21	16	21	32	55	66	79	67	
Total new supply		1,160	1,126	1,217	1,264	1,315	1,361	1,472	1,514	1,589	1,591	1,666	
Production as % of total new supply for use in UK		98%	98%	94%	95%	93%	94%	93%	94%	93%	96%	93%	

		<i>Thousand tonnes (unless otherwise specified)</i>									<i>Calendar years</i>	
		1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	
<b>Supply and use (carcase weight)</b>												
Production		1,549	1,514	1,566	1,557	1,578	1,571	1,583	1,517	1,459	1,429	
Imports from:	the EU	318	321	304	332	362	410	400	411	430	373	
	the rest of the world	31	34	42	34	50	67	85	40	31	35	
Exports to:	the EU	111	118	144	159	172	196	206	163	268	254	
	the rest of the world	76	56	42	54	88	72	55	70	25	22	
Total new supply		1,712	1,696	1,725	1,709	1,731	1,780	1,806	1,735	1,627	1,560	
Production as % of total new supply for use in UK		91%	89%	91%	91%	91%	88%	88%	87%	90%	92%	

Source: Defra Statistics



AUK TABLE 5.17 MILK; UNITED KINGDOM

	<i>Million litres (unless otherwise specified)</i>										
	<i>Calendar years</i>										
	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>Supply and use</b>											
Production	14,756	14,542	14,825	14,352	14,256	14,317	14,549	14,259	14,256	14,426	14,220
Imports	..	..	..	..	..	..	..	181	111	1218	129
Exports	47	58	75	70	68	89	129	185	173	290	373
Total new supply	14,709	14,485	14,751	14,282	14,189	14,228	14,420	14,255	14,194	14,264	13,975
Production as % of total new supply for use in the UK	100%	100%	101%	100%	100%	101%	101%	100%	100%	101%	102%

	<i>Million litres (unless otherwise specified)</i>									
	<i>Calendar years</i>									
	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 <i>(provisional)</i>
<b>Supply and use</b>										
Production	14,587	14,078	14,291	14,447	14,583	14,134	14,059	13,914	13,632	13,332
Imports	111	97	64	72	105	65	49	43	57	26
Exports	465	445	414	419	399	434	624	610	538	504
Total new supply	14,234	13,730	13,940	14,100	14,290	13,765	13,485	13,346	13,151	12,853
Production as % of total new supply for use in the UK	102%	103%	103%	102%	102%	103%	104%	104%	104%	104%

Source: Defra Statistics

**AUK Table 5.18**

**MILK PRODUCTS; UNITED KINGDOM**

These tables show production and supplies of milk products manufactured by both dairy companies and on farm. The figures are quoted in thousand tonnes and are not directly comparable with the figures shown in table 5.17, which are quoted in million litres.

Thousand tonnes (unless otherwise specified)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
<b>Butter</b>											
Production	147	140	151	132	127	141	148	133	130	139	137
Imports	127	117	113	104	128	110	120	114	111	105	
Export	119	65	38	39	51	52	53	52	74	66	
Intervention stock change	..	..	..	..	..	..	-4	-4	3	-2	-1
Total new supply	155	191	226	197	205	199	220	198	189	178	177
Production as % of total new supply for use in the UK	95	73	67	67	62	71	68	67	69	78	77
<b>Cheese</b>											
Production	303	288	320	309	332	338	342	363	379	379	367
Imports	198	179	202	192	232	189	212	210	239	239	257
Exports	28	36	40	51	48	57	59	55	59	53	55
Total new supply	473	431	482	450	516	470	495	518	558	565	569
Production as % of total new supply	64	67	66	69	64	72	69	70	69	67	65

Thousand tonnes (unless otherwise specified)

Calendar years

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008 (prov)
<b>Butter</b>										
Production	141	132	126	136	131	122	130	117	120	113
Imports	113	118	115	115	118	114	129	147	103	80
Export	56	45	41	39	44	35	45	36	32	22
Intervention stock change	6	3	1	4	-2	-8	-6	2	-3	-
Total new supply	192	201	200	209	207	208	219	226	195	171
Production as % of total new supply for use in the UK	74	65	63	65	63	58	59	52	62	66
<b>Cheese</b>										
Production	370	341	395	371	351	359	391	400	378	378
Imports	277	255	274	285	316	335	353	378	403	409
Exports	61	58	68	82	90	93	96	104	97	89
Total new supply	586	538	601	574	577	600	648	674	684	697
Production as % of total new supply for use in the UK	63	63	66	65	61	60	60	59	55	54

SELF SUFFICIENCY IN A SELECTION OF FRUIT AND VEGETABLES; SEASONALITY IN UK FRUIT PRODUCTION AND CONSUMPTION

**Table 1**

FRUIT: SUPPLIES OF APPLES, PEARS, PLUMS AND STRAWBERRIES FOR THE CALENDAR YEAR IN THE UK

	<i>Calendar Year</i>	1989	1990	1991	1982	1993	1994	1995	1996	1997	1998
		('000 Tonnes)									
<b>Apples:</b>											
Home Production Marketed (HPM)		400.1	304.7	305.5	326.5	325.8	306.1	273.3	223.9	187.1	183.7
Imports (d)		469.7	466.5	464.3	458.3	417.1	438.0	452.9	452.3	448.8	465.1
Exports (d)		30.6	19.8	40.9	36.4	11.7	13.6	36.4	29.8	20.4	20.7
<b>Total Supply:</b>		<b>839.2</b>	<b>751.4</b>	<b>728.9</b>	<b>748.4</b>	<b>731.2</b>	<b>730.4</b>	<b>689.8</b>	<b>646.4</b>	<b>615.5</b>	<b>628.2</b>
HPM as % of Total Supply		47.7	40.5	41.9	43.6	44.6	41.9	39.6	34.6	30.4	29.2
<b>Pears:</b>											
Home Production Marketed (HPM)		36.9	34.1	36.0	30.8	30.7	32.5	29.7	35.8	33.0	26.3
Imports (d)		96.5	97.9	89.5	107.9	99.4	101.3	103.1	102.8	103.6	130.9
Exports (d)		1.2	2.3	2.5	2.4	2.1	1.5	3.1	3.7	5.8	3.0
<b>Total Supply:</b>		<b>132.2</b>	<b>129.7</b>	<b>123.0</b>	<b>136.2</b>	<b>128.0</b>	<b>132.3</b>	<b>129.6</b>	<b>134.8</b>	<b>130.7</b>	<b>154.3</b>
HPM as % of Total Supply		27.9	26.3	22.6	24.0	24.6	22.9	26.6	25.2	17.1	
<b>Plums:</b>											
Home Production Marketed (HPM)		10.7	7.2	21.5	21.1	11.8	11.0	14.4	19.6	12.1	6.4
Imports (d)		28.9	27.4	26.2	33.6	29.0	32.2	30.5	31.1	36.2	39.6
Exports (d)		0.1	0.2	1.3	0.5	0.7	0.5	0.5	1.5	1.4	0.5
<b>Total Supply:</b>		<b>39.5</b>	<b>34.4</b>	<b>46.4</b>	<b>54.2</b>	<b>40.1</b>	<b>42.7</b>	<b>44.4</b>	<b>49.2</b>	<b>46.8</b>	<b>45.5</b>
HPM as % of Total Supply		27.1	20.9	46.3	38.9	29.4	25.9	32.3	39.8	25.9	14.1
<b>Strawberries:</b>											
Home Production Marketed (HPM)		44.2	50.5	44.2	40.8	48.3	38.1	41.9	39.9	33.0	35.0
Imports (d)		27.9	28.6	32.4	34.0	33.3	42.0	39.6	39.5	48.3	53.7
Exports (d)		0.1	0.2	0.3	0.4	..	0.1	0.2	0.3	0.4	0.2
<b>Total Supply:</b>		<b>72.0</b>	<b>78.9</b>	<b>76.3</b>	<b>74.4</b>	<b>81.7</b>	<b>80.0</b>	<b>81.2</b>	<b>79.2</b>	<b>80.9</b>	<b>88.5</b>
HPM as % of Total Supply		61.4	64.0	57.9	54.9	59.2	47.6	51.5	50.4	40.7	39.5

	('000 Tonnes)									
<i>Calendar Year</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>2006</i>	<i>2007</i> <i>(Provisional)</i>	
<b>Apples:</b>										
Home Production Marketed (HPM)	246.4	208.7	211.8	179.4	143.9	170.3	218.2	240.8	242.8	
Imports (h)	467.7	473.7	467.8	448.5	476.4	523.8	520.4	537.9	522.1	
Exports (H)	19.5	18.3	16.9	14.9	18.9	17.7	13.4	23.1	29.6	
<b>Total Supply:</b>	<b>694.6</b>	<b>664.2</b>	<b>662.7</b>	<b>612.9</b>	<b>601.4</b>	<b>676.4</b>	<b>725.2</b>	<b>755.6</b>	<b>735.3</b>	
HPM as % of Total Supply	35.5	31.4	32.0	29.3	23.9	25.2	30.1	31.9	33.0	
<b>Pears:</b>										
Home Production Marketed (HPM)	22.7	26.6	38.5	34.2	29.6	22.7	23.4	28.4	20.6	
Imports (H)	122.2	125.2	113.7	111.0	116.8	139.3	151.2	126.2	127.8	
Exports (h)	2.6	2.4	3.6	4.0	3.0	2.4	2.1	3.1	3.0	
<b>Total Supply:</b>	<b>142.4</b>	<b>149.4</b>	<b>148.6</b>	<b>141.2</b>	<b>143.3</b>	<b>159.7</b>	<b>172.5</b>	<b>151.6</b>	<b>145.5</b>	
HPM as % of Total Supply	16.0	17.8	25.9	24.2	20.6	14.2	13.5	18.8	14.2	
<b>Plums:</b>										
Home Production Marketed (HPM)	9.3	5.3	14.8	12.6	15.1	13.6	14.3	14.1	13.8	
Imports (h)	56.0	80.1	68.0	61.0	53.9	51.1	71.6	66.0	72.9	
Exports (h)	1.1	0.8	1.2	1.0	1.0	1.0	1.2	0.4	0.8	
<b>Total Supply:</b>	<b>64.1</b>	<b>84.5</b>	<b>81.6</b>	<b>72.6</b>	<b>68.0</b>	<b>63.7</b>	<b>84.7</b>	<b>79.6</b>	<b>85.8</b>	
HPM as % of Total Supply	14.4	6.2	18.1	17.3	22.2	21.4	16.9	17.7	16.1	
<b>Strawberries:</b>										
Home Production Marketed (HPM)	42.0	37.3	36.6	41.4	47.1	52.5	68.6	73.9	87.2	
Imports (H) (g)	23.5	29.4	28.5	46.7	35.9	40.0	47.3	46.9	66.6	
Exports (h)	0.2	0.2	0.2	0.2	0.3	0.2	0.3	0.3	0.3	
<b>Total Supply:</b>	<b>65.3</b>	<b>66.5</b>	<b>65.0</b>	<b>77.9</b>	<b>82.7</b>	<b>92.2</b>	<b>115.5</b>	<b>121.5</b>	<b>153.6</b>	
HPM as % of Total Supply	64.4	56.1	56.4	53.2	56.9	56.9	59.3	60.8	56.8	

**Table 2**

**VEGETABLES: SUPPLIES OF CABBAGES, CAULIFLOWERS, CARROTS, MUSHROOMS, LETTUCE & TOMATOES  
FOR THE CALENDAR YEAR IN THE UK**

	('000 Tonnes)										
<i>Calendar Year</i>	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
<b>Cabbages</b>											
Home Production Marketed (HPM)	460.1	392.6	387.9	401.9	381.3	400.7	341.5	360.1	309.7	283.6	
Imports (m)	26.3	28.0	15.2	17.3	13.6	12.4	16.1	22.8	15.3	14.4	
Exports (m)	0.1	0.2	0.9	0.4	3.5	1.2	6.4	0.9	0.9	0.7	
<b>Total Supply:</b>	<b>486.3</b>	<b>420.4</b>	<b>402.2</b>	<b>418.8</b>	<b>391.4</b>	<b>411.9</b>	<b>351.2</b>	<b>382.1</b>	<b>324.0</b>	<b>297.4</b>	
HPM as % of Total Supply	94.6	93.4	96.4	96.0	97.4	97.3	97.2	94.2	95.6	95.4	
<b>Cauliflowers</b>											
Home Production Marketed (HPM)	307.6	306.1	311.6	340.7	310.2	289.3	242.8	237.5	195.1	191.7	
Imports (k) (m)	53.3	32.9	33.3	29.3	52.1	70.5	75.9	100.1	98.7	107.9	
Exports (k) (m)	1.0	1.1	2.6	3.0	4.2	7.2	5.8	5.2	8.7	6.4	
<b>Total Supply:</b>	<b>359.9</b>	<b>337.9</b>	<b>342.3</b>	<b>367.0</b>	<b>358.1</b>	<b>352.6</b>	<b>312.9</b>	<b>332.3</b>	<b>285.1</b>	<b>293.1</b>	
HPM as % of Total Supply	85.5	90.6	91.0	92.8	86.6	82.0	77.6	71.5	68.4	65.4	
<b>Carrots</b>											
Home Production Marketed (HPM)	503.2	485.7	543.9	608.2	591.4	632.7	512.4	624.4	623.1	617.6	
Imports (l) (m)	40.0	35.2	49.1	34.3	29.2	37.8	45.7	52.6	29.4	37.1	
Exports (l) (m)	7.0	5.2	7.9	8.3	29.5	27.7	35.5	18.6	31.9	21.3	
<b>Total Supply:</b>	<b>536.2</b>	<b>515.7</b>	<b>585.1</b>	<b>634.2</b>	<b>591.0</b>	<b>642.7</b>	<b>522.5</b>	<b>658.3</b>	<b>620.6</b>	<b>644.3</b>	
HPM as % of Total Supply	93.8	94.2	93.0	95.9	100.0	98.4	98.1	94.8	100.0	97.5	
<b>Mushrooms</b>											
Home Production Marketed (HPM)	106.9	110.9	101.5	106.0	98.9	99.7	101.5	106.6	107.4	108.5	
Imports (m)	27.7	34.0	34.3	36.6	37.0	49.2	51.6	59.2	87.5	62.6	
Exports (m)	0.1	0.3	0.2	1.4	2.4	9.6	6.4	3.4	4.5	3.4	
<b>Total Supply</b>	<b>134.5</b>	<b>144.6</b>	<b>135.6</b>	<b>141.2</b>	<b>133.6</b>	<b>139.2</b>	<b>146.7</b>	<b>162.3</b>	<b>190.4</b>	<b>167.7</b>	
HPM as % of Total Supply	79.5	76.7	74.8	75.1	74.0	71.6	69.2	65.7	56.4	64.7	

	('000 Tonnes)										
<i>Calendar Year</i>	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
<b>Lettuce</b>											
Home Production Marketed (HPM)	253.8	247.1	240.2	249.8	181.9	211.7	223.4	215.2	182.7	172.8	
Imports (m)	83.0	84.0	84.6	90.3	83.4	105.7	128.4	130.9	144.7	145.1	
Exports (m)	0.3	0.5	0.7	1.9	3.9	5.9	4.7	6.1	5.0	6.4	
<b>Total Supply:</b>	<b>336.5</b>	<b>330.6</b>	<b>324.1</b>	<b>338.2</b>	<b>261.4</b>	<b>311.5</b>	<b>347.0</b>	<b>339.9</b>	<b>322.5</b>	<b>311.5</b>	
HPM as % of Total Supply	75.4	64.7	74.1	73.9	69.6	68.0	64.4	63.3	56.7	55.5	
<b>Tomatoes</b>											
Home Production Marketed (HPM)	129.5	134.2	132.8	122.1	110.0	108.4	113.2	116.6	115.0	108.8	
Imports (m)	272.5	253.2	251.2	250.5	167.0	246.6	272.6	290.7	311.7	304.7	
Exports (m)	5.7	5.0	7.2	8.9	4.7	14.4	6.6	7.1	5.5	3.8	
<b>Total Supply:</b>	<b>396.3</b>	<b>382.4</b>	<b>376.8</b>	<b>363.7</b>	<b>272.3</b>	<b>340.6</b>	<b>379.3</b>	<b>400.1</b>	<b>421.1</b>	<b>409.7</b>	
HPM as % of Total Supply	32.7	35.1	35.2	33.6	40.4	31.8	29.9	29.1	27.3	26.6	

	('000 Tonnes)									
<i>Calendar Year</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>1006</i>	<i>2007</i> <i>(Provisional)</i>	
<b>Cabbages</b>										
Home Production Marketed (HPM)	269.1	254.3	282.1	244.0	229.2	221.9	262.7	254.8	214.8	
Imports (m)	14.0	15.8	20.5	20.0	24.5	30.7	18.5	24.7	33.5	
Exports (m)	0.4	0.5	0.6	1.9	0.4	0.3	0.5	1.4	1.1	
<b>Total Supply:</b>	<b>282.8</b>	<b>269.6</b>	<b>302.0</b>	<b>262.1</b>	<b>253.4</b>	<b>252.3</b>	<b>280.7</b>	<b>278.1</b>	<b>247.1</b>	
HPM as % of Total Supply	95.2	94.3	93.4	93.1	90.5	87.9	93.6	91.6	86.9	
<b>Cauliflowers</b>										
Home Products Marketed (HPM)	172.4	156.1	107.4	116.5	126.3	168.3	133.2	123.7	120.5	
Imports (k) (m)	105.8	92.6	115.2	110.7	108.6	116.6	125.4	125.7	102.1	
Exports (k) (m)	7.3	4.6	3.2	5.4	4.1	2.8	5.1	5.3	4.4	
<b>Total Supply:</b>	<b>270.9</b>	<b>244.0</b>	<b>219.5</b>	<b>221.8</b>	<b>230.9</b>	<b>282.2</b>	<b>253.5</b>	<b>244.0</b>	<b>218.2</b>	
HPM as % of Total Supply	63.6	64.0	48.9	52.5	54.7	59.7	52.5	50.7	55.2	
<b>Carrots</b>										
Home Production Marketed (HPM)	673.2	725.8	760.0	718.4	602.4	671.1	710.1	701.3	752.3	
Imports (l) (m)	46.3	41.2	110.6	68.5	49.0	41.0	59.6	49.0	48.1	
Exports (l) (m)	32.1	12.1	16.7	23.9	21.7	17.8	12.1	17.3	18.3	
<b>Total Supply:</b>	<b>687.5</b>	<b>754.9</b>	<b>853.8</b>	<b>763.0</b>	<b>629.6</b>	<b>594.3</b>	<b>757.7</b>	<b>732.9</b>	<b>782.0</b>	
HPM as % of Total Supply	97.9	96.2	89.0	94.1	95.7	96.7	93.7	95.6	96.2	
<b>Mushrooms</b>										
Home Production Marketed (HPM)	104.7	89.9	92.6	84.7	81.0	74.0	69.6	68.0	72.0	
Imports (m)	59.4	68.4	72.4	75.2	99.5	110.2	134.1	105.3	91.3	
Exports (m)	2.2	0.1	0.1	0.2	0.3	0.2	0.2	0.2	0.4	
<b>Total Supply:</b>	<b>161.9</b>	<b>158.1</b>	<b>164.9</b>	<b>159.6</b>	<b>180.2</b>	<b>184.1</b>	<b>203.5</b>	<b>173.2</b>	<b>162.9</b>	
HPM as % of Total Supply	64.6	56.8	56.2	53.1	44.9	40.2	34.2	39.3	44.2	
<b>Lettuce</b>										
Home Production Marketed (HPM)	175.2	154.6	144.8	125.9	142.2	151.4	139.7	134.6	117.0	
Imports (m)	149.4	165.1	167.5	148.7	197.8	182.6	188.4	173.9	154.8	
Exports (m)	6.4	4.3	4.0	4.7	4.6	5.4	6.5	5.8	3.4	
<b>Total Supply:</b>	<b>318.2</b>	<b>315.4</b>	<b>308.3</b>	<b>269.9</b>	<b>335.5</b>	<b>328.6</b>	<b>321.7</b>	<b>302.7</b>	<b>268.4</b>	
HPM as % of Total Supply	55.0	49.0	47.0	46.6	42.4	46.1	43.4	44.5	43.6	



	('000 Tonnes)									
<i>Calendar Year</i>	<i>1999</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>2005</i>	<i>1006</i>	<i>2007</i> <i>(Provisional)</i>	
<b>Tomatoes</b>										
Home Production Marketed (HPM)	116.6	113.0	109.1	100.9	75.6	78.6	78.8	84.1	85.6	
Imports (m)	304.5	288.1	307.3	316.0	341.6	386.7	421.2	443.6	385.3	
Exports (m)	4.7	5.6	4.7	5.3	4.1	4.8	4.5	4.4	4.3	
<b>Total Supply:</b>	<b>416.3</b>	<b>395.6</b>	<b>411.7</b>	<b>411.6</b>	<b>413.2</b>	<b>460.5</b>	<b>495.5</b>	<b>523.3</b>	<b>466.6</b>	
HPM as % of Total Supply	28.0	28.6	26.5	24.5	18.3	17.1	15.9	16.1	18.3	

FRUIT CONSUMPTION, HOME PRODUCTION AND IMPORTS—SUPPLEMENTARY INFORMATION ON SELF-SUFFICIENCY AND SEASONALITY OF SUPPLY

This note provides additional information on UK fruit supply by looking in more detail at UK produced and imported supplies for individual fruit. Total supply is home production + imports—exports and can be interpreted as domestic consumption. The annual statistics are taken from Basic Horticultural Statistics.

1. Annual UK supplies of fruit

A summary of UK production, imports and exports and UK production as a proportion of total supply are given in Table 1 above. This covers a range of different fruits where the level of self-sufficiency can vary between different fruit but overall it has fallen from 18% in 1988 to 11% in 2008. In any individual year, production and the level of imports can be affected by a range of factors including market conditions in the UK and abroad which is affected by factors such as weather conditions, pest and disease pressures, exchange rates and consumer demand.

For all of the fruits there has been a gradual decline in the level of self sufficiency from 1989 which generally reflects a decline in UK production and an increase in imports reflecting consumer demand for a more diverse range of fruits, especially for more exotic produce.

Over the time period 1989 to 2007, the self-sufficiency has reduced from 48 to 33% for apples, from 28 to 14% for pears, from 27 to 16% for plums and from 61 to 57% for strawberries. For fruit in particular the climate often means that the season is limited and imports provide supply all year round although for some of the higher value fruits such as raspberries and strawberries, the season has been extended in recent years by growing fruit under glass.

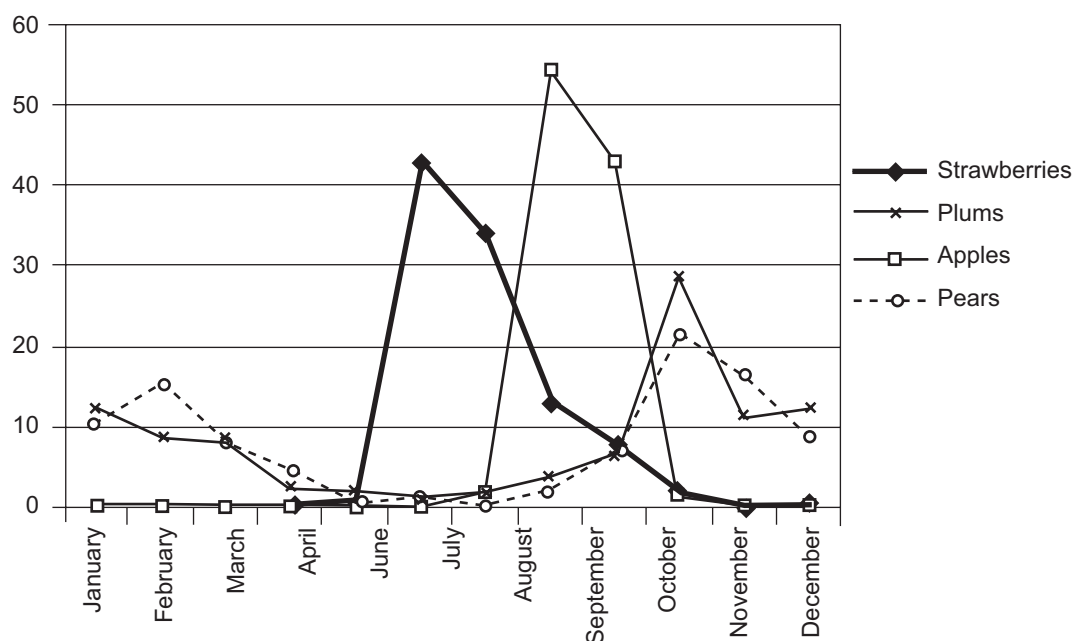
2. Seasonality of supply of UK produced fruit

Figure 1 shows the typical seasonality of supply for UK produced fruit.

The UK season for strawberries is primarily in June and July when approximately 75% of the crop is marketed with some production in August and September. The market for UK plums is concentrated in August and September. The season for UK apples and pears is similar peaking in October and November when approximately 40% of the crop is marketed over these two months but continues through to April on a declining basis with very little further UK supplies in the remaining months.

Figure 1

TYPICAL PERCENTAGE OF TOTAL UK FRUIT MARKETED EACH MONTH



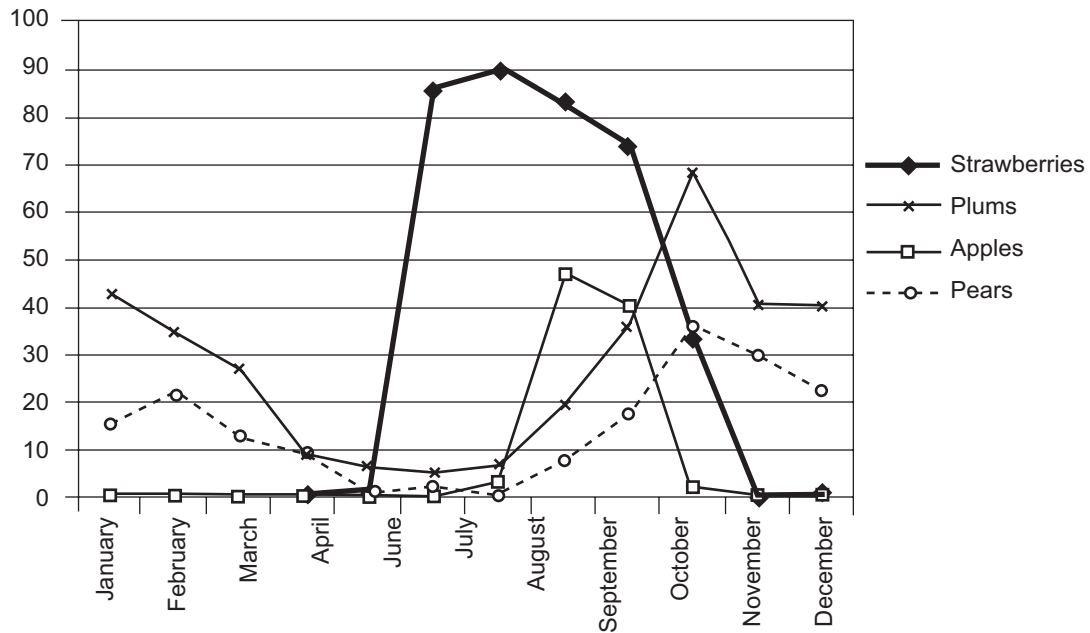
2. Seasonality of supply of UK consumed fruit

Further analysis has been carried out to investigate the supplies of fruit during the year by looking at the split of UK produced and imported fruit on a monthly basis for the most recent years. The typical pattern is presented in Figure 2.

For strawberries when the UK fruit is available primarily in June, July and August it supplies 80–90% of UK demand. For plums the UK crop is available in August and September and supplies approximately 45% of UK demand. For pears when the peak season for UK produced fruit is in October and November, the UK crop supplies approximately 40–50% of the demand, declining to typically 20% for December to February and only 10% in March and April. For apples UK supplies in October provide approximately 60–70% of the demand, falling away to 40–50% in November to February, 30% in March and less than 10% in the remaining months.

Figure 2

TYPICAL UK PRODUCED FRUIT AS A PERCENTAGE OF TOTAL SUPPLY ON A MONTHLY BASIS



June 2009

# Written evidence

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## Memorandum submitted by Wyndham Rogers-Coltman, OBE (SFS 02)

1. The current food supply system is only robust given a regular supply of fuel to home grown food growers and suppliers and uninterrupted imports by air and sea which is dependent upon a guaranteed fuel supply and good labour relations and civil stability in supplying countries. Nationally we have virtually no control over these factors. In addition the continuity of supply of home grown foods is very vulnerable to commodity prices over which growers have no control and which are often controlled by other countries' tariff, export and farm support policies. The great strength of our home grown food supplies is a bunch of skilled and dedicated farmers who continue to grow food to their best ability against all the odds of uneconomic prices and government interference through EU and National policies, including, in particular, environmental policies.

2. Britain cannot feed itself and would only be able to do so, according to work done at Newcastle University, if the whole population ate only vegetarian foods.

3. Challenges affecting aspects of UK food production:

- (a) Soil quality. The biggest factor threatening the ability of our soils to continue to produce high quality food in economic quantities is the world shortage of Phosphate and Potash and our dependence on foreign supplies. The normal balance of fibre and mineral elements in soil can be preserved virtually forever by good farming practice. The elements extracted by plants and not returned to the land cannot be replaced without artificial inputs. Over intensive farming brought about by low commodity prices and their associated consequences such as larger and larger machinery is a considerable threat to soil quality.
- (b) Water availability is a national asset which we must work hard to preserve. Over abstraction from small supplies is a real threat which can be countered by winter fed storage reservoirs but these can only be established through government policies and financial incentives. Policies which take into account regional vulnerability and prioritise accordingly are essential.
- (c) The marine environment in the seas surrounding the UK was a national treasure which has been sacrificed upon the altar of European greed and political opportunism. We used to be masters of marine conservation and could be so again if we could wrest the establishment and enforcement of conservation policies back from Brussels where they are unduly influenced by trade-offs between members which often have nothing to do with the best interest of our marine environment.
- (d) Our science based agricultural research has become a pawn of expediency. It must once again become a national priority. The problem is that the lack of profitability and the diversity of interests within the industry prevents the private sector from funding the research needed. This means that government funded research is the only viable option. It is essential for the security of our limited share of our national food supply market that Government gives agricultural research a high priority.
- (e) Voluntary, cooperative training groups have always been a strength of our industry but their future is threatened by the lack of economic viability.
- (f) Trade barriers can only be dismantled on a world-wide basis. The state of current trade talks indicates the difficulties associated with obtaining international agreement which is robust and sustainable even within periods of food scarcity such as we experienced in 2007–8.
- (g) There is no viable alternative to private ownership and management of the agricultural industry. Totalitarian policies for food production have invariably led to food shortages and starvation and, consequently, civil unrest.

4. I suspect that trends in food consumption will continue to be led by price with low price commodities being favoured by a population increasingly susceptible to the economic factors to which they are subjected by governments more interested in the theory of social change as opposed to the health and contentment of their people.

5 & 6. DEFRA is the laughing stock of the industry and, until it gets its act together, will be of no use in furthering the security of food supplies. There is no coherent cross government food security policy. DEFRA appears to be incapable of understanding the problems which producers and consumers face yet they alone design policies to further food security.

7. It is not possible to double national food production by 2050. Even if the government embraced all the most modern and futuristic scientific advances this would not be possible. The fact that our biggest national threat is energy security will ensure the impossibility of this aim even if the natural reserves in our soils and the elements needed to ensure their continuity were sufficient which they are not. DEFRA should concentrate its efforts on ensuring that our national agricultural industry gets a fair crack of the whip in the context of the European Union and international policies.

My presumption in submitting evidence to your committee is based on my experience as, first, a naval officer sailing the seven seas for 13 years in the Royal Navy protecting our shipping lanes, second, as a farmer of 44 years experience, third, as a main board member of the National Rivers Authority throughout the

entire eight years of its existence, fourth, a three year spell as a Countryside Commissioner and, fifth, many years of involvement with start-up businesses on the fringes of the agricultural industry all of which have survived and prosper to this day in whatever form that they might have evolved into.

*Wyndham Rogers-Coltman*

*January 2009*

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### **Memorandum submitted by the RSPCA (SFS 03)**

## **RESPONSE TO EFRA CONSULTATION ON SECURING FOOD SUPPLIES UP TO 2050**

### **EXECUTIVE SUMMARY**

The challenges facing the agricultural industry in meeting future projected global demand for food need to be taken in the context of a sustainable humane agricultural policy, which will include raising farm animal welfare standards. The UK's position on CAP reform is clear and supported by the RSPCA as it is predicated on a sustainable agricultural model. The main challenge here is convincing the EU-27 that a move towards this type of CAP is required post 2013. Welfare improvements in the way animals are farmed have been made in specific sectors such as pigs, chickens and laying hens. However these improvements could be contrary to meeting present forecasted global demand for meat and could put the EU at a disadvantage to products being more intensively farmed in other countries. Further work is required in this area. Scientific data is patchy in what is required from the British livestock industry to meet UK greenhouse gas reduction figures. These data are needed to inform policy but any policy change could also be contrary to the need to meet projected global demand. Finally the economic climate is an important indicator of how consumer demand reacts to financial constraints. Sales of RSPCA Freedom Food products to date are robust showing strong consumer demand for higher welfare products and a desire for a sustainable agricultural model in the UK.

1. The RSPCA is pleased to respond to the consultation looking at what the challenges the UK faces in responding to the call to increase food production by some 50% by 2050. The RSPCA believe that there are three important and competing issues that need to be considered in the question of whether the UK is able to meet projected food supplies in 2050:

The reform of the Common Agricultural Policy

The importation of products from outside the UK and the limits on reducing such products

The impact of the debate on greenhouse gases and its relationship with agricultural products

2. The CAP is at a critical stage in its on-going evolution. The RSPCA agrees that the CAP needs to be reformed to provide support to farmers more efficiently and be responsive to consumer demands, which include assistance to improving animal welfare. Whilst welcoming the 2008 agreement on the Health Check the RSPCA believes that this agreement only tinkered around at the edges of the CAP and did not address the real reform which has to occur if the CAP is to be fit for purpose. The real debate on the future of the CAP will focus on the post 2013 period and has already started. The concern that some countries and interest groups will use the excuse of the need for increased food production to argue against transforming the CAP into a model for sustainable agriculture was highlighted in the autumn of 2008 when the French Presidency issued such a document on the future of the CAP. This proposed the need for new instruments to support production and that the Single Farm Payment is no longer fit for the new challenges being faced, although it is only three years old.

3. The RSPCA believes that the CAP can and should respond to the needs for increased and better (i.e. more humane) food production. These needs must be met by considering sustainability issues such as environment, animal welfare and landscape maintenance. This can only be done by shifting subsidies from Pillar 1 to Pillar 2, where the majority of these targeted payments can be made. It also comes at a time when the Pillar 1 Single Farm Payment is a relic of the old CAP and only seems to deliver a blunt method of payment to farmers that is not targeted either at delivering a sustainable agricultural model or indeed at securing increased food security (hence the French proposal to return to the unreformed CAP where payments were made to farmers simply to produce more and protect farmers from the vicissitudes of global farm prices, particularly on grain. This model resulted in the infamous wine lakes and butter mountains of the 1970s and 1980s and is outdated). At present Pillar 1 payments represent 77% of CAP payments.

4. The terms of the CAP have not changed in over 50 years. The original aim, under the Treaty of Rome, namely to maximise the production of agricultural products has not been altered although debate on agreeing aims for a 21st century CAP started in the past few years. The pro-reform group, which includes the UK but is still a minority of States of the EU-27 want a CAP that delivers benefits to farmers, consumers and is responsive to market demands and fluctuations.

5. There have not been any long term sectoral review studies in the EU on the economic consequences on a livestock industry of adjusting to lower levels of support whilst moving towards a less intensive system. However economic studies in New Zealand, which went from a heavily farm subsidised system to a non subsidised system in a relatively short time period found farm bankruptcies went up in the short term but in the long term it has not affected the global competitiveness of the farming sectors. Whether this model can be applied to the EU has not been tested and further work needs to be done particularly in light of the food security issue.

6. The CAP was successful in helping the farming industry to increase output and put an end to food shortages in the two decades after its establishment. However, this increase in production came at the price of an intensification of farming, with negative consequences for animal welfare, biodiversity and the environment. Two examples will be given. The average milk yield of the dairy cow in the UK increased from 6,000 litres per annum to 18,000 litres over a ten year period to 1998. At the same time there has been increasing levels of welfare problems such as mastitis and lameness in the dairy cow and the UK is thought to have one of the worst rates of dairy cattle lameness in the world. The growth rate for chicken bred for poultry meat has increased hugely over the past four decades.<sup>1</sup> In 1958 a slaughter weight for broiler chicken was reached at 70 days of age whereas by 1996 it was reached at 42 days and is now around 35 days. It is estimated that the reduction to slaughter weight for commercial broilers has been consistently reduced by about one day per year in the past four decades.

7. Over the past ten years in particular EU scientific reports have demonstrated that the welfare of animals contained in intensive systems has been compromised. EU farm ministers have responded to this by deciding measures to reduce the rate of intensification albeit at a sector policy level rather than at a CAP level. Directive 1999/74 bans the unenriched battery cage, a decision agreed in 1999 and finally confirmed during the French Presidency in 2008. Regulation 2001/88 will phase out the sow stall system in the EU by 2013, though it was made illegal in the UK in 1999. Directive 1997/2 prohibited in 2006 the system of keeping calves in crates where movement is restricted and Directive 2007/43 sets a maximum stocking density for chickens for meat, due to enter into force in 2010. So a direction has been agreed at a sector level that farming needs to be responsive to consumer desires for a more humane farming system. One of the consequences of this may be that this is incompatible with achieving food security at a national or indeed EU level even on those sectors such as pigs, eggs and beef where the EU has to date been self sufficient.

8. So any debate on food security needs to look at the flexibility and direction of global trade rules. The UK is one of the foremost proponents of agricultural liberalisation, a position underlined in the 2007 Government paper *Vision for the Common Agricultural Policy*. Whilst the RSPCA also agrees with the concept of trade liberalisation the two goals as set out in the paper of producing high welfare standards and being internationally competitive in all sectors without subsidy or protection are often incompatible. There is a causal relationship between raising animal welfare standards (within many instances, an explicit increase in costs) and the risk of being undermined by imports from third countries where standards maybe at a lower level. This will lead to the industry becoming uncompetitive in its own market place let alone in the export market and of course effect national food security.

9. There are a number of studies showing this relationship and its effect on competitiveness. In the egg sector, there will be an economic consequence of raising welfare standards under Directive 1999/74. Moving from the standard in 1999 this equates to a price differential of about 11p/dozen eggs moving to the enriched cage system, 15p moving to a barn multi-tier system or 36 p/dozen eggs moving to a free range system.<sup>2</sup> Economic research on laying hen standards in the third countries expected to export to the EU shows that standards are more intensive than the 750 cm<sup>2</sup> space allowance per bird that will apply from 2012 in the EU. It reveals a competitive advantage from the main exporting countries. Those using a standard of 350 cm<sup>2</sup> would have a price advantage in the trade in dried eggs of 3p before any changes in the DDA are enacted. Any agreed changes in tariff reduction will decrease the competitiveness of the EU egg industry.

10. Similar economic analysis has occurred in the broiler sector<sup>3</sup> and the pig sector.<sup>4</sup> In the broiler sector, economic analysis shows that there will be a 11% increase in cost of production from the present broiler stocking density of 38 kg live wt<sup>2</sup> to a reduced stocking density of 30 kg lw/m<sup>2</sup>. This equates to an annual cost to UK industry of £101 million. Even keeping the present stocking density but not allowing the practice of thinning the birds (taking out birds during the growth cycle as the maximum stocking density is reached) would cost the industry in the UK £42 million annually. In the pig sector analysis of the difference between sow production under a higher welfare scheme in Germany and the baseline standards shows a difference of £8.45 in production costs per weaner.

<sup>1</sup> Walker *et al* 2005. *Limits to performance of poultry* in Sylvester-Bradley & Wiseman Yields of farm species constraints and opportunities in the 21st century. Nottingham UP.

<sup>2</sup> The Case against Cages 2005 RSPCA, Hard boiled Reality 2001 RSPCA.

<sup>3</sup> The economic consequences for the broiler industry of legislatively enforced reductions in maximum stocking density. Centre for Rural Research, Exeter Univeristy 2005.

<sup>4</sup> Effect of higher welfare standards on the costs of producing beef and pork in the EU. Bondt *et al* 2004 Agricultural Economics Research Institute The Hague.

11. This is an issue that needs to be addressed as, despite the failure to date of the Doha Development Round negotiations after eight years, it is likely that during the next 10 years agriculture will become more open to global competition as tariffs are reduced. Bilateral agreements will fill the vacuum of any WTO failure. The EU is currently discussing bilateral agreements with ASEAN, Canada, the Republic of Korea and the Andean Community.

12. The European Commission has made it clear that it is committed in bilateral trade negotiations to ensuring the issue of higher welfare standards are addressed in such agreements. The existing agreements which have language contained in them on ensuring compatibility in animal welfare standards and could be a useful model of how to ensure that the twin goals of improving animal welfare and trade liberalisation can occur in parallel.

13. The final part of the jigsaw is the effect of greenhouse gases and climate change both on and from farming which has created new challenges for policy demands. This is in the early stages of being tackled and its implications on food security is an area still being looked at. The 2008 report from the Committee on Climate Change placed agricultural emissions in the UK as fifth most important emission source (after power stations, residential, industry, transport).<sup>5</sup> Its main recommendation was that the government develop a policy framework as agriculture policy was at an earlier stage than any other sectors. Some of the recommendations from the report such as creating a decline in UK emissions by measures such as use of using new technology or eating less carbon intensive types of meat obviously impact on food security.

14. The RSPCA believe that further research is required in the area of assessing the impact of different diets or farming methods on specific greenhouse gas emissions, and also ensuring that any mitigating effects arising from policy decisions should be proofed against effects on animal welfare and the environment.

15. The European Parliament's Committee on Climate Change in their December 2008 report again recognises that the cultivation of cereals and soya as feed for livestock is responsible for substantial greenhouse gas emissions, and asks for a switch from intensive livestock production to extensive sustainable systems. However this switch, which the RSPCA would support, is incompatible with the present increases that are occurring in total global meat consumption and in particular the rises in poultry and pig production in developing countries such as India and China. World meat production is expected to double by 2050 and is growing highest in developing countries particularly for pigs and chickens which grew by 75% in the past five years.<sup>6</sup> The switch also seems to be incompatible with calls for better food security at a national or EU level and is a policy decision that could be difficult to implement.

16. However the 2005 report from the UN's Food and Agriculture Organisation, whilst recognising that livestock ruminants particularly those in developing countries produced large amounts of greenhouse gasses which was unsustainable, called for a reduction in livestock greenhouse gasses by proposing the reduction would be achieved by the intensification and industrialisation of livestock production as the long term outcome.<sup>7</sup> Clearly some policy direction is required.

17. The majority of the UK's 20% decline in non CO<sub>2</sub> emissions from agriculture that is predicted out of the 1990–2010 period to be largely met by the reforms to the CAP (mentioned in paragraphs 2 and 3) which introduced various reforms to the dairy payments and introduced in the UK a decoupled Single Farm Payment. This reduced the number of farm animals, particularly cattle. The numbers of dairy cattle in the UK fell by 28% in the 15 years to 2005 from 2.8 million to 2.0 million cows,<sup>8</sup> a decline which continues. The UK herd fell by 4.5% between June 2005 and 2008 to 1.9 million dairy cattle.<sup>9</sup> The rate of decline is comparable to France and Italy, two of the other main dairy producer countries in the EU which lost 26% and 29% respectively of their dairy cattle population in the same time period (1990–2005).

18. The dairy and beef herd example shows clearly the conflicting effects between the CAP reform, combating reduction in agricultural greenhouse gas emissions, improving animal welfare and providing for food security.

19. The decline in the UK's dairy herd has created self sufficiency and supply issues for the UK's beef industry as in the past over half the UK's beef has been sourced from calves born to dairy cows. A long term drop in dairy beef production is inevitable in the latter part of this year due to the shortage of dairy heifers. As UK beef cattle numbers also continue to decline, it is predicted that this will result in a drop of 19% in UK beef production by August-December this year. The dairy sector reform agreed as part of the Health-check package in 2008 could have an additional negative impact on the beef sector. The RSPCA has been advocating the absorption of black and white (Holstein-Friesian) bull calves into the UK's finishing beef system to fill this hole, animals which are currently shot at birth on farm but high grain prices have previously made this uneconomic.

20. Finally the current economic climate has given some useful information on consumers' reactions to higher welfare food and organic food. Organic food has seen a slump by about 20% in the past year (2007–8) and is projected to drop a further 50% by 2010. This seems to be related to the current economic situation

<sup>5</sup> The Climate Change Committee *Building a low carbon economy—the UK's contribution to tackling climate change* 2008.

<sup>6</sup> FAO world report 2008.

<sup>7</sup> Steinfeld H, Gerber P, Wassenaar T, Castel V, Rosales M & de Haan C. 2006. *Livestock's long shadow: environmental issues and options*. FAO.

<sup>8</sup> Eurostat 2008.

<sup>9</sup> DairyCo Datum 2009.

and anecdotal information suggests that shoppers are moving away from organic meat products into higher welfare products such as Freedom food. This may be related to price (Freedom food products are priced invariably between baseline standards and organic standards) but no qualitative work has been done on this.

21. To date the economic climate doesn't seem to be acting on Freedom Food sales which seem to be holding up and in some areas such as chicken, pigs and eggs are reporting year on year growth in numbers of animals covered (2007–8) of 25%, 13% and 6% respectively. It isn't clear yet if this divergence between sales in organic and Freedom Food will continue into 2009, though it is expected that sales of Freedom Food chicken and pigs will remain robust on the back of the Channel 4 programmes on food due to air in January. The RSPCA believe that these data show that consumers still choose higher welfare products in economically challenging times and underlines the importance of provenance in food to consumers.

22. In conclusion, it is unclear how the UK Government, which is committed to trade liberalisation, a strong British agricultural sector to meet increasing global demand and raising welfare standards will ensure that these difficult and possibly conflicting relationships will be effectively addressed. The UK has been very clear in the direction it desires for the CAP but a clear policy direction to address the issues above and in the context of meeting UK greenhouse gas agricultural reduction targets, is required.

January 2009

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**Memorandum submitted by LandShare CIC (SFS 04)**

**ENLIGHTENED AGRICULTURE AND THE NEW AGRARIANISM: COMMON SENSE,  
SOUND HUSBANDRY, AND SCIENCE-ASSISTED CRAFT**

**EXECUTIVE SUMMARY**

Britain's overall role is, and always has been, both to look after its own people and the fabric of its landscape, and to contribute to the wellbeing of the whole world. These twin ambitions should not be at odds. This paper shows how we can secure our own food security over the next century while helping to ensure that everyone worldwide is well fed.

Simple biological calculation shows that it should be possible to feed everyone who is ever likely to be born on to this Earth to the highest standards of nutrition and gastronomy. To achieve this we need to design farming specifically to feed people—and to do this without wrecking the rest of the world, which is what “sustainability” implies. Such farming must be founded in sound principles both of common morality and of biology (ecology) and in this paper is called *Enlightened Agriculture*, or EA. EA perforce is labour-intensive, meaning that all countries worldwide need a strong agrarian base. Thus this paper also envisages *The New Agrarianism*, achieved via a process of Renaissance. The New Agrarianism is not an exercise in nostalgia, a simple return to the past, but a concerted attempt to make good farming possible and agrarian living attractive. Good science and some high technologies are needed for this—but designed to abet good husbandry and not, as now, to replace it. This leads us to the essential principle of *Science-Assisted Craft*.

With EA, Britain and most other countries could achieve *Agricultural Self-Reliance* (not to be confused with total self-sufficiency) and it would be good for humanity and the world as a whole if they did so.

Since EA is labour-intensive and labour is the most expensive input in labour-intensive farming, EA and the New Agrarianism cannot be realized within the present economy, based on the maximization of wealth in the form of money, with focus on productivity, comparative advantage, and cash efficiency. Although farms should be conceived as traditional businesses, with rivalry between them, the overall economy of agriculture must be primarily cooperative, and it must be sequestered from the fluctuations of the global market. We cannot, as in Britain in recent months, allow the price of oil to compromise our food supply or (as with the rise and fall of set-aside) to determine the fate of our wildlife.

**I. THE GOAL AND THE BEDROCK PRINCIPLES**

I.1. The moral and practical task before all humanity is to provide everyone with good food, forever, without wrecking the rest of the planet. “Good Food” implies sound nutrition and excellent gastronomy. “Sound nutrition” is as defined by nutritionists. Excellent gastronomy should be as defined by each individual culture in accord with its own landscape and history.

I.2. In addition, all societies worldwide should have control over their own food supply—i.e. should not depend for sustenance on the capability or good will of third parties over which they have no firm control.

I.3. The economy—indeed all human activity—needs to be rooted in morality and biological reality. In the present world we have lost sight of this. Capitalism per se has often been blamed but in truth the fault lies with the peculiar, abstracted version of capitalism developed since the 1960s. This model treats the economy almost entirely as an exercise in money, and elevates the market to the role of universal arbiter.



Morality has become a matter of market forces: apart from a few taboos, whatever people are prepared to pay for is considered acceptable. Biological realities are all-but abandoned, in the apparent and sadly mistaken belief that science and high-technology allow us to shape the world in any way we please.

## II. THE STATUS QUO

II.1. The vogue in agriculture is for more and more industrialization. Human labour is replaced as far as possible by machinery, industrial chemistry, and biotechnology. Industrialization requires simplification (“one size fits all”) and hence encourages and requires monoculture. Hyper-industrialized, low-labour, monocultural agriculture is still not the norm worldwide but is nonetheless called “conventional”. Its emphasis is on productivity, value-adding, cutting costs, cash efficiency, and overall profitability. The whole exercise, with some notable anomalies, is framed by the global economy which is intended, at least in principle but only sometimes in practice, to be ultra-competitive, with the least profitable going to the wall. Ricardo’s principle of comparative advantage applies: countries that can grow high-value commodity crops are encouraged to focus on export. Britain has no particular agricultural advantages but has been rich in cash and politically influential and it has often been suggested in recent decades that British farming should be allowed to go the way of its mining. It has been cheaper to buy what we need from abroad—and so that has been considered to be the right, the “realistic”, thing to do.

II.2. Yet the “conventional” model is clearly failing. The UN calculates that out of a present world population of 6.5 billion more than 800 million are chronically undernourished while around one billion eat too much, largely of the wrong things—prompting the UK government’s latest health drive. In all, therefore, nearly one third of humanity is badly served. Another estimated one billion live in urban slums—most of them ex-farmers and their families driven out by the industrialization of agriculture, and finding no useful employment in the city.

II.3. At the same time, essential inputs to the present industrialized systems are under threat, including fossil fuel, fresh water, and phosphate. Global warming poses many threats. The loss of some of the world’s most fertile, coastal strips is the most obvious danger, but we should not underestimate the effects of novel climate on the physiology of existing crops. (Will it even be possible to grow existing varieties of wheat in the Canadian wheat belt? Would it be possible to provide replacements in time? The apparent belief that GM technology can provide new crops instantly is sadly misguided).

II.4. UN demographers estimate that the world population will reach 9 billion-plus by 2050. Since the present system fails to cater even for 6.5 billion it seems that the problems can only grow more acute. Numbers are predicted to stabilise by 2050, however—so this is the most we should ever have to cater for. So long as world agriculture is shaped by the global market that seems impossible, however much high technology we throw at the problems. With EA, that seems eminently manageable. Structure is all—and there can be no excuse for failure.

## III. OPTIONS AND POSSIBILITIES

III.1. Three possibilities seem to be on the agenda:

III.1.1. Continue with the present policy of agricultural industrialization. Common sense and the most sober statistics suggest that this is not an option if we seriously want to avoid disaster in the long term.

III.1.2. A “sustainable industrialized” model. Britain’s Lord (John) Krebs has suggested this. This approach sounds sensible and is not too radical—continuing the present scientific, economic, and social assumptions, and changing only the technology. However, such systems are entirely untried—they remain “blue skies”—and there is good reason to doubt whether the present scientific, economic, and social assumptions on which it is based, are sound.

III.1.3. The third possibility is the one mooted here: To develop “Enlightened Agriculture” within the context of national economies worldwide that each have a strong agrarian base. This is “The New Agrarianism”.

## IV. ENLIGHTENED AGRICULTURE

IV.1. Enlightened Agriculture is agriculture that is designed expressly to feed people, now and in the long term, without wrecking the rest of the planet and destroying our fellow creatures. If agriculture was so designed, then it should easily be possible to provide everyone with good food at least until the next mega-volcano or asteroid, or runaway global warming, change the rules absolutely. Biologically speaking, given reasonable luck, a good life for all for the next million years is a reasonable target. In this context, a century should be seen as a standard if rather small unit of political time.

IV.2. In essence, Enlightened Agriculture is straightforward. To maintain long-term productivity, farming must be founded in principles of sound biology—as, of course, is nature itself. The farmer must play to the strengths of crops, livestock, landscape and climate—not seeking to re-design these essential components in line with some economic or political ideal.

IV.3. In practice, the focus must be on staple crops which provide most of humanity's energy and protein; notably cereals, grown on the arable scale. Vital too is horticulture—vegetables and fruit. Livestock should then be fitted in as and when: ruminants (mainly cattle and sheep) kept on land that does not lend itself to arable (hills or saltmarsh—or in the world as a whole in semi-desert); omnivores (pigs and poultry) fed on leftovers and crop surpluses. This is commonsensical, and is the traditional pattern. In addition, *all* agriculture should be conceived as an exercise in agro-forestry: crops and livestock integrated in many different ways with trees. Thus Enlightened Agriculture is an advanced exercise in “polyculture”; a complex interplay of mutually supportive crops and livestock. The overall effect is to achieve what might be called “biological efficiency”: hard to define precisely (as biological concepts always are) but easy to envisage intuitively.

IV.4. Here we encounter two wondrous serendipities. For farming thus conceived produces plenty of plants (both arable and horticulture), not much meat (the animals take second place to arable and horticulture) and maximum variety (since biological efficiency is achieved by the interplay of many different species and varieties of crops and animals in an infinity of different topographies and microclimates). “Plenty of plants, not much meat, and maximum variety”—these nine words summarize the best of nutritional theory over the past 40 years. They also summarize the general balance of ingredients in all the world's greatest cuisines—Italy, Provence, Turkey, India, China, all of which use meat only for garnish, stock, and occasional feasts. Hence “Enlightened Agriculture”—designed to get the most out of the landscape—is also the basis of sound nutrition and the world's finest cooking.

IV.5. In short, we don't even need to be austere to thrive in the long term. Indeed, “The future belongs to the gourmet”. But the principle works only if people take food seriously, as the Italians and Turks still do. Thus it is extremely important to encourage food culture.

IV.6. As a further bonus—although critical studies remain to be done—simple calculation suggests that if every country practiced Enlightened Agriculture then most (including most of those of Africa that are commonly seen to be disastrous) could achieve agricultural self-reliance. In other words, they could produce all the food they need to provide themselves with a good (in all senses) basic diet. The world trade in food would still be important, but would be restricted to crops that exporters can sell for serious profit, in accord with the principles of fair trade, without huge ecological side-effects (such as felling rainforest). For example it would be sensible for self-reliant Britain to import tea from India or coffee from Brazil, but not to import soya grown in Amazonia and the Cerrado, to feed to cattle and pigs.

IV.7. In general, since most farms will be mixed, any one area would produce a wide range of foods. Hence this implies an immediate shift towards local production and consumption, which in principle have many advantages of a nutritional, social, and environmental kind.

IV.8. Enlightened Agriculture is not synonymous with organic agriculture but since organic farming uses minimal material inputs and in general contrives to imitate nature it is innately sustainable and should be regarded as the default approach. Initial calculations suggest that Britain (and most countries) could be self-reliant in food even if it was totally organic (while organic researchers such as Professor Martin Wolfe of Suffolk point out that the organic farming has been shamefully under-researched and its possibilities have yet to be realized).

IV.9. Yet there are often times when “non-organic” techniques and approaches can be extremely helpful, and we certainly should not close the door on novel technologies as a matter of principle. Indeed we can envisage many more. For instance, it would surely be worthwhile to explore ways of producing artificial nitrogen fertiliser using solar energy. In a similar, pragmatic vein we should not write off GMOs *a priori*. Though present uses are for the most part of very dubious value, it is still possible to envisage ways in which they could be helpful—for example to provide super-drought-resistant sorghum for the Sahel: a proposal mooted in the 1980s but not so far brought anywhere near to fruition.

IV.10. But we cannot allow agriculture (or any human endeavour) to be technology-led—buoyed along by the rhetoric of “progress” and the promise of profit. In all endeavours—and very obviously in agriculture—the first requirements are for sound motivation and sound structure. We should heed for example the comments of Professor E R (Bob) Orskov of the Macaulay Institute, Aberdeen, who is one of the world's outstanding animal nutritionists and travels the world as an agricultural adviser. He does not condemn GMOs *a priori* but simply says that in 25 years of travel he has never come across a problem where GM would have been the best solution. He maintains that world production could be doubled or tripled simply by giving appropriate help to existing, traditional farming systems—and has often demonstrated the principles that would make this possible.

IV.11. However, because Enlightened Agriculture depends on the interplay of many species and varieties it is necessarily complex. Therefore it needs a great deal of expert husbandry. That is: it must be labour intensive. In addition, because EA is polycultural, there are no great advantages in scale-up. Hence the standard farm unit should be small to medium-sized. In structure, then, Enlightened Agriculture looks very like traditional agriculture, with its labour-intensive, small (ish) mixed farms. Structurally, EA would be the complete antithesis of the present-day, vast, monocultural units that operate with minimal labour (and are entirely dependent on big machines and industrial chemistry which in turn require vast inputs of oil). In

detail, as already intimated, EA is not necessarily traditional: in many respects it could be far more high-tech than the present. Nonetheless, EA implies a change of mindset. In EA, farming is regarded primarily as a craft, as again was traditionally the case. In EA the role of science is to abet that craft. Science would not be deployed, as now, as a means to industrialize the craft out of existence in the interests of big business.

IV.12. The shift from high-tech, industrialized monoculture to high-tech but labour-intensive polyculture obviously requires a complete shift not simply in technology but in the economy and social structure. It calls, indeed, for an Agrarian Renaissance, leading to the New Agrarianism.

## V. THE NEW AGRARIANISM

V.1. Some thinkers—notably Lord Krebs—acknowledge that the present, industrialised, “conventional” model is unsustainable, but argue that what the world really needs is sustainable industrial models. On the face of things this looks very sensible, being closer to the status quo and therefore (it seems) easier to achieve. But it is not clear what such a model would look like, and it is not obvious why it should *a priori* be preferred to the agrarian model, which in most of its essential elements has been tried, tested, and refined over the past 10,000 years. In general there seems to be a prejudice against agrarian living and towards urbanization that has not been properly questioned.

V.2. If the norms of the cash market are allowed to prevail then the high labour requirement of traditional (and enlightened) agriculture is perceived as a disadvantage, because it is costly. If we ask, sensibly, how the vast proportion of the nine billion people who will be with us by 2050 are to earn a living in an age when rapid expansion of oil-dependent industry is no longer an option, and acknowledge that unemployment is the royal road to poverty, then the labour-intensiveness of EA emerges as a distinct bonus. Humanity needs to ask, “What proportion of the labour force in any one country *should* be working on the land?” The proportion in the present world ranges from less than 1%, in Britain and the US, to 90% in Rwanda, with the Third World as a whole averaging 60%. Ninety per cent is clearly too many—but Britain’s less than 1%, though commonly seen these days as the near-ideal, in truth is on the brink of disaster. Common sense suggests that no country should have more than 50% of its people on the land—but also that none should have fewer than 20%. But—to re-emphasise—critical studies are vital, and urgent.

V.3. But if Britain really does need 20% of its workforce on the land then (a) we need to increase the present workforce—and particularly of skilled farmers—by around 20 times: and (b) we need to make huge adjustments to the structure of the countryside and the laws surrounding it.

V.4. It is also clear that Enlightened Agriculture cannot come into being within the present economic climate. The present-day, largely laissez-faire market requires traders of all kinds to maximize output, maximize value-adding, and (above all) to minimize costs and hence is as antipathetic as can be conceived towards the principles of Enlightened Agriculture. Agriculture worldwide has been thrown to the market wolves. In practice, if we are serious about feeding the world and the long-term future, we need to do the complete opposite: to create a sequestered economic environment in which EA can flourish. To be sure, the EU and US subsidies of the past few decades have worked badly, and reinforced the view that the free market must be preferred to market control. But these subsidies failed because they have been almost unbelievably crude. Properly controlled markets are far more complex.

V.5. In short, the world needs agriculture that is designed according to the bedrock principles of biology and is designed expressly to feed people; to achieve this, we need an agrarian renaissance; and for all this to work we need a new, sequestered, economic structure. There seems to be work here for governments. So what in practice should the British government be doing?

## V. ACTION FOR THE FUTURE AND THE ROLE OF GOVERNMENT

V.1. Clearly the task is twofold: to develop the concept of Enlightened Agriculture, with all the necessary research—biological, social, economic; and to bring about the Agrarian Renaissance, to enable EA to happen. Government has key roles to play in this—both negative (not inhibiting existing, helpful initiatives) and positive (encouraging new initiatives).

V.2. A key issue of a positive kind is to re-establish science as the servant of humanity at large, and not simply as the domain of big business. As far as is now possible, the network of government-run agricultural research stations and experimental husbandry farms that Britain possessed in the early 1970s (and were indeed the envy of the world) should be restored.

V.3. In particular, Britain and the world would also benefit from a dedicated “College of Enlightened Agriculture” intended to address all the vital issues that have been neglected, or to initiate and coordinate studies elsewhere. These studies are in part scientific (for example into biological pest control); in part practical (perfecting methods of husbandry); in part social and economic (for example to establish desirable ratios of agrarian to urban workers and the economic consequences of different systems).

V.4. It is the case, however, that most of the initiatives of the past three decades that are truly helpful, and could bring benefits in the future, have been carried out by non-profit organizations and by individuals. Examples include the Soil Association and the Organic Research Centre; Compassion in World Farming; the Food Animal Initiative, based in Oxford; the simple and universally applicable system of agro-forestry

developed by Martin Wolfe in Suffolk; the studies of traditional agriculture and its possibilities by Professor Orskov; and—encouraging the essential food culture, without which good farming cannot flourish—the Slow Food Movement (which is based in Italy but is becoming established in Britain).

V.5. There have been many initiatives, too, of a kind that could help to create the new and much expanded cadre of farmers who are now so urgently required. In the UK these include Community Supported Agriculture (CSAs) as developed for example by Martin Large and Greg Pilley of Stroud Commonwealth; the conception of the farm as a multi-faceted centre of the community, for example by Tim Waygood in Hertfordshire; and LandShare, established in 2008 as a means to identify and encourage such initiatives in general.

V.6. In general, many of the non-government initiatives are attempts to overcome restrictions on good farming and on agrarian living that have been imposed by the political and economic climate of the past 30 years. Few individuals can now afford to buy worthwhile parcels of land, and hence the renewed interest in CSAs and co-operatives. Part-time farming is potentially of huge importance and so should be researched and encouraged (since Enlightened Agriculture is not intended primarily to generate wealth and personal fortunes). For those seeking to work afresh on the land accommodation has become a huge issue. The government needs to revise or remove many of the restrictions on building the necessary, eco-friendly, generally small buildings required. Similarly, health and safety restrictions are often designed primarily for large-scale industrial units and are not appropriate to more labour-intensive systems—and must be reviewed.

V.7. Perhaps most challenging, intellectually and politically, is to create the sequestered, economic structure needed to enable EA to be practiced. But again there are pointers, which the government could encourage. These include the initiatives in complementary currency, for example by Margrit Kennedy in Germany, Bernard Leitaer based in Belgium, and Richard Douthwaite in Ireland; and the more general explorations of the New Economics Foundation in London. In truth, although the economic transformation required is radical, the forms envisaged are not unprecedented and are not innately frightening. Most importantly, the quarrel is not with capitalism *per se*, but with the anomalous, abstracted, simplified form of free-market capitalism that has prevailed since the 1970s, a form that many conservative business people abhor.

## VI. CONCLUSION

It really should be possible to feed everyone who is ever likely to be born on to this Earth to the very highest standards of nutrition and gastronomy, forever. Since this is possible, common morality demands that the attempt should be made. The key is to conform to the principles of sound biology, that underpin the Earth as a whole, and to respect the Earth's physical limitations. The attempt to impose a new set of principles based on the cash market and in the belief that the Earth and its creatures can be fashioned at will and ad infinitum, is a disaster. There are clear and obvious ways in which the UK could take a lead, both for its own people and for the world as a whole. These possibilities should be pursued as a matter of urgency.

### *The author*

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*Colin Tudge*

*January 2009*

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## Memorandum submitted by Compassion in World Farming (SFS 05)

### EXECUTIVE SUMMARY

1. Concerns about food security are leading to calls by some for further intensification of livestock production. Compassion in World Farming is opposed to this as it would lead to serious animal health and welfare problems. To take one example, moves to increase productivity could well exacerbate the health problems that already arise from genetic selection for production traits such as fast growth or high yields. Fast growing pigs and meat chickens suffer from leg disorders and cardiovascular malfunction<sup>10</sup> and high yielding cattle from lameness, mastitis and premature culling. We do not wish to see an escalation of such problems.

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<sup>10</sup> Scientific Opinion of the Panel on Animal Health and Welfare on a request from the Commission on Animal health and welfare in fattening pigs in relation to housing and husbandry. *The EFSA Journal* (2007) 564, 1–14.

2. The question of food security is most helpfully examined from a global viewpoint as the FAO predicts that between 2001 and 2050 global meat and milk consumption will approximately double. It is likely that much of this increase will be provided by industrial methods of livestock production unless there is a clear policy decision to move away from such methods.

3. A strategy designed to substantially increase global meat and dairy output through farming animals industrially is simply not sustainable. Industrial livestock production not only pollutes the environment but is extremely wasteful in its use of land, water and fossil fuel energy. It also threatens food security as several kilos of cereals need to be fed to animals to produce 1 kilo of edible meat. People could be fed much more efficiently if those cereals were used for direct human consumption. In addition, the livestock sector is a major producer of greenhouse gas (GHG) emissions, while western levels of meat consumption increase the incidence of certain cancers, heart disease and obesity.

4. Nutritional benefits would arise from a change from intensively produced chicken to birds reared free range. Chickens reared indoors are significantly more fatty than free range chickens.

5. Industrial livestock production systems fuel animal disease as they allow the rapid selection and amplification of pathogens and facilitate disease transmission among animals. The FAO points out that industrial livestock production plays an important part in the emergence of highly pathogenic avian influenza and other diseases.

6. Attempting to feed the growing world population by increasing industrial livestock farming is not a realistic strategy as it will place land, water and energy under increasing pressure. A more judicious approach is to re-orient the world's animal production away from industrial farming and towards lower-input, more extensive systems. This needs to be accompanied by a reduction in meat and dairy consumption in developed countries; this will lessen the need to produce increasing amounts of meat and milk and also help to prevent a rise in the GHG emissions produced by the livestock sector. A reduction of meat consumption in rich countries would allow poorer countries to increase their consumption according to their dietary needs.

#### DETAILED SUBMISSION

7. Concerns about food security are leading to calls by some for further intensification of livestock production. Compassion in World Farming is opposed to this as it would lead to serious animal health and welfare problems. To take one example, moves to increase productivity could well exacerbate the health problems that already arise from genetic selection for production traits such as fast growth or high yields. Fast growing pigs and meat chickens suffer from leg disorders and cardiovascular malfunction<sup>11</sup> and high yielding cattle from lameness, mastitis and premature culling. We do not wish to see an escalation of such problems.

8. In addition, we believe that industrial livestock production in reality undermines food security because it is wasteful of the increasingly scarce resources of land, water and energy.

9. The question of food security is most helpfully examined from a global viewpoint bearing in mind the FAO's prediction that between 2001 and 2050 global meat and milk consumption will approximately double.

10. It is likely that much of this increase will be provided by industrial methods of livestock production unless there is a clear policy decision to move away from such methods.

11. Already over 50% of global pigmeat and 70% of chickenmeat is industrially produced.<sup>12,13</sup> Industrial systems have been increasing at six times the rate of traditional mixed farming systems.<sup>14</sup>

12. This submission seeks to demonstrate that a strategy designed to substantially increase global meat and dairy output through farming animals industrially is simply not sustainable. Industrial livestock production not only pollutes the environment but is extremely wasteful in its use of land, water and fossil fuel energy. It also threatens food security as several kilos of cereals need to be fed to animals to produce 1 kilo of edible meat. People could be fed much more efficiently if those cereals were used for direct human consumption. In addition, the livestock sector is a major producer of greenhouse gas (GHG) emissions, while western levels of meat consumption increase the incidence of certain cancers, heart disease and obesity.

13. Much of the detrimental impact of industrial livestock production stems from the need to grow substantial amounts of crops, such as cereals and soya, to feed the animals. These feed crops are produced intensively with the aid of large quantities of synthetic nitrogen fertilisers and pesticides.

<sup>11</sup> Scientific Opinion of the Panel on Animal Health and Welfare on a request from the Commission on Animal health and welfare in fattening pigs in relation to housing and husbandry. *The EFSA Journal* (2007) 564, 1–14.

<sup>12</sup> Steinfeld H *et al.*, *Livestock's Long Shadow: environmental issues and options*. Food and Agriculture Organisation of the United Nations. Rome. 2006 [http://www.virtualcentre.org/en/library/key\\_pub/longshad/A0701E00.htm](http://www.virtualcentre.org/en/library/key_pub/longshad/A0701E00.htm)

<sup>13</sup> WorldWatch Institute. *State of the World 2004: The Consumer Society*. <http://www.worldwatch.org/node/1785>

<sup>14</sup> FAO. *Protecting Animal Genetic Diversity for Food and Agriculture. Time for Action*. Animal genetic resources group, FAO, Rome. n.d. <http://dad.fao.org/cgi-bin/getblob.cgi?sid=230b173a68b7f2af6efeca2d4a86b12e,1>

### Climate change

14. The FAO's 2006 report, *Livestock's Long Shadow* recognises that animal production is a major global contributor to GHG emissions. The report stresses that "the livestock sector is a major player, responsible for 18% of greenhouse gas emissions measured in CO<sub>2</sub> equivalent. This is a higher share than transport."<sup>15</sup>

15. The FAO report states that livestock production is responsible for:

- 37% of global methane emissions (methane has a global warming potential (GWP) 23 times higher than CO<sub>2</sub>)
- 65% of global nitrous oxide emissions (with a GWP 296 times higher than CO<sub>2</sub>)
- 9% of global CO<sub>2</sub> emissions.

16. In addition, 64% of ammonia emissions originate in livestock production and contribute to air, soil and water pollution, acid rain and damage to the ozone layer.<sup>16</sup>

17. In the UK meat and dairy products contribute around 8% of total GHG emissions.<sup>17</sup> Meat and dairy production and consumption account for about 13.5% of total EU-25 emissions.<sup>18</sup>

18. The predicted doubling of global animal production by 2050 will generate huge increases in livestock-related GHG emissions in the coming decades. Nitrous oxide emissions are projected to increase by up to 35–60% by 2030 due to increased manure production by animals and increases in use of nitrogen fertiliser;<sup>19</sup> at least half of nitrogen fertiliser use in industrial countries is for animal feedcrops. New industrial farms for pigs and poultry are predicted to raise global emissions of methane from pig slurry and nitrous oxide from poultry manure.<sup>20</sup>

19. Although the GHG intensity of livestock production varies as between the different species, all forms of livestock rearing produce more GHG emissions than the production of plant foods (provided the latter are produced locally and in season).<sup>21</sup>

### Industrial farming's wasteful use of resources

20. Intensively produced meat is one of the most resource-inefficient methods of producing food for people.

### Use of cereals and soya as feed

21. Around 40% of the world's cereal harvest is used as livestock feed<sup>22</sup> and over 90% of the world's soya crop is grown for animal feed. It is often argued that livestock produce protein, but in reality they waste protein. On average, to produce 1 kg of high quality animal protein, livestock are fed nearly 6 kg of plant protein.<sup>23</sup> According to the USDA, using typical intensive animal rearing methods, it takes up to 2.6 kg of feed to produce 1 kg of chicken meat, 6.5 kg of feed to produce 1 kg of pig meat and 7 kg of feed to produce 1 kg of beef.<sup>24</sup>

22. But in reality feed conversion from animals to meat is even more wasteful than this. The usual feed conversion calculations are either based on the weight of the live animal or on its carcass weight. Neither of these necessarily gives the true picture of the amount of feed necessary to produce 1 kg of edible meat (i.e. excluding parts of the animal that are normally not eaten, such as bone and hide). According to calculations from the University of Manitoba, if we consider the amount of feed required to produce 1 kg of genuinely edible product, the amount of feed required increases substantially. To produce 1 kg of edible meat in the U.S. by industrial methods requires 20 kg of feed for beef, 7.3 kg of feed for pig meat and 4.5 kg of feed for chicken meat.<sup>25</sup>

<sup>15</sup> Scientific Opinion of the Panel on Animal Health and Welfare, *The EFSA Journal* (2007).

<sup>16</sup> Scientific Opinion of the Panel on Animal Health and Welfare, *The EFSA Journal* (2007).

<sup>17</sup> Garnett T., 2008. *Cooking up a storm: food, greenhouse gas emissions and our changing climate*. Food Climate Research Network, Centre for Environmental Strategy, University of Surrey.

<sup>18</sup> EIPRO (2006). European Commission. *Environmental impact of products (EIPRO)*. Analysis of the life cycle environmental impacts related to the final consumption of the EU-25. [http://ec.europa.eu/environment/ipp/pdf/eipro\\_report.pdf](http://ec.europa.eu/environment/ipp/pdf/eipro_report.pdf)

<sup>19</sup> IPCC. *Climate Change 2007: Mitigation of Climate Change*. IPCC 4th Assessment report, Working Group III. Chapter 8, Agriculture. Final Draft pre-copy edit version (for revision) [http://www.mnp.nl/ipcc/pages\\_media/FAR4docs/chapters/CH8\\_Agriculture.pdf](http://www.mnp.nl/ipcc/pages_media/FAR4docs/chapters/CH8_Agriculture.pdf)

<sup>20</sup> United States Environmental Protection Agency (US-EPA). *Global Anthropogenic Greenhouse Gas Emissions: 1990–2020*. EPA, 2006. <http://www.epa.gov/nonco2/econ-inv/international.html>

<sup>21</sup> Williams AG, Audsley E and Sandars DL. Determining the environmental burdens and resource use in the production of agricultural and horticultural commodities. Main Report. Defra Research Project IS0205. Bedford:2006. Cranfield University and Defra. [www.silsoe.cranfield.ac.uk](http://www.silsoe.cranfield.ac.uk) and [www.defra.gov.uk](http://www.defra.gov.uk)

<sup>22</sup> Lundqvist, J., C. de Fraiture and D. Molden. *Saving Water: From Field to Fork—Curbing Losses and Wastage in the Food Chain*. SIWI Policy Brief. SIWI, 2008 [http://www.sivi.org/documents/Resources/Policy\\_Briefs/PB\\_From\\_Field\\_to\\_Fork\\_2008.pdf](http://www.sivi.org/documents/Resources/Policy_Briefs/PB_From_Field_to_Fork_2008.pdf)

<sup>23</sup> Pimentel D *et al.* Reducing energy inputs in the US food system. *Human Ecology* 36:459–471. 2008. DOI 10.1007/s10745-008-9184-3

<sup>24</sup> Trostle R. *Global agricultural supply and demand: factors contributing to the recent increase in food commodity prices*. USDA ERS May/July 2008 <http://www.ers.usda.gov/Publications/WRS0801/WRS0801.pdf>

<sup>25</sup> Smil V. *Feeding the world: a challenge for the twenty-first century*. MIT Press, 2000.

23. The pressure on land to grow the feed crops needed for industrially farmed animals is set to intensify as a result of the growing world population and increasing demand for meat and dairy products in developing countries. In addition, rising temperatures caused by climate change could reduce crop yields.<sup>26</sup> Climate change is also likely to lead to a rise in sea level and a consequential loss of agricultural land.

#### *Excessive use of water in meat and dairy production*

24. The FAO points out that the world is moving towards increasing problems of freshwater shortage, with 64% of the population expected to live in water-stressed basins by 2025.<sup>27</sup>

25. Intensive livestock production places heavy demands on water resources. The production of feedcrops, mainly used for intensive animal production, takes 88% of all the water used for livestock.<sup>28</sup> According to the FAO “water use is strongly dominated by the more intensive livestock sector through the production of feedcrops”.<sup>29</sup> A 2008 report from the International Water Management Institute states that “The production of meat from animals fed on irrigated crops has a direct impact on water resources, much more so than if the meat is derived from grazing animals and animals fed on residues”.

26. The “water footprints” of animal products are in general much higher than the “water footprints” of vegetable products.<sup>30</sup> At a time when water for agriculture is at a premium and is expected to become scarcer, using water to expand intensive livestock production globally will be difficult to justify. Alternatively, the water may simply not be there to use.

#### *Use of fossil fuels*

27. The production of 1 kilocalorie (kcal)<sup>31</sup> of food energy obtained from intensively produced beef requires an input of 40 kcal of fossil fuel energy.<sup>32</sup> Similarly, it takes 14 kcal of fossil fuel energy to produce 1 kcal of food energy from intensively produced pig meat or liquid milk.<sup>33</sup> The production of plant-based food nearly always requires substantially less fossil fuel energy.<sup>34</sup>

#### *Detrimental environmental impact*

28. The FAO has stressed that “The livestock sector has such deep and wide ranging impacts that it should rank as one of the leading focuses for environmental policy”.<sup>35</sup>

29. The fertilisers used to grow feed crops contain high levels of nitrogen as does the concentrate feed supplied to industrially produced livestock. Nitrogen is essential to plant and animal growth but excessive concentrations in ecosystems act as damaging pollutants. A large part of the nitrogen that is applied to crops or eaten by animals in feed is not absorbed. Pigs absorb only around 20% and poultry about 34% of the nitrogen in their feed;<sup>36</sup> the rest is excreted into their manure.

30. This non-absorbed nitrogen is washed into rivers and lakes and leaches from the soil into ground water, contaminating sources of drinking water and damaging aquatic and wetland ecosystems. The FAO states that the livestock sector is probably the largest source of water pollution.<sup>37</sup>

#### *Healthy, nutritious diets*

31. The 2008 Cabinet Office report *Food Matters* stresses that “some meat and dairy products can be high in fat, particularly saturated fat. High levels of saturated fat in the diet can raise cholesterol levels and increase the risk of heart disease. Some studies have also linked higher consumption of red and processed meat to an increased risk of developing certain types of cancer.”

32. The health benefits of reduced meat consumption are stressed in a recent report by the World Cancer Research Fund.<sup>38</sup> The report concludes that red or processed meats are convincing or probable causes of some cancers and that diets with high levels of animal fats often increase the risk of weight gain. It adds that most diets that are protective against cancer are mainly made up from foods of plant origin.

<sup>26</sup> Warren R *et al.* *Understanding the regional impacts of climate change*. Paper prepared for the Stern Review. Tyndall Centre for Climate Change Research. September 2006. [http://www.tyndall.ac.uk/publications/working\\_papers/twp90.pdf](http://www.tyndall.ac.uk/publications/working_papers/twp90.pdf)

<sup>27</sup> Scientific Opinion of the Panel on Animal Health and Welfare, *The EFSA Journal* (2007).

<sup>28</sup> *Ibid.*

<sup>29</sup> *Ibid.*

<sup>30</sup> Hoekstra A. Y. and Chapagain A. K. Water footprints of nations: Water use by people as a function of their consumption pattern. *Water Resources Management* 21:35–48. 2007. DOI 10.1007/s11269-006-9039-x

<sup>31</sup> One kilocalorie equals 1 000 calories.

<sup>32</sup> Pimentel D *et al.* Reducing energy inputs in the US food system. *Human Ecology* 36:459–471. 2008. DOI 10.1007/s10745-008-9184-3

<sup>33</sup> *Ibid.*

<sup>34</sup> *Ibid.*

<sup>35</sup> Scientific Opinion of the Panel on Animal Health and Welfare, *The EFSA Journal* (2007).

<sup>36</sup> Van der Hoek K.W., 1998. Nitrogen efficiency in global animal production. *Environmental pollution*, 102:127–132.

<sup>37</sup> Scientific Opinion of the Panel on Animal Health and Welfare, *The EFSA Journal* (2007).

<sup>38</sup> Food, nutrition, physical activity and the prevention of cancer: a global perspective. World Cancer Research Fund. 2007.

33. The Cabinet Office report concludes: “Evidence on health and the balance of environmental analysis suggests that a healthy, low-impact diet would contain less meat and fewer dairy products than we typically eat today”.

34. Nutritional benefits would arise from a change from intensively produced chicken to birds reared free range. Research shows that intensively produced chickens contain more fat than protein whereas organic chickens have more protein than fat. Free range chickens are significantly less fatty than chickens reared indoors.<sup>39</sup>

#### *Impact of intensive livestock production on animal and human disease*

35. Intensive livestock production methods, where large numbers of animals are kept together in confined spaces, greatly increase the potential for infections to be spread between animals. Intensive farms provide pathogens with a large number of hosts in close proximity and conditions in which different strains of pathogen can co-infect one host and facilitate genetic mutation and recombination.<sup>40</sup>

36. A recent report by the FAO, *Industrial Livestock Production and Global Health Risks*, points out that industrial livestock production plays an important part in the emergence of highly pathogenic avian influenza and other diseases.<sup>41</sup> The US Council for Agriculture, Science and Technology has warned that a major consequence of modern industrial livestock production systems is that they potentially allow the rapid selection and amplification of pathogens.<sup>42</sup>

37. Intensively farmed animals are typically stressed—for example by overcrowding and lack of opportunity for natural behaviour—and therefore have weakened immune systems and are more susceptible to infections. Modern livestock intensively selected for high yield are more likely to suffer from ill-health than more robust traditional breeds.<sup>43</sup>

38. Antibiotics are used routinely in industrial farms to forestall the diseases that would otherwise be inevitable in the crowded conditions. Antibiotics are in effect being used as a substitute for good husbandry and hygiene. This irresponsible use of antibiotics in industrial farming has been a major factor leading to the emergence of bacteria that are resistant to some of the antibiotics used to treat serious human disease.<sup>44</sup>

#### *Food for the future*

39. It is clear that industrial livestock production is an inefficient way of feeding people. It uses excessive amounts of scarce natural resources of land, water and energy and is damaging to the environment. Attempting to feed the growing world population by increasing industrial livestock farming is not a realistic strategy as it will place the land, water and energy needed to support this approach under increasing pressure.

40. A much more judicious strategy, if we are to use these resources more sustainably, is to re-orient the world’s animal production away from industrial farming and towards lower-input, more extensive systems. This needs to be accompanied by a reduction in meat and dairy consumption in developed countries; this will lessen the need to produce increasing amounts of meat and milk and also help to prevent a rise in the GHG emissions produced by the livestock sector.

41. In the interests of global equity, and in order not to disadvantage people in poorer countries who currently eat very little meat, we support a strategy of “contraction and convergence”.<sup>8</sup> A reduction of meat consumption in rich countries would allow poorer countries to increase their consumption according to their dietary needs. Wealthy countries such as those of the EU should aim for a well-managed and government-supported reduction in the production and consumption of animal proteins and animal fats. This would mean that fewer animals would be reared but in more extensive conditions, using slower growing and hardy animals that require lower inputs of concentrate feed and energy.

January 2009

<sup>39</sup> Wang YQ, Thomas B, Ghebremeskel K and Crawford MA (2004) *Changes in Protein and Fat Balance of Some Primary Foods: Implications for Obesity*, Institute of Brain Chemistry and Human Nutrition, London Metropolitan University. Presented at the 6th Congress of the International Society for the Study of Fatty Acids and Lipids, 27 June-1 July 2004, Brighton.

<sup>40</sup> Pew Commission on Industrial Farm Animal Production. *Putting meat on the table: industrial farm animal production in America*. 2008. [http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Industrial\\_Agriculture/PCIFAP\\_FINAL.pdf](http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Industrial_Agriculture/PCIFAP_FINAL.pdf)

<sup>41</sup> Otte, J., D. Roland-Holst, R. Pfeiffer Soares-Magalhaes, Rushton, J., Graham, J., and Silbergeld, E. 2007. *Industrial Livestock Production and Global Health Risks*. Food and Agriculture Organization of the United Nations, Pro-Poor Livestock Policy Initiative Research Report.

<sup>42</sup> Council for Agriculture, Science and Technology. *Global Risks of Infectious Animal Diseases. Issue Paper 28*, February 2005; 15pp.

<sup>43</sup> Rauw W M *et al*. Undesirable side effects of selection for high production efficiency in farm animals: a review. *Livestock Production Science* 56: 15–33.1998.

<sup>44</sup> Shea K M. Antibiotic resistance: what is the impact of agricultural uses of antibiotics on children’s health? *Pediatrics* 112(1):253–258. 2003.



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**Memorandum submitted by The Woodland Trust (SFS 06)**
**EXECUTIVE SUMMARY**

1. The Woodland Trust supports the need for a thriving viable and sustainable agriculture industry in the UK, able to support national food security. Productive agriculture relies on a stable and thriving ecosystem to provide the services for planned agricultural production. Woodland and other natural habitats are vital in securing those services.

2. Despite the UK's self-sufficiency ratio having fallen in recent decades, it is our view that food security should not be simply increasing national food self sufficiency. In the medium to long term the greatest risks to food security in the UK are likely to result from issues around oil supply and climate change rather than other factors which have received disproportionate attention such as for example, land going out of agriculture to other uses.

3. A package of measures to address food security should consider:

- Identifying issues relating to energy supply, particularly oil.
- Mitigating and adapting to the impacts of climate change.
- Robust supply and distribution chains.
- Reducing food waste.
- Consideration of dietary change—particularly a switch from high meat and dairy diets.
- Where appropriate increasing food self-sufficiency.

4. Adapting to climate change will require resilient systems able to support a human population in additional ways to food production. This includes ensuring adequate and clean water, biodiverse systems able to support agriculture in the long term, timber and other forest commodities, cities with adequate shade, shelter and resilience against flooding, as well as cultural values associated with the natural environment, including woods and forests.

**SECURING FOOD SUPPLIES UP TO 2050: THE CHALLENGES FOR THE UK**

5. The Woodland Trust welcomes the opportunity to respond to this consultation. We are the UK's leading woodland conservation charity. We own over 1,000 sites across the UK, covering around 20,000 hectares (50,000 acres) and we have 300,000 members and supporters.

6. Our particular interest and concern relating to the terms of reference of this consultation is the way in which land is farmed and managed; achieving food security whilst ensuring sustainable production. In particular that any increase in domestic food production reflects an understanding of the importance to agriculture and to wider ecosystem services of a healthy and thriving natural environment.

7. The Intergovernmental Panel on Climate Change (IPCC) forecasts a decline in global food production.<sup>45</sup> Limiting factors include changing rainfall patterns, loss of water supply for irrigation, increased pest and pathogen outbreaks, greater fire risk and increasing levels of ground level ozone.

8. Greater frequency of extreme weather events such as storms, flooding and droughts are likely to increase the uncertainty of food production, and lead to years in which there is serious global undersupply.

9. Modern agriculture is dependent on oil, not just as a fuel source but in the production of pesticides and fertilisers, and in processing, packaging and distribution of food. Oil represents about 43% of the world's energy use, but dominates transport, with over 96% of transport fuel coming from oil.<sup>46</sup> Food security in the UK is strongly associated with issues around energy security, illustrated dramatically when supermarket food stocks began to run out after just one week of the fuel tanker driver strikes in 2000. In our view in the medium to long term the greatest risks to food security in the UK are likely to result from issues around oil supply and climate change rather than other factors which have received disproportionate attention such as for example, land going out of agriculture to other uses.

10. Waste in the food chain also has a major impact on both food security and greenhouse gas (GHG) emissions. The UK currently wastes a third of all food bought for home consumption.<sup>47</sup> Improved understanding of the impacts of waste through all parts of food production, processing, distribution and consumption, could increase food self-reliance and reduce GHG emissions.

11. Despite the UK's self-sufficiency ratio having fallen in recent decades to around 60%, it is our view that food security should not be thought of simply as increasing national food self sufficiency.<sup>48</sup> Food security encompasses a robust and responsive domestic food industry, reliable food imports, effective food distribution systems and consumer behaviour, particularly around waste, which reflects the value and importance of food.

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<sup>45</sup> [http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4\\_syr\\_spm.pdf](http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf)

<sup>46</sup> <http://www.worldwatch.org/node/4079>

<sup>47</sup> <http://www.telegraph.co.uk/money/main.jhtml?xml=/money/2008/07/08/ccfood108.xml>

<sup>48</sup> Defra (2006) Food security and the UK: an evidence and analysis paper.

12. A package of measures to address food security should consider:

- Identifying issues relating to energy supply, particularly oil.
- Mitigating and adapting to the impacts of climate change.
- Robust supply and distribution chains.
- Reducing food waste.
- Consideration of dietary change—particularly a switch from high meat and dairy diets.
- Where appropriate increasing food self-sufficiency.

13. The Woodland Trust supports the need for a thriving viable and sustainable agriculture industry in the UK which is able help deliver national food security. Food and agricultural commodities are an important part of a trading system of which we have a long history.

14. Productive agriculture relies on a stable and thriving ecosystem to provide the services for planned production—clean and plentiful water, pollinating insects and a balance between crop pests and their predators, healthy soils, clean air etc—and to provide the genetic resources for future development.

15. Food, whilst clearly immediately critical to life, is not the only element of a liveable environment. Adapting to climate change will require resilient systems able to support a human population. This includes ensuring adequate and clean water, biodiverse systems able to support agriculture in the long term, timber and other forest commodities, cities with adequate shade, shelter and resilience against flooding, as well as cultural values associated with the natural environment, including woods and forests.

16. Woodland and other natural habitats and resources should not be seen as luxuries to compete against the needs of food production in a battle over use of land but rather as essential and fundamental in securing ecosystem services which support food production.

17. This includes an increase in the area of woodland in the UK:

- As part of the development of habitat networks for biodiversity conservation.
- To help mitigate and adapt to climate change, in particular in water management.
- To adapt towns and cities to changing climate and weather patterns.
- To provide the resources we need, including the provision of timber and bioenergy where appropriate.

January 2009

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**Memorandum submitted by the Reverend John Oliver (SFS 07)**

*Response from Reverend John Oliver, Chaplain and Trustee of the Royal Agricultural Benevolent Institution and member of RABI's Welfare and Grants Committee*

I warmly welcome the Inquiry to be undertaken by the EFRA Select Committee into the challenges faced by the UK in securing food supplies up to 2050, and I am glad that this Inquiry arises at least in part out of last year's announcement by the United Nations Food and Agriculture Organisation that world food production will need to rise by 50% by 2030, and to double by 2050. I believe strongly that UK farming, including smaller family farms, must be enabled to play a leading part in this necessary increase in food production, bearing in mind the desirability of achieving a high degree of food security in the UK, and believing that this can be done without compromising good standards of environmental stewardship and of animal welfare.

I am mindful of some thinking within Defra which envisages a reduction in food output from UK farms as a consequence of the phasing out of the Single Farm Payment (SFP), and I want to emphasize the vital importance for the future of UK (and European) farming of continuing some degree of Pillar 1 financial support (whatever precise form this may take) in the light of likely world market food prices. Estimates of the prospects for UK farming in 2009 (for example in *Farmers' Guardian* on 2 February 2009) underline the continuing dependence of most UK farming sectors on the SFP to bridge the production cost gap, and there is no reason to suppose that this will not continue to be the case in future. I hope that the EFRA Select Committee will give close attention to the necessity to continue to provide some form of substantial financial support for UK farming, recognizing that such support will have to continue to be linked to cross-compliance conditions as at present; indeed, such conditions will be of particular importance as production is increased, if there is not to be a return to some of the damaging environmental consequences of the early years of the CAP.

I also hope that the EFRA Select Committee will at least consider the desirability, in order to maintain stable and rising levels of food production, in recommending the re-introduction of some form of intervention price for primary products, to counteract increasingly unstable and volatile world market prices, and to guard against the unpredictable effects of climate change. My work for RABI, which involves scrutinising the accounts of working farmers who need to apply for help from RABI, has made me realise

how desperately narrow are the financial margins of many smaller farmers, and how critical any change in their cash flow is, through for example livestock movement restrictions or any abnormal disturbance in market conditions.

In response to some of the specific questions of the Inquiry announcement document, I am absolutely certain that it is vital to maintain a good skills base for UK farming, and I hope that the Select Committee will recognize the contribution of family farms in nurturing the next generation of dedicated and enthusiastic young farmers. The science base of UK agriculture has been neglected in recent years, and government investment must increase in this area.

Local food networks have grown in importance in recent years, and should be actively encouraged.

It is sad that support for UK farming from Defra has been less enthusiastic and whole-hearted than it should have been, and there is no doubt that many UK farmers look with some degree of envy to other European governments who support their farming industries and communities more generously and consistently, as well as valuing more highly the specific contributions made by smaller farms to the quality and variety of rural life. It would be excellent if the UK government were to offer similar levels of help and encouragement, so that UK farmers can compete on equal terms with their EU colleagues.

January 2009

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**Memorandum submitted by the British Association for  
Shooting and Conservation (BASC) (SFS 08)**

BRITISH ASSOCIATION FOR SHOOTING AND CONSERVATION

BASC was founded in 1908 as the Wildfowlers Association of Great Britain and Ireland and is constituted as an Industrial and Provident Society (IPS) with a membership in excess of 130,000, and it is also the largest representative body for sporting shooting in the UK.

BASC actively promotes good firearms licensing practice, training, education, research and practical help with conservation.

BASC aims to promote and protect sporting shooting and the wellbeing of the countryside throughout the UK and overseas, and believes that all who shoot should conduct themselves according to the high standards of safety, sportsmanship and courtesy with full respect for the quarry and a practical interest in wildlife conservation.

BASC expertise in shooting matters is widely recognised and it is routinely consulted by a variety of government departments and statutory and non-statutory bodies.

COMMENTS

We note in particular the section of the Inquiry regarding “What are likely to emerge on the demand side of the food system in the UK, in terms of consumer tastes and habits and tastes, and what will be their main effect?” What use could be made of local food networks?

BASC would make the following specific points with regard to this section:

- The market for game and exotic meat has been buoyant over the last two years achieving total sales of £61 million in 2006, roughly 50% higher than sales in 2004 when Mintel last reported on this market (*Data source: Mintel 2007*).
- Game meat accounts for 93% of total market sales. Venison and pheasant have been the main meats with growing consumption. Much of the recent growth in the game market has been chiefly the result of improved distribution for game meat, especially in supermarkets. There still remains the opportunity to improve distribution, partly to increase the number of stores in each supermarket outlet that retails game, but more significantly by increasing the shelf space that is currently allocated to game meat. This will probably be achieved by a wide ranging programme of new product development by the retailers and investment by them in high profile promotion and marketing.
- Game meat is a tasty alternative to poultry as it is low in fat and high in minerals. These attributes fit well as consumers search for new meats that will benefit their health. As game meat is both healthy and tasty it appeals as a welcome alternative to traditional meats.
- BASC has promoted game meat as a local, nutritious healthy and free range food source, harvested from a sustainable surplus by game shoots across the country, since the mid 1960s.
- BASC’s game marketing initiative, Game’s On was launched in 2005 and since then has created a first class web portal and distributed over 150,000 high quality recipe leaflets through a network of game fairs, game tasting events and through game dealers and their customers.

- The sales of game doubled between 2004 and 2006. Sales for game meat such as venison, pheasant and grouse soared 46% during that time to reach £57 million by the end of 2006. The increase in sales of everyday red meat and poultry grew by only 5% in comparison (*Data source: Mintel, February 2007*).
- The popularity of game shows no sign of abating with sales set to rise by a further 47% to hit over £84 million by 2011 (*Data source: Mintel, February 2007*). Game meat is particularly popular as it can reduce considerably food miles as the majority of consumers of game meat are located in areas local to shooting activity.
- Growth in the market for game meat will increasingly rely on moving consumers' perceptions of these meats from being suitable only for special-occasion use to meats consumed on a regular, if infrequent, basis.
- The market for game meat is supply-led rather than demand-driven. The seasonal supply of game as a result of the shooting seasons could be an obstacle for the development of the game meat market, although game can now be sold all the year round, as long as it has been legally shot.
- The game meat market is currently relying almost entirely on PR, point of sale promotional materials and game tasting events, organised by the BASC Game's On campaign and others.
- The committee inquiry should consider how best to increase the consumer taste for game meat as a local, nutritious and healthy food source, and that restaurant and pubs, farmers' markets, game processors and butchers should be used more effectively as local food networks promoting the benefits of game meat consumption and at the same time working towards reducing food miles.

British Association for Shooting and Conservation

January 2009

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### Memorandum submitted by Northern Foods plc (SFS 09)

#### EXECUTIVE SUMMARY:

The responses from Northern Foods plc assume that the UK, a population dense country, will remain to 2030 and 2050 an importing country for certain food commodities long accepted in an established trading nation as part of a mixed, balanced, general UK diet. The additional challenges perceived as arising are largely the result of climate change, including but not limited to:

- New crop hazards and pests prompting change in agricultural practice.
- The adoption of crops to changing, less predictable weather conditions.
- Population environmental migration, predominantly from Africa.

The potential solutions are perceived in the development and application of science; in the development of infrastructure responsive to changing requirements; and in the extension of training and education.

#### RESPONSES:

Specific responses to the questions posed are under-noted.

#### 1. *How robust is the current UK food system? What are its main strengths and weaknesses?*

The UK food system has been characterised for many years by improving yields for primary produce, by advanced food manufacturing and logistics practices minimising waste and by a sophisticated supply chain meeting consumer expectations for quality, safety and convenience. Various studies conducted for different reasons have demonstrated both the robustness and the responsiveness of the system.

The UK is a long established trading nation for many food commodities and is likely to continue to fulfil some of its needs via importation of food until 2050 and beyond. The increasingly unpredictable effects of weather, coupled with the expected growing demand for food, will impact on availability, thus cost, and may if unchecked promote protectionist practices.

2. *How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

The UK is potentially in an advantageous position, in an increasingly global economy, with the knowledge and expertise long deployed to help other countries improve both production and preservation practices. For example, India is the leading producer of fruit and vegetables yet 40% of produce currently grown fails to reach the consumer because of a lack of preservation and distribution infrastructure. UK expertise can be employed far beyond national boundaries to help develop local solutions to global problems.

3. *In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

3.1 *Soil quality:* Without intervention, soil erosion and nitrification may be expected. Care should be exercised to ensure the work of other agencies does not encourage the un-composted return of materials to the soil, with further unintended environmental and food chain consequences.

3.2 *Water availability:* Even at present, in one third of England and Wales, water cannot be abstracted throughout the year. There is a need to address the challenges of water harvest technologies and distribution within the UK.

3.3 *The marine environment:* Best available wild species conservation techniques should be employed to protect the marine environment, in conjunction with a drive, wherever possible, to replace hunted species with farmed, sustainable, aquaculture alternatives.

3.4 *The science base:* There is a key challenge in encouraging generally the study of the sciences and in improving specifically the attractiveness of the range of agriculture and food related sciences to new generations of potential students.

3.5 *The provision of training:* Problem solving requires the deployment of knowledge, skills and talent. Increases in incentives to improve training can only be welcomed.

3.6 *Trade barriers:* Recognising the sensitivities in consumer health risk assessment, care should be exercised to avoid the precautionary principle allowing the building of unnecessary technical and commercial barriers to trade. The removal of inappropriate standards should be encouraged, wherever possible, to free trade.

3.7 *The way in which land is farmed and managed:* Challenges arise in understanding true agricultural best, sustainable, practice; in communicating with a disengaged, often mistrustful consumer base; in re-determining land availability for crops use; and in adaptability to mitigate the effects of climate change.

4. *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

The UK consumer has become accustomed to convenience, wide variety, wide choice and 24/7 availability in their selection of foods; fundamental demand expectations are unlikely to change in the foreseeable future. Increasing understanding of a requirement for environmental resource efficiency may affect food selections made but the continuing uncertainties as to the relative values of local food sourcing and fossil carbon efficient food sourcing strategies render in effect prediction uncertainties.

5. *What role should DEFRA play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should DEFRA provide to the food industry?*

The key role is in the delivery, support and application of sound science to aid sustainable decision making throughout the food supply chain. Means of addressing consumer mistrust of scientific solutions should be actively considered.

6. *How well does DEFRA engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a current cross-Government food strategy?*

Value judgements can be difficult to make in absolute terms. It may be beneficial to question whether cross-Government food strategy is understood in the sector and by the end consumer.

7. *What criteria should DEFRA use to monitor how well the UK is doing in responding to the challenge of doubling food production by 2050 while ensuring that such production is sustainable?*

Primary agricultural and finished food outputs, expressed as some form of tonnage to fossil carbon ratios, may be appropriate criteria for monitoring purposes. This will require the development of appropriate, practicable, carbon calculation tools.

Northern Foods plc

January 2009

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**Memorandum submitted by Anthony Jackson (SFS 10)**

Firstly I would like to draw your attention to Devolution, and the separate progressive policies and directions that the Devolved administrations are taking vis a vis food and farming. Perhaps Westminster could start to learn from and follow some of the fine examples set around food and farming in Scotland and Wales.

**FOOD STOCKS**

About time that they were brought back into being, they would have mitigated most of the present “food crisis”.

**MARKET POWER**

The distortions in relative market power along the food chain, both domestically and internationally need to be rapidly and seriously addressed.

This not only involves the retailer/producer relationship, but also the suppliers of inputs (especially chemical and seeds and fertilisers)/producer relationship. Strong concentration has occurred in the seed, chemical and fertiliser sectors, some due to GM seeds and patenting, this is impacting negatively for farmers and diversity of crops, across the UK and across the globe. Patenting and monopoly power need to be addressed.

**WASTE AND CONSUMPTION**

30% of food is wasted in the UK! This is appalling. It contributes to environmental damage, and the need to import crops from abroad including, for example, soya from deforested areas of South America. Reducing food waste to the minimum possible level must be the most serious priority.

Two billion people globally are obese, whilst 850 million are starving.

This is clearly perverse, and needs to be prioritised. Instead of spending vast amounts of money on failed technologies (such as GM) to try and increase yields, and instead of similar attempts to do the same via further intensification and concentration, the direct link must be made confidently and publicly that overconsumption is a primary cause of malnutrition in the world. This can then allow genuine attempts to redistribute food effectively.

**PRODUCTION**

There is a vital need to address the issue of access to the means of production, both in the UK and globally. To feed themselves, and to feed themselves quality food of their own choosing, people need access to the means of production necessary to produce food. This includes seeds, water, and land. It also requires that farmers and the public have a far greater say in “food policy”, rather than just via consultations or as consumers.

**BIOFUELS AND ANIMAL FEED**

Biofuels are a waste of time, effort and money. They are based on a completely ridiculous predication, and will only lead to further squandering of public money, and a bubble bursting, further damaging hard pressed farmers.

The UK imports a huge amount of animal feed. Surely it makes far more sense to grow our own animal feed, and extensify production systems (including strongly encouraging mixed farming), than pushing on the runaway biofuel bandwagon.

## GM CROPS

It is still amazing that after a quarter of a century of failure some people still seem to need to peddle the nonsense that GM crops can play any part in solving any of the problems that we have concerning food and farming.

GM crops exist because they can be patented and hence monopoly profits can flow to the MNCs (Multinational Corporations) that can afford the research and development costs (which are also heavily subsidised via public institution research budgets).

There is simply nothing else to it.

Only 2% of the World's agricultural land is under GM crops. GM crops go into animal feed, fibre and now fuel (biofuels), all areas where consumers find it hard to make a direct choice. Despite the protestations of the vested interests in the GM industry, very few GM crops go directly into human food, and only then in highly processed form, in small quantities, and in unlabelled products in the USA. If the GM industry had enough confidence in its products to actually label them in the USA, these products would be rejected too.

The "potential" of GM, other than to suck up vast amounts of scarce research funding that would be far better allocated elsewhere, has long been noted to be nothing more than simplistic and juvenile attempts to ignore the real fundamental issues, and subscribe to industrial silver bullets.

## NANOTECHNOLOGY

Another wild goose chase...

## FURTHER

Distribution of food needs to be improved across the UK and globally.

This requires relative levels of poverty to be addressed, as well as issues of geography. Where there is a need, incentives for the local production of certain products will be necessary. This will also help to reduce food miles.

Trade issues need to be looked at with honesty. Fair Trade does a great job, but is marginal. Public monies spent on fairly traded foodstuffs must dramatically increase. We must also be aware that other countries need to be able to produce food for their own consumption, and some incentives and pressure from richer nations actually act against this primary necessity.

Food security and Food Sovereignty are key issues and are interlinked. Why do we import so much animal feed? Is it really in our best interests to have our meat sectors in hock to soya produced on the other side of the world. Should we really be supporting the production of GM varieties of maize and soya that destroy environments in South America, and increase pesticide usage across all of the Americas, by not working out how to feed our livestock with more locally produced feed?

Funding can be directed to research in how much protein is really necessary.

What advantages there may be by increasing the usage of pasture and straw. What protein crops can be grown across the UK and the EU? And of course, why can we not reduce some of the problems of food waste, by returning to the use of pig swill. How many problems could that solve?

There may be a need to extensify, but that brings environmental, welfare and branding benefits too.

The environment needs protecting and enhancing. This includes water and soil, and again should make us look at the amount of pesticides and fertilisers that we actually do need. It also means that we should stay well clear of GM crops. The environment outwith the UK is also important. The food that we import impacts negatively on other countries environments. GM, pesticides, deforestation are all key issues. Soya, and other feed crops are again key, but so are other food stuffs, and so, of course are the issues associated with food miles and global change.

Social impacts of production should never be ignored. The use of chain gangs in the UK needs to be addressed immediately. The conditions that some people have to work in are completely unacceptable. Social issues abroad should also not be ignored. Plantation agriculture has many problems, and we import many foods grown in such systems. We cannot indirectly support slavery.

Land grabs are also widespread. Soya cultivation in South America is not only leading to the destruction of unique and vital habitats, but also the ejection of many native peoples and campesinos from their land. Extensification and increased self sufficiency at home, will not only lead to a better control over our own food production, isolate us from the worst effects of the global food chain, and associated speculation, but also help smallholders abroad maintain their way of life, and the ability to feed them-selves.

It is probably also time to recognise that if we do want a fair agricultural system, and thriving rural areas, more money needs to flow into the countryside. Although this may be a tricky time to talk about this, it may be necessary that people have to pay more money for food. The proportion of incomes spent on food is at an all time low, and this is reflected in our production methods, environmental degradation, health issues,

and concerns in rural areas. In return for an increasing proportion of private and public incomes spent on food, we must demand, and get, on the other side of the bargain, quality, healthy food, that benefits the environment, not only in the UK, but across the world.

With this quality production comes the ability to brand our food so that the benefits can be easily read by the consumer who is being asked to pay more to increase the margin for the producer. Locality is of course important in this, as can be methods of production. Feed is also key here for animal products, for example, as is happening across Europe, meat and dairy products can be labelled as fed on GM free food. The UK can steal a march here and create the conditions for honesty and marketability, and profitability.

These profits must be distributed fairly. This needs a major rebalancing of power throughout the chain (and globally!). Producers need their fair share, and processors and large retailers need to be held accountable so this becomes a reality, and not just an aspiration. Small retailers also need a fair go.

We all know how it can be done, and that it can be done. It just needs the will to make it happen. This will not only need the will of politicians, but also consumers, and the producers themselves, to change their behaviour.

Vested interests, whether they are the multinational GM seed producers, or the domineering supermarkets, cannot be allowed to hold the food system to ransom. Food is for us all, and not just the few.

Education is vital in all of this. People need to understand food, appreciate food, and agriculture and the environment. Nutrition, cooking skills, and even the ability to grow their own food, must be encouraged.

This obviously has a place in schools, but we must also inspire, and facilitate the adult population of the UK as well.

Communities, including in urban areas, can be incentivised to grow their own food, and hence re connect to what they eat every day.

Procurement has been oft mentioned, and understandably so. School canteens, prisons, the health sector, councils and central Government can collectively and positively change the face of UK agriculture and UK food. In the same way as consumers are entitled to local, quality, labelled and fully traceable food, so are children and employees.

And education is a life-long process.

Finally, do we really need to double food production by some future date? This “fact” has never really been questioned, and yet extrapolations of this kind (and of population) tend to be wide of the mark? Maybe there are better ways to feed all of us fairly: distribution; balanced, healthy diets; addressing poverty, etc, etc.

And; should we be so distracted by what may or may not happen in 40 years time, when we should be fundamentally changing things now, so that we can feed the 1 billion people who will starve this year. They should not be forgotten, and should be at the heart of your enquiry, rather than putting off the necessary changes to face the potential problems of the future.

If we had the courage to deal with the problems of today, we may also find that we have dealt with the problems of tomorrow.

## OVERVIEW

There are no short cuts and no technological fixes to any of the food and farming issues that we face in the UK and globally.

For too long Government has encouraged (and funded) greed and stupidity.

We now must spend more time and effort concentrating on quality, respect throughout the food chain, and a fundamental rebalancing of power relationships, both within the UK and globally.

We need to reconnect people with food, and an appreciation of food. Where it comes from and what it takes to produce. People need to know how to cook, and how to cook well, how to eat well, and how to live well. And people need to know how what they consume, and how they act impacts on the poorest in the world, and have the courage to change.

*Anthony Jackson*

*January 2009*

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## Memorandum submitted by the Marine Conservation Society (SFS 11)

Fish are not only a vital part of the marine ecosystem but also a healthy source of protein providing essential fatty acids, vitamins and minerals for billions of people. Globally, fisheries supply over 2.6 billion people with at least 20% of their average protein intake. Currently the UK is not well placed to respond to the anticipated challenges of increasing global seafood production of 50% by 2030, or doubling it by 2050, whilst ensuring production is sustainable. Around the British Isles only eight out of 47 fish stocks are known to be in a healthy state, and thus the UK faces a serious challenge to secure food supplies sustainably from



the marine environment. Overfishing, discarding, single species management, lack of the precautionary principle, underreported fishing, and the pressures from aquaculture feed supply all threaten the future sustainability of our fisheries. Defra has a fundamental role to play in addressing the weaknesses that have resulted in the current poor health of our marine food resources. It is vital that through increase research, development, and monitoring of our fisheries as well as advocacy and engagement with European and International bodies on fisheries policy, Defra ensures that the exploitation of our marine fisheries is sustainable.

### *The importance of seafood*

1. Globally, fisheries supply over 2.6 billion people with at least 20% of their average protein intake.<sup>49</sup> In addition, seafood provides essential fatty acids, vitamins and minerals, which are integral to a health diet.

2. In order to maintain current levels of fish consumption for an expanding world population, the Food and Agriculture Organisation (FAO) predict an additional 37 million tonnes of fish per year will be needed by 2030.<sup>50</sup>

3. The Food Standards Agency recommends we consume at least two portions (140g) of fish a week, one of which should be an oily fish. However at present, current consumption is well below these guidelines (63g/person oily fish consumed per week, 115g/person white fish consumed per week<sup>51</sup>); consequently, UK consumption of fish would need to double to meet the agency's advice. This equates to an extra 33 million portions of oily fish a week alone based on the current population;<sup>52</sup> with the expected population increase in the next 20–40 years, we can anticipate an even greater demand for seafood in the future.

4. Although the UK is one of the main capture fisheries producers in the EU, most of our seafood is imported (560,700 tonnes in 2002<sup>53</sup>), therefore it is vital that the UK engage with European and international bodies, on fisheries and food policy to ensure food security for 2050.

### *Do we have enough fish?*

5. Over 70% of the world's fish species are either fully exploited or depleted; in the EU 88% of stocks are overfished, compared with 25% on average globally,<sup>54</sup> and around the British Isles only eight out of 47 stocks are known to be in a healthy state.<sup>55</sup> The current state of our fish stocks simply cannot meet an increasing demand.

6. The UK's own independent government department the Food Standards Agency is having to reviewing its advice on fish consumption to take into account sustainability issues due to the mismatch between how much fish we should be consuming and how much fish is actually available due to declining fish stocks.

7. Overfishing is widely acknowledged as the greatest single threat to marine wildlife and habitats, but now it threatens our food security. The biomass of cod in the North Sea has fallen from 250,000 tonnes in 1970 to just 37,000 tons in 2007.<sup>56</sup> Species such as common skate, angel sharks, Atlantic halibut, which were once common in the North Sea, are now considered to be critically endangered.

8. As well as the problem of overfishing, the issue of by-catch and discards is significantly threatening the health of our fish stocks and the marine environment. These are fish and other organisms that are caught accidentally in fishing gear and are thrown back in the sea. For example major demersal trawl fisheries in the EU are estimated to discard 70–90% of catch in number, which is an unacceptable waste of societal resources. Discards also affect the long term future of a fishery- the mortality of mature adults reduces the number of fish able to support future productivity, and the discarding of juveniles reduces the future catch opportunities as well as future yield. The estimate cost, in terms of future catch, of discarding unwanted fish in the UK is over 40% of the total annual value of the fishery.<sup>57</sup>

9. Poor management is in part to blame for the decline in our fisheries and consequent reduction in future food security: As part of the Common Fisheries Policy, "Total Allowable Catch" (TAC) for each commercial species is set, to protect our fisheries from this over-exploitation, however these TAC's are often set 30% higher than levels recommended by the scientists<sup>58</sup> which compromises the long term security and sustainability of supply.

<sup>49</sup> The state of the Worlds Fisheries and aquaculture 2004. Food and Agriculture Organization 2004. ISBN 92-5-105177-1.

<sup>50</sup> The role of aquaculture in sustainable development Thirty-fourth session, Rome, 17–24 November 2007. Food and Agriculture Organization. C/2007/INF/16.

<sup>51</sup> Food Standards Agency public written consultation. 6th January 2009. NUA 16/234

<sup>52</sup> Twenty-fifth report of the Royal Commission on the Environmental Pollution "turning the Tide" 2004.

<sup>53</sup> Seafish Industry Authority: <http://www.seafish.org/land/chain.asp?p=fb204>

<sup>54</sup> European Commission: policy statement proposes major changes in fisheries management regimes for 2009.

<sup>55</sup> Defra (2008) UK Biodiversity Indicators: sustainable fisheries.

<sup>56</sup> ICES (2007) species advice for cod in Subarea IV (North Sea), Division VIII (Eastern Channel) and Division IIIa (Skagerrak)

<sup>57</sup> Covery. R & Laffoley D.d'A (2002) Maritime State of Nature Report for England: getting on to an even keel. Peterborough, English Nature.

<sup>58</sup> Twenty-fifth report of the Royal Commission on the Environmental Pollution "turning the Tide" 2004.

10. Illegal, Unregulated Unreported (IUU) fishing also threatens the sustainability of our fisheries. Poor compliance to regulatory controls simply undermines the purpose of these measures: to protect the future of our fisheries. For example, misreporting catches may appear beneficial to the individual in the short-term, via economic gains (by landing more of a species than is permitted), however this threatens long term yields because it reduces the accuracy of stock assessments which monitor the health of our fisheries and are used in the management of this resource.

#### *The role of aquaculture*

11. Aquaculture is and will be relied upon to fill the seafood gap between supply and demand; currently aquaculture supplies 43% of global seafood, a figure expected to rise to 50% within the next 10 years.<sup>59</sup> Aquaculture is the fastest growing food producing sector, growing on average 8.8% per annum since 1970, compared to 1.2% for capture fisheries and 2.8% for terrestrial farmed meat. Declines in wild capture fisheries resources, economics and the increasing demand for seafood has encouraged the aquaculture sector to expand, but there are a number of issues, predominantly the increased demand placed on wild capture fisheries as a protein source for aquaculture feed, which threaten its future sustainability.

12. Two of the top five seafood species we eat in the UK are farmed—salmon and warm water prawn, both of these species are carnivorous and rely on wild capture fisheries to provide their food. Current food conversion ratios for both of these species illustrates that their production results in a net loss of ocean biomass. It is therefore essential that the species used to make fish feed are sustainability managed and the precautionary principle be applied to these many non-assessed, and poorly understood fisheries.

13. This supply of fishmeal and fish oil needs to be substituted with alternative protein sources to allow the aquaculture industry to expand to meet this growing demand. Protein sources such as porcine blood meal, vegetable protein and ragworm should be used, as should alternative oil sources such as linseed and other vegetable oils. Support and encouragement should be given to fish farmers that diversify into farming omnivorous and herbivorous species such as tilapia and catfish that do not rely on wild caught fisheries.

#### *The solutions*

14. Although the sustainability of our fisheries is a global issue, the UK has an integral role to play in protecting the future security and sustainability of this resource. Consequently Defra has an imperative responsibility to address the weaknesses that have been identified above.

15. The Marine Conservation Society firmly believes in the need for effective implementation of ecosystem-based fisheries management under developing UK marine legislation, the reformed Common Fisheries Policy and all other relevant International and regional fisheries management organisations. The ecosystem-based approach considers the affect of fishing on biodiversity, habitat structure, endangered species and water quality as well as fish stocks. The overall aim is to maintain healthy ecosystems and the fisheries they support. All management decisions should be based upon the precautionary principle, whereby measures are designed to take account of uncertainty in scientific advice and the likelihood of whether or not an activity may cause significant harm to the environment.

16. A greater shift away from current quota-based methods of fisheries management and towards effort-based schemes is needed (e.g. restrictions on licences, days at sea, fishing gear types and size, engine power etc), particularly for mixed species demersal fisheries. Quota based fisheries management has clearly failed to adequately deal with the complexity of mixed species fisheries in Europe, and inherent uncertainties in fisheries science and stock assessment. Total allowable catches will still need to be set, but only as a safeguard against unforeseen increases in fishing efficiency. All management measures should be designed to restore/maintain the spawning stock biomass of commercial fish species above precautionary limits. Strong UK representation and engagement at the European Fisheries Council, which puts scientific advice before political pressure, will help to ensure that TAC's are better aligned with scientific recommendations, and thus help to recover and protect our commercial fish stocks.

17. A number of technical conservation measures need to be applied at European level to conserve our threatened fisheries, and through advocacy and engagement with our European partners, the UK can ensure they are executed. However the UK can lead the way through legislation and by encouraging voluntary measures; increased development and more extensive and/or mandatory use of selective and environmentally sensitive fishing gear and practices would significantly aid the recovery of our most threatened stocks. This includes legislating for net mesh sizes that adequately reflect the size of maturity of all species being targeted (allowing individuals to breed at least once), especially in mixed whitefish fisheries. Increased and more widespread use of spatial/temporal closures to protect biologically important areas such as spawning and nursery grounds and essential fish habitat, and to help restore/maintain stocks above precautionary limits. Greater use of total seasonal closures for specific fisheries should also be encouraged

<sup>59</sup> Status and important recent events concerning international trade in fishery products. Committee on fisheries sub-committee on fish trade, eleventh session, Bremen Germany, 2–6 June 2008.

to protect species during key spawning periods. Spatial closures and gear restrictions can also offer conservation benefits through helping to reduce physical impacts on sensitive/vulnerable marine communities and habitats

18. Progressive changes in fisheries legislation that moves towards a ban on the discarding of commercial species of fish and shellfish are required to ensure the future of our fisheries resources. This should discourage selective grading of catches towards high value species/individuals, incentivise the development of more selective fishing methods and gear, and reduce uncertainty in fisheries data and stock assessments.

19. Defra has a responsibility to effectively monitor, maintain and recover depleted fish stocks surrounding the UK, but with just eighth of the 47 known stocks around the British Isles being in a healthy state, much more needs to be done. Monitoring of commercially exploited species around the UK is seriously lacking, with 47% of the stocks in an “unknown” state. In addition, there are a number of fish and shellfish species, which are not monitored because they are not “pressure-stocks”, yet they could be, at sustainable levels, able to contribute to our future seafood demand.

20. Many of these under-utilised species, the Marine Conservation Society recommends to consumers to help alleviate the pressure of the well-known stocks, which are currently in a poor state. Often these species are cheaper than the usual fish consumed, and this is important, as affordability is just as important an aspect of food access as food availability. Consequently more resources need to be applied to effective assessment and monitoring of the health of all fish stocks (pressure and non-pressure) around the British Isles, to ensure the sustainability of our fisheries, alternative seafood sources for the future and thus the security of our seafood supplies by 2050.

21. With regards to aquaculture, it is essential that the species used to make fish feed are fully assessed, sustainability managed and the precautionary principle be applied to the poorly understood, data deficient fisheries. Defra has a role to play in encouraging the supply of fishmeal and fish oil be augmented with sustainable alternative protein sources thus allowing the aquaculture industry to expand to meet this growing demand.

January 2009

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#### **Memorandum submitted by Richard Bruce (SFS 12)**

*How robust is the current UK food system? What are its main strengths and weaknesses?*

1. The rise in world food prices is a direct result of the influence of the financial markets and the attempts to persuade the public to accept GM foods. Political, not agricultural, pressures cause starvation in all parts of the world. Even in drought stricken areas food could easily be available if the political will existed.

2. Less than a decade ago “experts” and politicians were telling farmers in the UK that they did not need to produce food because it could be imported more cheaply. Thousands of farmers were forced out of the industry, taking their long-learned skills with them. Those who voiced concerns at this folly were ridiculed.

3. Now those same “experts” predict food shortages if the UK does not embrace even the most dangerous pesticides and GM crops. Such plans are unsustainable in a world where fuel resources are limited. Vital biodiversity is damaged by chemical use and the failure to ensure that seed development and supply is independent of the chemical industry, which itself has a vested interest in breeding varieties that are dependent on chemical inputs.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

4. The UK is in a very vulnerable position when it comes to security of the food supply. Agriculture has taken second place to all other considerations. “Environmental protection” and the building of new towns on prime agricultural land has been given more importance than feeding our people but this madness has been compounded by the encouragement of immigration to these already over-crowded islands. Population density is the key to sustainability of the food supply in any nation—and this has always been the case, even in nature. The food supply determines the size of the healthy population—not the other way around, as is always assumed for humans. There will be no long-term solution to the problem of a sustainable food supply until these matters are properly addressed. Any other fix will be temporary and unsustainable, especially in a world with finite resources.

5. Forcing food production to rise to meet the needs of a burgeoning population is no solution and will create bigger problems for future generations which may not have the resources or the opportunities to fix the problem. In decades past the UK could offset its requirement to import food by exporting its products from the industrial sector, which itself supplied the agricultural industry with its requirements for machinery. The industrial sector was destroyed in the 1980s and now UK agriculture imports most of its machinery, adding to the balance of payments deficit.

6. All plants and livestock have maintenance and growth requirements of minerals, vitamins, energy, proteins and fibre, water, etc., which cannot be supplied from a chemistry set in the exact requirements necessary to maintain health in the long-term. That is why the claims for genetically engineering of plants are over-optimistic since no plant can survive without the necessary nutrients. Even if there is a “drought-resistant gene” or an ability to increase the oil or vitamin content, the chemicals required to sustain that growth have to be supplied from somewhere.

7. For centuries mankind has been able to feed himself and his animals and still maintain the health of his soils. Livestock and permanent grassland had a vital role in providing our generation with the fertile soils and biodiversity that have sustained us all. Monoculture, heavy equipment, and chemicals that poison target and non-target organisms alike, are now systematically destroying that legacy.

8. It is time to regain that natural balance that is essential for our survival. The UK will always depend on food supplies from abroad. Some of those foods cannot be grown here at all. No matter how much production is increased that will never change. The UK should specialise in the traditional grass rotation crops and vegetables, grown successfully for centuries. These crops are best grown on smaller units where much more care is taken as regards soil type and crop growth than is possible on the large estates where most of the cereals are grown. Commercial pressures put those very smaller units at a considerable disadvantage both in the cost of production and the availability of suitable equipment, stock, seeds, chemicals, and labour. The big players call the shots and the small units are sacrificed.

9. Britain had its own system of subsidy that was developed over centuries to ensure that we could feed ourselves as a nation. In abandoning that success when the UK joined the EU our agriculture joined a system where there was over production and was locked into a system in which our production had to be cut to meet the requirements of the EU even though the UK has always been a net importer of food. From that moment the UK will never again be able to work towards security of its food supply unless it encourages the vital contribution of small-scale producers.

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

#### *Soil quality*

10. As mentioned above the increasing size of holdings and the equipment used on them is inevitably leading to greater field size; the inability to treat areas of fields according to soil structure requirements; soil erosion resulting from the changing drainage patterns and lack of natural barriers and ditches; and the compaction of the soil, with loss of soil structure and biodiversity within the soils.

11. Environmentalists are now blaming farmers for flooding, supposedly caused by draining the land, but draining the land allows it to absorb water when it rains. Waterlogged land, concrete, roofs, and tarmac direct the rainfall immediately to the streams and rivers and to the flood plains further downstream. This serious factor does not appear to be accounted for in the planning process but has a direct effect on the soils and the sediments carried to the rivers and seas, taking pollutants with them.

12. Fertile soil is probably the most important of the legacies left to us by past generations and yet we are in danger of damaging it so much that future generations will not be able to grow the food they require in order to sustain their population.

#### *Water availability*

13. It is said that water will be the cause of future wars and yet we waste so much of what we have and we are polluting the sources with residues of pharmaceuticals, pesticides, and industrial pollutants. Much of the water is wasted simply because our age-old systems combine clean rainwater with sewage waste. The contaminated water then has to be cleaned and filtered so that it can be used again but our entire system is designed to waste good clean water, not only because the rain water is diverted straight into the rivers but also because so much ground water is used to top up the depleted sources in rivers because the rain does not reach the aquifers.

14. Having wasted water it is then suggested that we employ desalination plants which themselves will be dependent on energy resources that will be in ever more limited supply.

#### *The marine environment*

15. Pollutants from the land inevitably find their way to the seas. The land has been dosed with pesticides and industrial pollutants, and sewage, with its heavy metals and washing chemicals with their persistent perfumes etc., have been disposed of at sea for a very long time. Creatures living in the oceans are now contaminated with chemicals such as mercury and other pesticides. How long will it be before the fluoride now added to drinking water will be found in marine life?

16. We cannot sustain the way we are living unless we take more care of the wider environment. Fish are killed then thrown back into the oceans but fish stocks are dangerously low. It is illogical.

*The science base*

17. A new definition of “science” is required. Currently the power of vested interests over the publicised science has corrupted the very term itself. Frequently there are peer-reviewed reports in the scientific press that directly oppose one another. While it is true that science is not static and that it is constantly evolving the principles of science have never changed but proof of theories has largely been abandoned and in its place theory has become accepted fact until it can be disproved. That is not science but theoretical pseudo-science and it is dangerously unreliable, especially when theories suggesting great advances if a technology is accepted are claimed to be science that “proves” that such advances will be made. A theory cannot be established science until its proof is written up and other, independent, scientists can substantiate the experimental evidence.

18. The science base and the knowledge base upon which we all depend have been weakened by false information promoted by industrialists who now employ and fund the majority of scientists in order to achieve the results they want rather than obtain objective scientific data. Much of the accepted scientific knowledge of 50 years ago has been undermined by the modern version where scientists are rewarded if they can find ways to suppress the true facts and to promote data that favours industry. The dangers should be obvious but the most damaging effect is to undermine the reputation of science itself. The suppressed evidence of harm to humans, animals, and the environment by pesticides and genetically modified crops are examples.

19. The potential exists now for rogue scientists to remove the DNA coding from meat so that those eating chicken will not know that pork meat has been added. Even more horrific is the fact that if this can be done with animal meat the same could be done with humans—and already scientists transfer DNA from human to animal and animal to plant on the assumption that they are simply dealing with chemicals. The same attitude regards one protein source as much the same as another causing the UK to suffer, and still suffer from, the BSE crisis.

20. The use of pharmaceutical herds has been hidden. Probably this is because the farmers have been robbed of vital raw material used for pharmaceuticals for decades without compensation for the taking of them or for the high costs of the rules intended to ensure that our herds are “clean” enough for that purpose.

21. In these times one step in the wrong direction could result in irreversible damage to the environment and humans. Commercial interests introduce dangerous uniformity, ignoring the fact that diversity is strength. The “science base” appears to be built on shifting sands.

*The provision of training*

22. Historically the training was done as part of the employment in the industry. Such systems were akin to apprenticeships and often involved, but not always, day courses or full-time courses at college. However in catering and agriculture students have been taught by their teachers a certain way to do the work only to find that the employer demands that entirely different methods are used. This undermines the confidence of the student but also makes life difficult for the employers who have to spend time re-training their employees.

23. This problem is compounded by the fact that fewer people wish to work long hours in often dirty, uncomfortable and dangerous conditions and, in agriculture the ever decreasing numbers of people employed on the larger estates. There is no longer the time or the inclination to train young people who will only leave the industry when they see that the remuneration is better elsewhere for much less work and fewer hours. Skills are being lost at a faster rate than ever before and soon there will be no one left who will know how to do the work correctly—in the real world.

*Trade barriers*

24. The current trade laws are all based on political and not food security considerations.

25. The USA uses trade controls and the so-called “Free market” as a means to foist its own products on the entire world. Any country that tries to protect itself from the power of the USA based chemical and seed companies has the full weight of the law thrown at it in order to force that country to accept potentially damaging technologies in the name of “Free Trade”.

26. The lack of trade barriers is actually damaging to the UK as a net importer of food and with the ludicrous position where exported food is of the same type as that imported, adding to environmental pollution, and risking importing deadly infections. This undermines UK farmers and the standards required of them for food safety and animal welfare. In an “open door” policy the costs of disease control and treating human illness will rise considerably.

*The way in which land is farmed and managed*

27. If current trends continue there will be fewer people working the land than ever in UK history. Farmers will be completely dependent on foreign suppliers for seeds, fertiliser, chemicals and machinery, both new and for the necessary repairs. That is dangerous for the UK, both for food security and for the balance of payments, but it will also have damaging effects on the environment and will be completely unsustainable.

28. If the farmers of 50 years ago had the equipment available today they would have been able to produce very high yields simply because the machinery would have enabled them to plough, sow and harvest the crops in a more timely fashion and to store them in conditions where there is little waste. Even bird scarers are more efficient than they were at that time and yet current "scientific" thinking suggests that farmers will be unable to grow crops as well today.

29. Do today's farmers really know how to farm the land? The traditional farmers understood the forces of nature and worked with them while the modern farmer thinks he can beat it into submission with mighty machines and poisons. It will never be sustained.

30. When Britain had to grow more of its own food it did so by intensive production on small areas of land. Every spare patch of ground can grow vegetables and the average family outside of the cities can contribute considerably to the food production of the nation using relatively small areas of land, with the added advantage of recycling any food waste, which is of course much less because food grown at home will include vegetables that are perfectly edible but which are rejected by supermarkets due to the required standards of uniformity.

31. Many benefits would follow if UK farms were smaller units. The land would be better used. More operators using smaller machinery using less fuel for the same work, maintained by more mechanics. Food supply could be truly "local". The environment could be rapidly improved and the biodiversity required for natural balance would be created relatively quickly.

32. Such a policy could be good not only for agriculture but also for our industry and the economy, with more people understanding food production and the associated problems.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

33. Defra has not been exactly impressive since it was formed after the failure of MAFF following the BSE crisis. It embraces the same organisations that failed us then and since little has changed it is likely that there will be similar failures in the future.

## SUMMARY

34. The current situation was entirely predictable. Many people warned that the failure to protect and support UK agriculture would endanger the food security of the country but "experts" ridiculed those who argued against the popular view.

35. There is a suggestion that the current situation has been deliberately engineered by those who wish to force the public to accept monoculture, genetically modified crops, and heavy pesticide reliance that comes with that technology. The fear of starvation is used as a "persuader".

36. As so often in the past the popular view is not necessarily the correct one or the most sustainable and it must surely not be beyond the intelligence of man to find ways to work with nature rather than to attempt to beat it into submission with poisons and heavy machinery, all of which rely entirely on fossil fuels, which we are told will destroy the planet.

37. Smaller well managed farms are able to treat the soil with the respect it deserves; improve drainage and reduce soil erosion; employ more people; produce more food per hectare, make use of poorer soils with grazing livestock that assist in building soil fertility; are more timely in essential cultivations and harvest; and, most of all, encourage diversity in crops grown, livestock reared, and the biodiversity in the natural environment upon which our very future depends.

38. Current leaders have the opportunity to correct the mistakes of the past. But will they act before it is too late and irreversible damage has been caused?

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## Memorandum submitted by Tenant Farmers Association (SFS 13)

### INTRODUCTION

The Tenant Farmers Association (TFA) was established in 1981 as an Association to represent the interests of tenant farmers in England and Wales. As such, the Association's focus is on those aspects of policy and practice which fall uniquely on the let sector in agriculture. However, there are, inevitably times when it is important for the TFA to have a view on wider issues as they impact upon tenant farmers and others within the industry. Securing food supplies up to 2050 is one such issue.

The TFA has a strong belief that there is a need for the UK Government and the EU authorities to develop specific policies in relation to food security taking into consideration both domestic and international concerns. Whilst the UK Government may feel that it has already set out a framework for dealing with food security issues in its Cabinet Office Report "Food Matters: Towards a Strategy for the 21st Century" the TFA would disagree. In our view, the report became sidetracked into issues related more to environmental and public health concerns distracting the attention away from the central question of how we sustain food supplies into the medium and long term.

### SCOPE OF EVIDENCE

The food system in the UK, let alone internationally, involves a large number of players. The focus of our evidence will be the perspective of primary producers and in particular those primary producers who rely upon rented land for their farm businesses.

The TFA is also aware that food security necessitates consideration of trade and domestic production. Without wanting to underestimate the importance of trade, our written evidence will focus on domestic production considerations as this is where our expertise lies. In any case, the lesson of the last two years is that global markets can be fickle and trade imbalances can affect developed nations.

#### *How robust is the current UK food system?*

The Select Committee has requested that those responding to the call for evidence in this Inquiry should look at the strengths and weaknesses of the UK food system. The TFA's analysis is provided below.

Turning first to strengths, we would firstly point to the dedicated, professional and resilient farming community. Over the past twenty years, domestic producers have faced both chronic and acute difficulties which have been faced with tenacity and resilience. However, the TFA would stress that this is not a good long term position and evidence from the dairy, suckler beef and pig sectors would point to the conclusion that pressures are beginning to impact on our supply capacity.

Secondly, the UK is blessed with good natural conditions in relation to soil, climate, political stability, and distribution networks. The TFA believes that the value of these aspects cannot be underestimated particularly when the UK is compared with other parts of the globe which are not so well endowed.

Thirdly, at least up until recently, the UK farming industry has access to leading technology and farm operators display a high level of skill.

Fourthly, in recent years, we have seen a resurgence in consumer demand for high quality, locally sourced food which the UK producer is well able to satisfy.

There are however a significant number of weaknesses which need to be addressed, as follows:

Firstly, the TFA believes that much will need to be done to repair the damage caused by thirty years of Government policy which has sought to undermine production agriculture due to an inability on the part of UK authorities to see past the problems of the Common Agricultural Policy. We have developed a policy framework which seems to value the environment at all costs and food production hardly at all. It is important that we urgently find a new balance between the production of environmental goods and services and food production.

A second major weakness in the UK's food supply system is the significant imbalance that exists between the power of retailers and the power of primary producers. We have allowed a relatively small number of very large operators to use their ongoing competition for market share to drive down the prices paid to primary producers to ensure that consumer-facing products are placed on shelves at the lowest possible price. The TFA believes that the proposed food industry ombudsman would be a significant check on this negative activity and would urge that Government should come forward with necessary legislation to bring this to fruition.

Thirdly, since the 1980's, we have seen the Government retreat from applied research and development which is deemed to be "near market". The TFA believes that if we are to address our future food needs then there is a legitimate place for Government involvement in funding medium to long term applied research and development which assists in improving our technical efficiency in producing food. This should include, but not be limited to, research into emerging technologies.

Fourthly, the TFA is concerned that the considerable increase in volatility is having a negative impact on our long term food security. Despite its many shortcomings, the Common Agricultural Policy did at least provide a degree of domestic stability to producers which we are now seeing reversed as the protection the CAP afforded is removed. Whilst the volatility that is now being experienced is leading to the development of ideas for new hedge funds and futures markets, the TFA does not believe that this is a stable framework within which primary producers and their landlords can be expected to invest. The TFA believes that policy solutions need to be developed to minimise the impact of volatility on long term decision making.

Fifthly, the TFA is concerned about the lack of opportunities available for new entrants to consolidate their businesses. Agricultural tenancies have traditionally been the way in which new entrants access the agricultural industry and whilst opportunities for new entrants still exist, particularly through the County Council Smallholdings system, there are now fewer opportunities for new entrants to establish themselves into the long term by moving into the private sector on longer and larger units. In all but a few cases, the market in agricultural tenancies from landlords like the Church Commissioners, Duchy of Cornwall and Duchy of Lancaster has all but dried up. This is in part due to the need to rationalise existing units but also in part due to the lack of incentives for landlords to let longer term.

Sixthly, the TFA believes that we are turning our back on traditional methods of production which have served us well in the past and should serve us well in the future. For example, our suckler beef industry has relied upon a steady stream of calves coming down from the hills where they have been bred to be fattened on lowland units before going to market. That structure is now in rapid decline due in part to the complete removal of subsidies on breeding livestock and also in part due to the regulations for livestock marketing and slaughtering.

Finally, the TFA is concerned about the lack of brand ownership amongst farmers which has been caused due to regulatory interference such as the splitting up of successful co-ops like Milk Marque and too strong a reliance upon assurance schemes such as the Red Tractor.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production?*

The TFA believes that tackling and addressing issues of food security is at least as important as climate change. However, in comparison, issues of food security barely get a look-in whereas climate change policy seems to permeate every aspect of Government thinking. This is beginning to change but it will need to change faster if we are going to be able to contribute to the increasing global food need. Despite the resilience of the agricultural industry noted above, we have seen in recent times how quickly capacity can be lost with the dairy industry, pig sector and suckler beef industries as cases in point.

Even now, Government policy seems to conspire against the demands and needs of ensuring food security. When the rest of the world is focused upon how to meet the demands of a growing world population, the UK (and more specifically England) continues to be transfixed with policies to reduce production. Examples of these include Defra's desire to replace compulsory set-aside with a new set-aside regime using the cross-compliance criteria of the Single Payment Scheme, its continued inability to deal with bovine TB which causes the needless destruction of many thousands of beef and dairy animals year on year and the Government's unwillingness to grant-aid the extra slurry storage capacity that livestock farmers will need to comply with new Nitrate Vulnerable Zone Regulations which will inevitably force many of them out of business. If such an attitude to production agriculture continues then we will not be able to be equal to the challenges for food security which are with us now and will increase in the future.

It is right that a balance is struck between ensuring that we are efficient agricultural producers and also managing and enhancing the environment. The Government's approach is wedded to restrictive agri-environment schemes whereas more flexible approaches should be sought in consultation with bodies like Linking Environment and Farming (LEAF) and the Farming and Wildlife Advisory Group (FWAG).

*What assistance should the Government provide to the food industry?*

Firstly, the UK Government needs to revisit its avowed position that food security can only be tackled through trade. In setting out its vision for the Common Agricultural Policy in 2005, Defra and the Treasury stated the clear Government position that sustaining domestic production was neither a necessary nor sufficient condition for food security. The TFA believes that that is misguided and if followed as a policy will do severe damage to our ability to contribute to the rising demand for food globally over the next thirty to forty years.

Secondly, the TFA believes that food security should be placed firmly in the basket of public goods that the Government has a legitimate interest in securing. To date, that basket of public goods in relation to agriculture has been too much skewed towards environmental management and the TFA believes that it is time that food security issues featured more significantly within the bundle.

Thirdly, the TFA believes that some direct support for agriculture will continue to be necessary particularly for hill areas and particularly for breeding livestock. This will need to be done with due care so as not to cause unhelpful distortions in domestic and global markets.



Fourthly, the Government must do more to help influence long term thinking within the landlord/tenant sector in agriculture. To do so, the TFA recommends that the Government should look again at the fiscal and structural recommendations made by the tenancy reform industry group in 2003 which have never properly been implemented by Government.

Fifthly, the Government should continue to play a leading role in securing and funding applied research and development in the food and food technology arena.

Sixthly, the UK should be leading the way in developing EU-wide systems which help to deal with volatility in both input and output markets which will allow farm operators a more stable framework within which to invest for the future.

Seventhly, the TFA believes that the UK Government needs to consider the food security impact of changes in regulation and taxation on a formal basis. Given the importance of food security as a policy goal, in preparing regulatory impact assessments for policy change the Government should be required to consider if there are any food security impacts.

Eighthly, the Government has a responsibility to ensure it is playing its full part in maintaining high animal and plant health standards through strong border controls, investing in appropriate applied research and development, implementing necessary disease eradication programmes and continuing to pay its fair share of the costs associated with animal and plant health policies.

Finally, in relation to our position globally, the UK Government should be doing as much as possible to encourage exports from the UK to other parts of the EU and elsewhere. In this respect, the TFA believes that it was a retrograde step for Defra to cease funding Food from Britain.

#### *Annual report to parliament*

In order to ensure that food security maintains its importance, the Government should be required to produce an annual report to parliament detailing what it is doing to ensure future food security both through trade and domestic production. Targets should be set in which the Government seeks firstly to stop the decline in UK self-sufficiency in temperate products and seeks also to encourage exports from the UK.

#### CONCLUSION

The TFA welcomes the Select Committee's Inquiry into this important area of policy and believes that it is vital that policy on food security becomes a central plank of public policy in the future.

*January 2009*

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### **Memorandum submitted by the Biodynamic Agricultural Association (SFS 16)**

#### INTRODUCTION

1. Biodynamic agriculture was inspired in 1924 by the holistic and spiritually oriented research of Rudolf Steiner (1861-1925). Over the last 85 years it has grown into a worldwide movement and is now practiced in more than forty countries. It is one of the most sustainable and organic approaches and is applicable in every climatic zone. See website for biodynamic FAQ.<sup>60</sup>

2. Demeter is the name of the ancient Greek Goddess of fertility. Today it is used as a certification mark on all products which have been certified as complying with strict international standards for biodynamic production and processing. See website for full Demeter Standards.<sup>61</sup>

3. Biodynamic Preparations are made from specially fermented materials of plant and mineral origin. They are used in the biodynamic system to stimulate plant assimilation, regulate metabolism in soil and plant and enhance the vitality and quality of the final product. They have been described as a form of homeopathy for the earth.

4. Research Biodynamic food is consistently known for its high quality. A research project recently undertaken comparing the effects of processed conventional, fresh organic and biodynamic food against a wide range of health and well being criteria, has again demonstrated the vitality and health giving properties of biodynamic food. A summary of results is available on the website.<sup>62</sup>

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<sup>60</sup> www.biodynamic.org.uk

<sup>61</sup> As above.

<sup>62</sup> As above.

## 1. *How robust is the current UK food system?*

### *How well placed is the UK to make the most of its opportunities*

The UK food system has become increasingly vulnerable and dependent on a low cost global transport system. With the majority of its food supplies coming from overseas, any interruption of supply (through oil shortages, terrorism, war, etc.) could prove disastrous. This is exacerbated by the widespread policy of last minute supply by Britain's major supermarket chains—the lorry drivers strike and blockade of oil depots a few years ago clearly demonstrated this danger. Cheap oil and an ongoing cheap food policy is feeding a growing problem. It only needs a prolonged oil shortage (the oil and food price rises in the summer of 2008 was a warning) to make imported food unaffordable.

### *Challenges facing the UK food system*

A fundamental shift in direction is needed if the UK is to respond to the challenge of producing more of its own food. Over the last century the UK has been leading the way towards creating an efficient and specialised industrial farming system. This has meant that farms have grown in size and fewer people have been employed per acre, artificial fertilisers and specialised mono-cropping techniques have been followed and expensive and toxic pesticides have had to be used. This has proved very profitable for the relatively few large sized farmers but is inherently unsustainable in the long term. In an age of cheap oil such a system can appear efficient and profitable. Scratch the surface however and enormous long term problems become apparent:

- Toxic residues in soil and food stuffs.
- Health problems caused by these residues.
- Environmental damage, loss of biodiversity.
- Empty landscapes with no people and rural unemployment.
- Factory farming and abuse of animals.
- Heavy reliance on oil and oil based products.
- Cumulative loss of fertile soil.

Soil is the most important ingredient for healthy food production. Unfortunately the practitioners of industrial agriculture ignore this and in effect operate a system of “soil mining”. This is demonstrated by the fact that fertiliser use per acre increases year on year as result of ever declining soil humus reserves. Through applying lifeless fertilisers these highly exploited soils are themselves becoming lifeless. They ultimately serve as little more than root stabilising media. Were it not for our moist climate the once fertile soils of Britain would already be desert.

The UK is blessed with a great diversity of farming landscapes and a rich cultural history. Although suffering great decline there is still a strong skill base in rural communities. There is also growing consumer interest in being involved in local, sustainable food production. This is complimented by a well established network of highly successful farmer's markets, local food networks, distribution cooperatives, box schemes and community supported farms. Although still small in relation to the UK food market, these initiatives have a huge potential for securing sustainable sources of food. There is also a strong organic sector which can lead the way towards a new focus on high quality produce free from toxins.

### *How to progress*

The UK could once again feed itself but only if the destruction of our soils is halted and serious efforts are made to develop soil fertility and introduce a truly sustainable form of agriculture. There are several things which can and should be done:

- *No more fertilisers and pesticides*  
The success of the organic movement demonstrates that farming without fertilisers and pesticides is not only possible but also profitable and beneficial to the community as a whole. The health benefits of eating organic food free of toxins are also well known.
- *Farm in harmony with nature*  
A healthy farm is a mixed farm embedded in the natural environment of the district. The intimate relationship between woodland, hedgerows, wetlands, meadows and hillsides etc. is vital for ensuring stable and well balanced bio-diversity and a healthy environment.
- *Build soil fertility*  
Cropping must take the building of soil fertility as its starting point. This means arranging fertility building crop rotations, developing mixed farms with livestock fed from the farm, maximizing the use of manures, composts green manures and grass leys. Biodynamic preparations can be used to stimulate soil life and enhance vitality.

- *Encourage a reduced consumption of meat*  
Livestock form an essential part of a farm enterprise. Their main purpose is to increase soil fertility. They can only do this if they are fed with home produced feed. This in turn limits the number of livestock each farm can keep and therefore the amount of meat produced. It has been calculated that a sustainable level of meat consumption is approximately two meat dishes per week.
- *Encourage small scale quality production*  
Many more people need to be involved with food production, as home producers but also within the context of small farm production. Small scale is especially important to achieve quality. A small area of land can be far more intensively managed and made more productive than a large area of single cropping.
- *Contribution to world food supplies*  
Britain is very heavily populated and its first priority should be to feed itself. By reducing imports of food from other countries, the UK would contribute significantly to food availability in other countries. There is enough land in these islands to supply the UK population if it is managed in a sustainable way (as described above). There would be little scope for food exports but this in itself will provide a large contribution towards the UK climate change targets.
- *Biodynamic agriculture*  
A healthy farm is a mixed farm embedded in the natural environment of the district. The intimate relationship between woodland, hedgerows, wetlands, meadows and hillsides etc. needs to be considered and is vital for ensuring a stable and well balanced diversity. All of these landscape elements and the wild flora and fauna that accompany them are integral to a truly sustainable farm. Their presence is important both for the farm and the quality of the entire surroundings. If then the farm is able to rely on its own resources to feed its livestock and build fertility, a truly sustainable system can come about. Additional biodynamic measures can be applied to strengthen the vitality and disease resistance of both crops and stock and also enhance the nutritional quality of the food produced.

(b) *Challenges faced by the UK in relation to:*

- (i) *water availability*  
Food production methods which rely on a healthy humus rich soil use generally less water. Sustainable mixed farming in biologically rich landscape (with trees, hedges, etc) tends to slow down water loss and hold moisture in the soil.
- (ii) *the marine environment*  
The UK has a huge resource area. Unfortunately the same unsustainable methods have been applied as on the land and fish stocks are now greatly depleted. Toxins must be removed, beaches cleaned up, radioactive fallout must be stopped and the sea should no longer be the place where sewerage and industrial wastes end up. With care and consideration the wealth of the seas will return to our shores.
- (iii) *the science base*  
The UK has a well of innovative skills and a lot of research skills. More research into sustainable agriculture would be very important to help the country move forward more rapidly. However there is also a lot of experience already available through the organic and biodynamic movements as well as long forgotten written research which could be drawn on to help progress.
- (iv) *training*  
There is a great need to support the training of young farmers. Training should be practical apprenticeships rather than purely college based. Learning with other farmers is a well proven approach.
- (v) *trade barriers*  
A few trade barriers might be a helpful incentive to bring about the needed change in direction.
- (vi) *the way land is managed*  
Needs to move decisively towards a wholly organic and self-sustaining system.

2. *Emerging trends in the UK food system*

It is likely that the interest in local organic food will continue to grow. At the same time the taste for variety and world foods will remain strong. This means that trade in exotics will continue to be an important part of consumer tastes. At the same time there will be a growing demand for the local production of all the staples. This fits in very well with the above mentioned suggestions for a sustainable farming system. The current local food networks would then become the main means for distribution.

Defra's role should primarily be to encourage a move to sustainable agriculture employing both the second pillar framework and a resourced research and training programme.

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**Memorandum submitted by the Federation of Wholesale Distributors (SFS 17)**

*Re: Securing food supplies up to 2050: the challenges for the UK*

This input to the above inquiry is from the Federation of Wholesale Distributors on behalf of the UK grocery wholesale industry that represents an indispensable supply channel to some 50,000 smaller retailers (mainly convenience stores) and approximately 350,000 catering and foodservice outlets. Our comments, therefore, focus on the demand side of the food industry rather than the supply side.

In 2007, the Institute of Grocery Distribution (IGD) valued our sector at £24.1 billion, split between cash and carry wholesalers (£9.5 billion), delivered grocery wholesalers (£8.3 billion) and delivered foodservice wholesalers (£6.3 billion).

1. In a current UK food retail market that is precariously (in our view) dominated by four large supermarkets, wholesalers provide the only sizeable alternative supply channel of food and drink—and in logistical terms this reality should be appreciated as an important “strength” in the UK food system.

2. The wholesale mechanism, as represented by the membership of the FWD, is recognised by the principal suppliers/manufacturers of grocery products in the UK as their only effective route to the diverse independent retail and catering markets.

3. It is important to note that these producers no longer possess the capacity to deliver their products directly to the thousands of smaller retailers and caterers of all types themselves. Wholesalers provide this important function far more efficiently.

4. A serious “weakness” in the UK food system was revealed in year 2000 when fuel price protests took place that blockaded oil refineries. The disruption to the “just in time” supermarket supply chains that ensued from shortages of petrol and diesel fuel nearly brought the country to its knees, and delivered a sharp wake-up call of this danger to Government.

5. Therefore, the FWD believes it is imperative to safeguard a robust and competitive wholesale sector that maintains the supply chain to the smaller, local and rural stores that are mainly located a short walk away from where most of our population lives.

6. We see the greatest potential weakness to the UK food system as the growing over-reliance on out of town superstores, together with a continuing decline in the number of local food shops.

7. This on-going trend is perpetuated by an inequity in the buying price differentials enjoyed by the major supermarkets over grocery wholesalers.

8. A supermarket buying price advantage was clearly revealed by the Competition Commission in year 2000 in its Supermarkets Inquiry. Similar evidence came to light when the CC concluded its Inquiry into the UK Grocery Market last year.

9. Its final report published in April 2008 showed that wholesalers suffered up to a 15% buying price disadvantage, but the CC signally failed to make any critical comment on the matter. In terms of levelling the playing field for the UK’s independent convenience store operators and the wholesalers who provide their supply channel, the CC delivered a resounding zero.

10. The FWD believes it is imperative that this imbalance is corrected—in particular, for the bulk purchasing of grocery products—in order to ensure a diverse UK grocery market in the long-term.

11. Wholesalers should be able to achieve parity, or near parity, on price for their largest purchases (i.e. full lorry loads of a single product). The FWD recommends therefore that the Government should take immediate action to achieve a transparently fair grocery marketplace.

12. In further relation to the retail situation, we endorse and commend to you the remarks and recommendations made to your Committee by the Association of Convenience Stores (ACS). That trade body represents convenience retailers that FWD members supply and therefore we very much share the concerns that they have raised.

13. In particular, we believe it is of prime importance to the UK’s food security that a pro-active Ombudsman is quickly established to develop and enforce the Grocery Supplier Code of Practice that was recommended by the Competition Commission in April last year.

14. Equally, we support the view that future food security will be enhanced if access to food from shops within easy walking distance for most of the population is maintained. In this respect, the FWD believes that ensuring a fair and vibrant grocery market that does not disadvantage smaller players should be a consistent, on-going Government priority.

15. Five years ago, the Federation of Wholesale Distributors launched its “My Shop is Your Shop” activity. This campaign is a consumer and marketing platform that helps independent c-stores, newsagents and rural shops by emphasising their unique role in the community they serve. It promotes the genuine value to the local community that the personal interface of the owner of the local shop provides. Full details are available on the MSYS website at [www.myshopisyourshop.co.uk](http://www.myshopisyourshop.co.uk).

16. One very relevant aspect of the campaign to your inquiry is that in the next few weeks MSYS will re-launch its Walk & Shop activity. This gives independents a real and positive, money-saving proposition for their communities. The two-pronged message that this campaign delivers encourages shoppers to ditch the car and shop locally, just in time for their daily grocery needs.

17. The cost saving aspect is simple to propose and easy to comprehend—it is, avoid wasting food by over-buying at the superstores and also save on petrol costs. Additionally, Walk & Shop gives independents a unique environmental platform through the related reduction in carbon emissions.

18. The foodservice and catering industry is another important customer component of the wholesale marketplace. Despite the current economic conditions, we anticipate a growing need to serve the out-of-home eating requirements of the nation. The overall trend is that we are spending less of our time eating at home and more time eating out.

January 2009

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### Memorandum submitted by Dr Howard Lee (SFS 18)

#### EXECUTIVE SUMMARY

In my view the current UK system is not robust. It is heavily dependent upon fertilisers derived from fossil fuel inputs that are at risk and is also likely to be adversely impacted by predicted Climate Change. This means that it will not be able to respond to increasing demands from the global market and it will also be at risk of not being able to satisfy the domestic market.

I have summarised the main reasons that lead me to this conclusion and have also suggested some strategies to mitigate against food insecurity. Defra, or possibly a new Government Department for Food Security, need to have contingency planning in place to cope with the demand to meet a higher percentage of our domestic consumption and the risk of interrupted food supplies. This will require out-of-the-box thinking, since it is quite likely that fine-tuning existing systems of production will not be enough to face the challenges ahead. It is recommended that these ideas need urgent investigation and critical appraisal if the Government is to ensure that all scenarios are covered and the food security of the UK maximised during the 21st Century and beyond.

An important key step will be to undertake research to determine what practical solutions can be introduced. For example alternative farming methods or the growth of urban food production backed by community support. Appendix A provides further details and summarises research projects that would inform this planning.

#### 1. *How robust is the current UK food system? What are its main strengths and weaknesses?*

The current UK food system is extremely insecure and the following weaknesses are important:

1.1. Domestic food production is largely based upon fossil fuel inputs, which are likely to become increasingly unavailable. Global demand for oil and natural gas is already close to exceeding that of supply<sup>63</sup> and current price fluctuations are due to a combination of factors stemming from economic instability caused at least partly by fear of fossil fuel shortages. Thus, security of supplies of fossil-based mineral fertilisers and synthetic pesticides are likely to be compromised. Modern crop cultivars have been bred to produce only if supported by these inputs and thus severe yield penalties are likely if these inputs are compromised, especially for herbicides and other specific pesticides. Diesel shortages will also affect machinery use on farms, where reliance on fossil motive power is almost universal.

1.2 Climate change is now understood to involve increasingly severe Extreme Weather Events (EWEs). British soils have indicated declining rates of soil organic matter (SOM) over the past 50 years. SOM is well known to affect soil properties, improving structural stability, porosity and drainage potential, encouraging beneficial soil fauna, releasing a steady rate of macro and micro nutrients and improving water holding capacity and drought tolerance. The implications of EWEs for many British soils with low SOM are that crops are increasingly liable to suffer from drought stress when there is low rainfall and soils to erode when precipitation is excessive, all of which will further reduce yields.

1.3 Currently UK agriculture can feed between two-thirds and three-quarters of the population. It is estimated that, as the above limitations take effect over the next ten years, that this level of self sufficiency will drop below 50%.

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<sup>63</sup> It is important to remember that it is not the total quantity of fossil fuel that matters, but rather what can be obtained at any given time: thus, promised reserves are of no help unless they can be accessed quickly and economically.

2. *How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

2.1. Due to the above reasons, unfortunately the UK will not be in a position to contribute to increasing global food production as detailed between now and 2030, though this might change subsequently if domestic food production increases are achieved.

3. *In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

3.1. *Soil quality* There is a problem of relatively poor drainage of farmland. This is due to compaction by larger machinery, poor investment in drainage systems and lower SOMs as stated above. Thus there is an increasing frequency of water logging events. This quickly kills most crop species and also leads to losses of nitrogen from soils as Nitrous Oxide (N<sub>2</sub>O—a greenhouse gas approximately 200 times more damaging than carbon dioxide).

3.2. *Water availability* Less water will be available on farm land, since compacted soils cannot quickly absorb and retain sudden rainfall. Water shortages are liable to affect both rural areas (where more irrigation will be needed to counteract shortages; 30% increase expected by 2050) and urban zones as the expectations of citizens continue to increase.

3.3. *The marine environment* Coastal inundation will further reduce farmland and have a small but measureable effect on total production (57% of grade 1 arable land is below the 5m contour line).

3.4. *The science base* Research in agriculture has declined and, more importantly, not investigated the issues highlighted below. There will need to be an urgent injection of funds to help us understand and develop a new skills base.

3.5. *The provision of training* New R&D detailed below will need to be rapidly outreached into the farming sector, with widespread provision of relevant training. Here at Hadlow we have set up the first degree in Sustainable Land Management to help address these issues.

3.6. *Trade barriers* These will tend to restrict fossil fuel supplies and also compromise our access to food imports as new agricultural production areas in eastern Europe decline. Most food exporting nations will be facing similar problems in agriculture and thus disinclined to export to us. Basically we will soon be facing a severe deficit of fossil fuel and imported food supplies.

3.7. *The way in which land is farmed and managed* This will not be fit-for-purpose as the above changes occur. Fundamental shifts in farming and land management policies will be required.

4. *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

4.1. Consumer tastes and habits will be altered, not by free choice but as some foods become prohibitively expensive. There will be an emphasis upon local meats, vegetables and fruits—accessibility and price will tend to dictate eating habits and there will be a return to seasonal food. Local food networks will be useful in facilitating access to produce but will need to be developed to incorporate a large expansion in local production.

5. *What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

5.1. Defra needs to accept the impending problems of food insecurity and explore some novel options:

5.1.1. Defra should have contingency planning for events such as interrupted food imports or oil and natural gas supplies cannot be guaranteed. The suggested key priority will be the development of long term supplies of sufficient energy, food and water for all UK citizens. This will entail some “out-of-the-box” thinking and planning. Some suggestions for how UK agriculture might secure food supplies for the future are listed below. The needs of citizens for energy and water are also considered *en passant*, since all three are interrelated.

5.1.2. Urban food security needs to be considered as a priority given this is where most UK citizens live. It is suggested that urban-wide food production plans would be needed but that the implementation would focus upon self-organised and motivated local groups of citizens (approximately 500 people per group) in adjoining housing, who aim for a large measure of self sufficiency in energy, food and water by means of a sophisticated integration of:

- (i) Organic societal waste streams—processed *via* anaerobic digestion (AD) for methane fuel (one commercial AD unit should provide sufficient methane to generate electricity for approximately 500 people in 250 houses)—additional methane for motive power (petrol engines can easily be adapted to run on methane)—and subsequent composting of digestate as a fertilizer;

- (ii) Communal food production in all available spaces, subject to soil testing for freedom from contaminants—using intensive, raised-bed and protected cropping (e.g. polythene tunnel or equivalent) techniques and also composts as fertilizer from (i) above;
- (iii) Micro livestock, as detailed below;
- (iv) Water harvesting from houses and also the development of micro reservoirs where possible. There are some associated retro-fit policies needed for housing but those are outside the scope of this Defra inquiry and so are not detailed here.

5.1.3. The production detailed above for urban areas would need to stretch outside each city and town. The size of this peri-urban zone would depend upon population size and efficiency of production. In both urban and peri-urban areas, micro-livestock maintenance would be an integral part of food production, absorbing organic wastes, being able to live in relatively small areas and growing relatively quickly. Examples are pigs and chickens, though others could include goats, rabbits etc.

5.1.4. Overall, rural agricultural land in the remainder of the UK and outside urban areas would also need to be re-assessed. Upland areas would always present relatively low production potential but need to continue to be managed, albeit extensively. It is recommended that the management of lower altitude rural land would need some fundamental changes if its food production potential was to be maximised:

- (i) Previous studies on low-input production and a wealth of knowledge and experience from organic farming would need to be re-visited and incorporated as a reference data base. However, this would not be sufficient—nobody has attempted to manage a modern mixed farm with machinery but lacking external fossil inputs and such developments would be mostly novel;
- (ii) Existing knowledge indicates that farming without fossil inputs would depend in part upon maximising the efficiency of nutrient cycling and this is known to be facilitated by the presence of livestock (especially cattle and sheep). Thus, most rural stockless UK farms would need to consider the re-introduction of livestock;
- (iii) As indicated above there would also need to be a priority to encourage rapid increases in SOM, though re-introducing livestock will assist this.

5.1.5. The above developments will lead to new commercial enterprises—it is suggested that trading would become increasingly localised and potentially vigorous. Small and Medium Enterprises (SMEs) would have an important part to play, both in urban and rural areas. New employment opportunities would arise, requiring new skill sets.

*6. How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

6.1. There is insufficient engagement currently but the impending food security situation means that Defra can demonstrate internationally what can be done to address the impending shortages. This will be an opportunity for us to show others what can be done. However, the immediate priority is to develop a much stronger cross-Government food strategy by the formation of a new Government Department for Food Security.

*7. What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

7.1. Defra already has some effective sustainability indicators in place but these need to be channelled into an assessment of food security in the UK in the face of reduced inputs and EWEs.

## 8. Appendix A

*Suggested policies and actions for a worst case scenario*

8.1 Detailed below is a summary of policies that may be required if:

- Oil and natural gas imports cannot be guaranteed and UK agriculture and associated chemical input industries face an interruption of supply. Longer term interruptions will also affect the machinery sector but this has not been included below, though it could be;
- All food imports into the UK are interrupted;
- This occurs in a climate change scenario of EWEs of continuing or increasing severity.

8.1.1 What if the above situation occurred? It is recommended that Government consider such a possibility and that contingency planning is put in place. The policies suggested below are summarised as key points, but can be elaborated. The suggested key priority will be the development of long term supplies

of sufficient energy, food and water for all UK citizens. This will entail some “out-of-the-box” thinking and planning. Here below are suggestions for how UK agriculture might secure food supplies for the future. The needs of citizens for energy and water are also considered *en passant*, since all three are interrelated.

8.1.2 Defra (or a new Department of Food Security) cannot restrict agricultural policies to rural areas—there needs to be an integration of rural and urban potential:

## 8.2 *Urban food security*

8.2.1 This might not be seen as the remit of Defra, but a priority focus is needed for urban areas (cities, towns and villages greater than approximately 10,000 citizens), since this is where most UK citizens live. It is suggested that urban-wide food production plans would be needed but that the implementation would focus upon self-organised and motivated local groups of citizens (approximately 500 people per group) in adjoining housing, who aim for a large measure of self sufficiency in energy, food and water by means of a sophisticated integration of:

- (i) Organic societal waste streams—processed *via* anaerobic digestion (AD) for methane fuel (one commercial AD unit should provide sufficient methane to generate electricity for approximately 500 people in 250 houses)—additional methane for motive power (petrol engines can easily be adapted to run on methane)—and subsequent composting of digestate as a fertilizer;
- (ii) Communal food production in all available spaces, subject to soil testing for freedom from contaminants—using intensive, raised-bed and protected cropping (e.g. polythene tunnel or equivalent) techniques and also composts as fertilizer from (i) above;
- (iii) Micro livestock, as detailed below;
- (iv) Water harvesting from houses and also the development of micro reservoirs where possible. There are some associated retro-fit policies needed for housing but those are outside the scope of this Defra inquiry and so are not detailed here.

8.2.2 The production detailed above for urban areas would need to stretch outside each city and town. This peri-urban zone would need to extend out from urban centres, with the distance depending upon population size and efficiency of production.

8.2.3 In both urban and peri-urban areas, micro-livestock maintenance would be an integral part of food production, absorbing organic wastes, being able to live in relatively small areas and growing relatively quickly. Examples are pigs and chickens, though others could include goats, rabbits etc.

8.2.4 Urban and peri urban food production would need to be planned carefully, depending upon the perish-ability of produce and distance to consumer. The ideas of geographers such as von Thünen in early 19th Century pre-industrial Europe and more recently by Braudel are incomplete but give some guide for a useful starting point. We would need to revisit these and other ideas and combine them with more recent thinking—and Geographic Information Systems (GIS) mapping would be needed to integrate such concepts in order to develop effective urban land use maps, utilising transport hubs and local resources on a site-by-site basis.

## 8.3 *Blending into rural areas*

8.3.1 The development of zones of peri-urban production, in a sophisticated development of von Thünen’s and other’s ideas, would tend to blend into rural areas, for example with the production of perishable items (such as dairy) extending into urban areas along road, rail, river and canal transport spines.

8.3.2 Overall, rural agricultural land in the remainder of the UK and outside urban areas would also need to be re-assessed. Upland areas would always present relatively low production potential but need to continue to be managed, albeit extensively. It is recommended that the management of lower altitude rural land would need some fundamental changes if its food production potential was to be maximised:

- (i) Previous studies on low-input production and a wealth of knowledge and experience from organic farming would need to be re-visited and incorporated as a reference data base. However, this would not be sufficient—nobody has attempted to manage a modern mixed farm with machinery but lacking external fossil inputs and such developments would be mostly novel;
- (ii) Existing knowledge indicates that farming without fossil inputs would depend in part upon maximising the efficiency of nutrient cycling and this is known to be facilitated by the presence of livestock (especially cattle and sheep). Thus, most rural stockless UK farms would need to consider the re-introduction of livestock;



(iii) As indicated above there would also need to be a priority to encourage rapid increases in SOM, though re-introducing livestock will assist this.

(i) to (iii) above are just a summary—there would be much more detail required as part of this management regime and this could be provided.

#### 8.4 *Economic activity*

8.4.1 The above developments will lead to new commercial enterprises—it is suggested that trading would become increasingly localised and potentially vigorous. Small and Medium Enterprises (SMEs) would have an important part to play, both in urban and rural areas. New employment opportunities would arise, requiring new skill sets.

#### 8.5 *Suggested research*

8.5.1 The above worst case scenario policy suggestions verge on the revolutionary and no Government body would consider their implementation without careful study. However, it would be prudent to plan for this scenario and the following R&D is suggested as a matter of urgency:

##### 8.5.2 *Overall investigation*

A desktop study is needed to access all existing information that can be utilised, including low input studies and experiences from organic production. This would form a vital base to identify further required research.

##### 8.5.3 *Urban investigation*

A pilot study is needed of at least one chosen urban area of 500 citizens in contiguous housing, where the above policies can be explored and assessed. Budgetary and other constraints might require a smaller number of participants and this should be considered if necessary. The important point is to investigate this option, no matter how small-scale it might be. The key question will be: what proportion of its requirements for food, energy and water can be obtained by such a group? The food production aspects will require some specialist horticultural knowledge and some participants will need to be offered training, though mutual sharing of knowledge and support within such a group is also expected. Group self-help and the dynamics of the development of social capital will be an important component of this study. Much would be learnt from such an investigation and many ongoing improvements achieved—i.e. a greater level of medium and longer-term self sufficiency might be achieved than had initially been expected. Clearly, wider transport and organisational issues cannot be addressed unless an entire urban area is developed, though desktop modelling could be taken forward.

##### 8.5.4 *Rural investigation*

At least one and preferably several stockless farms would need to be developed for this scenario, covering the major soil types and management scales (i.e. small family farm to large scale estates). For the rapid introduction of livestock, “pre-fabricated” livestock housing would need to be explored, that could be erected quickly. Just as in urban developments, the main priority on rural farms would be to determine the maximum sustainable yield of food, energy and water that could be obtained from such a system. Ideally the farm would need to be developed as self sufficient in all three and able to export at least useful and increasing quantities of food as expertise is refined.

##### 8.5.5 *Extension and Training*

Any new developments would require support both for farmers and other citizens: free or subsidised training would be required to help farmers adjust and urban citizens adapt. Additionally, the development of commerce would require new skills to match employment opportunities and relevant training would be needed (including small scale engineering, AD waste management, composting, horticulture, livestock husbandry etc.). There would be some psychological barriers to the adoption of these concepts, since there is a natural reluctance by many towards fundamental change. Counselling and other personal support would be required in addition to practical advice.

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**Memorandum submitted by Nicholas Saphir (SFS 19)**

**BACKGROUND***Currently:*

Executive chairman OMSCo (the UK Organic Milk Suppliers Co-operative) 2003; Chairman Coressence Ltd<sup>64</sup> 2006; director Bodin & Nielsen Ltd 1975; Chairman and Trustee of several trusts and foundations. Director City Food Centres Limited, 2005.

*Previously:*

Farmed 1,000 acres of fruit and arable in Kent; responsible for corporate fruit and vegetable farming activities and investments in South Africa, Zimbabwe, Argentina, Uruguay, Holland.

Chairman and chief executive of Hunter Saphir plc, a fresh produce and food manufacturing group which was sold to Albert Fisher plc in 1992; remained on Board until 1997; non executive director San Miguel SA (Argentina)<sup>65</sup> 1993–1998 and 2001–2007; non-executive director of Dairy Crest plc 1987–1993.

Chairman Rural Reviva<sup>66</sup> 2002–2007; chairman of the Agricultural Forum<sup>67</sup> 2001–2004; president of the Fresh Produce Consortium<sup>68</sup> 1997–2000.

Founder chairman of Food from Britain<sup>69</sup> 1983–1987; chairman of the Central Council for Agricultural and Horticultural Co-operation<sup>70</sup> 1980–1983; a member of the Ministry of Agriculture Fisheries and Food's Inputs Task Force; member of the Food and Drink Economic Development Council 1984–1987.

Author of the London Wholesale Markets Review (2002) commissioned by Defra and the Corporation of the City of London on the future of London's wholesale-markets and several papers on the future of the countryside.

**1. INTRODUCTION**

This submission addresses the issue of food distribution outwith the supermarket supply chains and with particular reference to the third of all food and drink consumed in the South East of the UK. It is based on work undertaken for the Review of London Wholesale Markets<sup>71</sup> subsequently updated in presentations including to the Covent Garden Market Authority (CGMA) in April 2006 and the National Association of Wholesale Market Authorities. It considers the needs of consumers and the ongoing development of Britain's food and farming industries particularly in the context of *Food Matters, Farming and Food, a sustainable future, Healthy and Sustainable Food for London* and *The Review of London Wholesale Markets*.<sup>72</sup>

It argues for an understanding of the opportunity to build on the UK wholesale food markets as centres of improved food distribution, food education, food centres for SMEs and start ups and for providing answers to the issue of environmentally sustainable logistics through consolidated distribution and waste management.

**1. The Issue**

Since the Review of 2002 was published several of the main wholesale markets throughout the UK have started to develop projects based on ideas included in the Review in terms of composite distribution and an emphasis on added value preparation. London, however, has not benefitted from the Review.

Ongoing environmental and commercial damage is being done to London by the continuing Charter based monopoly rights of wholesale food markets. These ancient rights prevent competition and have resulted in the third of all food and drink distribution that goes through non supermarket outlets, particularly to catering establishments, having to be delivered to, purchased and distributed from different

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<sup>64</sup> A company developing functional food extracts from apples.

<sup>65</sup> An Argentine public company farming 15,000 hectares and processing 350,000 tonnes of fruit.

<sup>66</sup> A Social Enterprise Foundation, part of the Plunkett Foundation.

<sup>67</sup> The Agricultural Forum was formed in the 1970s to promote understanding and development within the various parts of the UK agriculture and food industry.

<sup>68</sup> The Fresh Produce Consortium is the trade association that represents the interests of the UK trade and retailers of fresh fruit and vegetables.

<sup>69</sup> Food from Britain was set up by the UK Government in 1983 to improve and promote the marketing of British food and drink in the UK and world export markets.

<sup>70</sup> The Central Council for Agricultural and Horticultural Co-operation was the Government agency responsible for the development of agricultural co-operatives and the distribution and monitoring of grants.

<sup>71</sup> *Review of London Wholesale Markets*, Saphir, commissioned in 2002 by Department for Environment, Food and Rural Affairs (Defra) in conjunction with the Corporation of London 2002.

<sup>72</sup> *Food Matters*, the Cabinet Office Strategy Unit report July 2008, *Farming and Food, a sustainable future*, The Policy Commission on the Future of Farming and Food report to Government, January 2002. *Healthy and Sustainable Food for London*, The Mayor's Food Strategy, 2006.

markets on different delivery vehicles mostly to the same customers, thereby causing unnecessary commercial costs, pollution and congestion with no compensating benefits except for a damaging continuity of archaic traditions. It also means that no markets in London are large enough to deliver the benefits, commercial and public, available from the implementation of the original Review and subsequently developed Food Centre ideas. Fragmentation means that there has been an over-allocation of land, capital and resources to the duplication of supply chains that are no longer viable in isolation. This also means that there is a shortage of capital available when required to maintain the essential competitive position of the wholesale markets and to keep them abreast of modern trading requirements, including environmental engagement and health and safety.

Increased efficiency in food distribution (encompassing primary distribution, food preparation and catering) can significantly reduce food waste, energy waste and the need for road transport when handled within a dedicated food centre on the lines proposed—alternative fragmented approaches become constrained by small scale complexity and do not have the mass to address most of the issues of the Public Good.

## 2. The Opportunity

Composite Markets, as envisaged in *The Review of London Wholesale Markets*, included a vision for the future of the wholesale markets. In specifically addressing London's issues, the Review suggested that London's wholesale markets should be consolidated into three Composite Markets. It proposed the establishment of specialist food parks incorporated into the existing wholesale markets. It suggested that the wholesale markets could be developed to attract primary suppliers, specialist manufacturers and distributors focused especially on supplying London's catering and specialist food retailers. It suggested that such a concentration of activity might attract large food companies to mentor and possibly finance SMEs, through an "incubator", ideal for second stage development. In addition the report suggested that it might be possible to set up facilities for catering education, preferably in conjunction with existing catering colleges, and other facilities to enhance and develop the commercial opportunities and public good available through wholesale markets.<sup>73</sup> Ironically a reduction in the number of markets enhances their competitive position by making each market strong enough to withstand external forces of consolidation in food distribution and retailing. Smaller markets, as at present, lack the critical mass to withstand the competitive onslaught of the significantly larger groups in both sectors. The survival of the markets after the rapid rise of the super-markets has been more appropriately attributed to luck in the changes of catering behaviour rather than a result of planning, strategy or foresight.

City Food Centre's concepts are relatively simple—importantly they enhance the relationship between the market, the sources of produce and the procurement agencies, thereby recreating a forum for open and transparent trading and direct and easier access between the parties—this is a major advantage of consolidation and of having food-centric and procurement offices on site.

Subsequent work has developed the potential for the development of integrated food hubs that would provide opportunities for young entrepreneurs to enter the industry, for the effective distribution and consolidated management of local and regional foods, as well as facilities for established players to profitably develop their businesses in providing the opportunity for sourcing consolidated food supplies and food requisites from composite markets. City Food Centres would also provide facilities for the specialist needs of the catering industry, serviced offices for public procurement and general food education. In addition they would provide the environment for the establishment of innovation centres for better understanding and enjoyment of food as well as the development of more focused opportunities for local and regional foods.

## 3. Recommendation

The main recommendations included in the 2002 Review remain the foundation on which this summary submission is based. It must be a policy objective of government to support the development of a more effective and environmentally sustainable non supermarket distribution for the South East of England. This is particularly of importance to encourage SMEs and the production and distribution of local and regional foods. It is pleasing to see that some of the ideas included in the Review being taken up outside of the South East. It is also gratifying that, after several in-depth discussions over the past four years between CFC and the Covent Garden Market Authority, a number of the core ideas promoted by CFC have been adopted or are informing the tender process of the CGMA with regard to the redevelopment of NCG. However, it is recommended that if an effective alternative to fragmented distribution to specialist shops and catering establishments, which represents significantly over 30% of the food and drink consumed in the South East, is to be conjoined with the possibilities of benefitting from centralised catering and food education and innovation, improved distribution of local and regional foods and provide incubator opportunities for new young start ups in the food industry, government should review and implement the key findings of the 2002 Review. These recommendations and subsequent submissions include the removal of monopoly rights

<sup>73</sup> Key findings Appendix 1. Not printed.

that prevent the development of Composite Markets. Such enlarged and one stop markets would allow for both commercial and social enterprise development of conjoined City Food Centres as presented in detail to the Covent Garden Market Authority in April 2006.

In the context of securing food supplies for 2050, in addition to the increased output of agriculture, it is suggested that more effective distribution would be of significant benefit in terms of efficiency, sustainability, innovation and the encouragement of more SMEs in production and distribution of British food.

January 2009

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**Memorandum submitted by the British Veterinary Association (BVA) (SFS 20)**

**INTRODUCTION**

1. The British Veterinary Association (BVA) is the national representative body for the veterinary profession in the United Kingdom and represents circa 11,000 members. Our chief interest is to protect and promote the interests of the veterinary profession in this country and we therefore take a keen interest in all issues affecting the veterinary profession be they animal health, animal welfare, public health or employment concerns. Issues associated with food security are very much on BVA's agenda. The BVA Congress in September 2008 had as its theme "Veterinary surgeons in a Changing Environment".

2. We welcome the opportunity to present our view to EFRACOM on its inquiry into "Securing Food Supplies up to 2050: the challenges for the UK". The consultation has been considered within the BVA and the response which follows is primarily based upon comments received from our Veterinary Policy Group and the BVA's response to Defra's recent consultation on "Ensuring the UK's Food Security in a Changing World".

**EXECUTIVE SUMMARY**

3. The BVA welcomes the consideration being given to food security by Defra and others and the identification of the range of major issues impacting on food security at local, European and global levels is generally good. However, we believe that there is not enough consideration given to disease control and biosecurity, both of great relevance to the efficiency and sustainability of the livestock industry. We are also concerned by some of the assumptions made by Defra regarding the level of food security the UK currently enjoys.

4. This response calls for:

- Greater investment in the UK's long term agricultural infrastructure so that more people seek to become farmers and rural veterinary surgeons than seek to give up.
- More targeted veterinary research into disease control and other aspects of livestock health and welfare.
- More investment in research into sustainable food production in the UK. The emphasis should be on local and regional cycles of production, reducing the transportation of food and waste.
- Improvements to the stringency of border biosecurity.
- Food associated industries and the broader economy to develop policies and procedures to mitigate climate change to minimise disruptions to crop and livestock production.
- Greater emphasis to be given to increasing UK food production and the benefits of local and regional food production by reducing regulation and bureaucracy. Small businesses intent on producing, processing and marketing food locally to be encouraged.
- Redoubling of efforts to educate the public about the value of food, good nutrition, food preparation skills and reducing food waste.
- Food security to be acknowledged as a public health issue to ensure the UK population has access to sufficient, safe and nutritious food at an affordable price. BVA has a valuable source of expertise in the Veterinary Public Health Association (VPHA).
- Additional indicators are needed focussing on animal disease risks and UK's self sufficiency.

## RESPONSES TO QUESTIONS RAISED

*How robust is the current UK food system? What are its main strengths and weaknesses?*

5. BVA believes that Defra's view in its consultation paper overstated the current level of food security enjoyed in the UK given current global instability, volatile oil prices, the current economic crisis, and the forecast growth of the world's population by 2050. One has only to remember the rapid and huge surge in wheat prices, for example, when oil rose to \$140 last summer or the recent dispute between Ukraine and Russia over gas. Oil may not return there for some time but any surge in oil or shipping costs will rapidly impact on imported food prices. While there is international political instability the aim of global food security is unlikely to be achieved and so emphasises the importance of home-grown supplies.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

6. There should be greater investment in the UK's long term agricultural infrastructure. At present, while the Government supports the FAO global food production targets, it has not adopted them for the UK. The UK has the potential to contribute to the FAO targets, but research is needed to identify which types of food production, given our climate and soil types, can be increased sustainably. Those increases can only be achieved by market forces but we need to think of ways to promote them.

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

(a) *The science base*

7. A major part of securing and increasing UK food production is protecting it from disease. There should be more targeted veterinary research into disease control and other aspects of livestock health and welfare. Funding for veterinary research, including research into the control of disease, has remained static, and in some cases decreased. Even areas in which funding has been maintained at existing levels have in effect been cut back in real terms as the operational costs of research and development grow. Increasing pressure on budgets will mean only core research and development responsibilities would be upheld and increasingly stringent criteria would have to be met. This contrasts with some of our European partners like Germany who are committed to funding research into animal health.

8. Surveillance by veterinarians and through bodies such as the Veterinary Laboratories Agency provides early warnings about possible disease threats to the food chain, and also makes controlling those threats successfully far more likely. As well as ensuring there is a sufficient veterinary presence in rural areas, thought must be given to how best to insure information from veterinary surgeons and farmers is incorporated into ongoing food strategy planning.

9. There should be more investment in research into sustainable food production in the UK. The emphasis should be on local and regional cycles of production, reducing the transportation of food and waste. £1 spent locally returns far more locally than £1 spent in supermarkets but a good compromise is local sourcing in supermarkets.

(b) *The provision of training*

10. Modern veterinary science focuses on health and production planning. The veterinary profession is ideally placed to deliver training to producers in the science of sustainable farming. On a broader front, the degree of debt that graduates have influences their choice of employment to the detriment of the rural food production sector. Incentives such as offsetting or "buying off" debt if new graduates work in certain areas should be considered.

(c) *Trade barriers*

11. Increased trade with an increasing number of countries presents a challenge on the disease control front. Trade liberalisation has many benefits and, certainly, a diversified food supply is a factor in ensuring food security. However; increased trade in livestock and unprocessed foodstuffs increases the UK's vulnerability to disease and pest infestation. Therefore, biosecurity protocols governing the entrance of freight into the UK must be sufficiently stringent to ensure risks are minimised.

12. While trade in animals and animal products presents the greatest risk, veterinary colleagues who visit the UK from abroad comment frequently on the lack of visible border controls at airports. One suggested approach to improve those controls is to introduce more stringent airport biosecurity protocols, with signage warning visitors of the impact of bringing in exotic foodstuffs, amnesty bins for their disposal, and legislation allowing for spot fines for those who ignore the warnings and do not utilise the amnesty option.

*(d) The way in which land is farmed and managed*

13. Mitigating climate change is vital. As well as the disruptions to crop and livestock production that would result from any significant increase in global warming, increased average temperatures would also make the south of England in particular more habitable for mosquitoes, midges and other disease spreading insects. As such, it is important that every effort be made within food associated industries and the broader economy to minimise global warming. In many cases, veterinary surgeons and veterinary research can assist farmers in developing techniques to limit the environmental impacts of livestock farming. The increased risk of novel insect life bringing new diseases into the country also further emphasises the necessity of proactive veterinary surveillance.

14. Disease control and biosecurity are essential components of a food security policy. Foot and Mouth disease is a prime example of a disease that can exert a huge impact on animal health and welfare, animal movement, our ability to feed ourselves and to export meat and foodstuffs as well as environmental impacts from high culling rates and wastage. Bovine tuberculosis also exerts a huge drain on farming productivity and profitability and BSE is an example of a disease process that resulted in a marked loss of confidence in food safety and security. Minimising the likelihood of such diseases being introduced by way of effective biosecurity protocols and minimising their impact by way of effective veterinary surveillance and treatment is essential.

15. The decline in rural veterinary presence is a problem, as veterinary surgeons play a major role in almost every aspect of food security, from fighting disease, to advising on efficient production techniques and minimising the environmental impact of farming practices. They also play a vital role in educating farmers about scientific and regulatory developments in the industry and as a source of corporate knowledge in the British agriculture sector. Long term sustainability for food production is reliant on the knowledge and expertise not just of farmers but also veterinarians.

16. Falling farm incomes and significant reductions in the value of livestock have resulted in farmers being increasingly reluctant to call upon the services of their veterinary surgeon. This sustained downward pressure on the demand for large animal veterinary services is having two significant consequences.

- (a) Many veterinary practices are increasingly finding that the provision of veterinary services to farmed livestock is no longer financially viable, making it difficult for farmers in some regions to secure veterinary cover.
- (b) Farm animal practice and mixed practice is increasingly becoming less attractive to veterinary graduates. This is aggravated by the increasingly large debt with which graduates are encumbered, making them seek employment with high remuneration.

17. More consideration for increasing UK food production is key. We are currently significantly reliant on imports. With a growing population and shrinking workforce, simply maintaining current production will present considerable challenges. Given that local and regional production make disease control easier and contribute to better animal welfare and environmental and economic benefits, working to increase farm efficiency and production is seen as vital. Some supermarkets are already starting to source, display and label locally and regionally sourced goods produced to high welfare standards. This trend should be encouraged.

18. While access to foreign foodstuffs is important for ensuring a diversified food chain in the face of production or supply disruption, the environmental impact of transportation of food from other countries must be measured against production within the UK. Importation of food and livestock has many risks including:

- (a) introduction of exotic disease,
- (b) increased costs of policing imported foods,
- (c) increased surveillance for food safety and disease,
- (d) reduced economic viability of UK agriculture; and
- (e) wider effects on rural communities and the environment.

19. Veterinary surgeons play a major part in efforts to maximise production both by advising farmers on new husbandry and care techniques and by monitoring on-farm disease issues and advising on best disease control. Lost production days in all sectors of livestock production effect farm outputs and, as a result, food supply.

20. In increasing food production, animal welfare standards must continue to be pursued and improved. They must not be sacrificed to improve “efficiency”.

21. The issue of cost-sharing is also of ongoing concern. Given both the current economic environment, and the desire to enhance the UK’s food security, the imposition of costs upon farmers should be considered very carefully against the benefits. Any unjustified added financial burdens could result in costs being passed on to consumers or, in combination with other rises in the cost of doing business, a move away from livestock farming. Neither scenario is a satisfactory outcome from a food security perspective.

*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

22. The premium paid by many shoppers for “free-range”, “organic” and other similar products suggests that issues of environmentally sustainable farming practices and animal welfare are now incorporated into their perception of a food’s quality. Balancing these drivers against the need for increased production will present a significant challenge to the agricultural sector. Pressure from organic producers to allow relaxation of their standards in a recession should be resisted. A standard is a standard.

23. Efforts to educate the public about the value of food, good nutrition, food preparation skills and reducing food waste must be redoubled.

24. Small businesses intent on producing, processing and marketing food locally should be encouraged.

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

25. Food security is also a public health issue. Priority should therefore be to ensure that the UK population has access to sufficient, safe and nutritious food at an affordable price. This would include a range of initiatives, from education about the importance of nutrition and how to prepare affordable, nutritious meals to the establishment of systems to trace food from origin to shelf.

26. As a key part of the agricultural sector, veterinary surgeons have an integral and evolving role to play in food security. BVA has a valuable source of expertise in the Veterinary Public Health Association (VPHA) and other Divisions.

27. Veterinary surgeons filter and report surveillance data, and interpret the implications of surveillance output for their clients. They also play a vital role in:

- (a) providing an information and education service to farmers on behalf of Government;
- (b) advising on improvements to husbandry and biosecurity procedures;
- (c) safeguarding farm animal welfare;
- (d) reducing the impact of animal production systems on the environment;
- (e) advising on the responsible use of veterinary medicines; and
- (f) providing a public health service by advising on risks to people from animal pathogens.

28. However, it is important to note that veterinary surgeons in practice, as well as farmers, food wholesalers and retailers, operate as part of private businesses and it is not ultimately their role to ensure national food security. It is for the Government to engineer market conditions that make ensuring UK food security a by-product of a prosperous business environment for these relevant sectors.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

29. Defra’s recent consultation and the policy processes that will follow are seen as an indicator that the Government is making a commitment to addressing the issues associated with food security. However, the areas identified by the BVA in this paper should be more fully addressed.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

30. Defra’s proposed food security indicators cover many of the core issues at the heart of food security, but they are not as comprehensive as they might be. As already suggested, issues of biosecurity, surveillance and disease control could be more prominently placed.

31. Additional indicators could include:

- (a) tracking and identification of illegal imports or exports of foods (e.g. bush meat);
- (b) tracing and advance warning of disease risk;
- (c) active surveillance for zoonotic diseases and potentially damaging production animal diseases in particular; and
- (d) consideration of the “grey” economy of illegal food trade.

32. It is also suggested that more emphasis be given to the degree of the UK’s self-sufficiency as an indicator of food security.

## CONCLUDING REMARKS

33. The issues of disease control, public health, production levels, farm efficiency and the minimisation of farming's environmental impact make up an important part of food security. They are all also areas in which the veterinary profession can and does play an important role, emphasising the importance of targeted research, surveillance, and retention of rural veterinary numbers. BVA will continue to work through its specialist divisions and with other industry bodies and Government in contributing to the future security of the UK's food supply.

BVA

January 2009

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**Memorandum submitted by the University of Reading (SFS 21)**

*To the Environment, Food and Rural Affairs Committee*

1. We are pleased to accept the invitation to contribute in writing to the above inquiry as a University that has a wide range of activities that potentially contribute to the security of food supplies up to 2050. We were recently ranked 8th in terms of world agricultural research institutions (Appendix 1)<sup>74</sup> and have a breadth of expertise including agricultural science, horticulture, food science and technology, soil science, consumer behaviour and marketing, and agrarian development worldwide. Similarly, in the recent Research Assessment Exercise, the University of Reading submitted 93.1 Full-Time Equivalent research staff in Agriculture and Food.

2. Our response covers two of the requested areas, the science base and the provision of education and training, as these constitute part of our core business. Despite the University of Reading's maintenance of a strong land-based research capability, the inquiry needs to be aware of the closures of research facilities elsewhere across the UK over the last three decades. Such closures have not occurred solely in the public-funded sector, but also occurred in commercial agricultural science research. Indeed, a great deal of agriscience business in the UK is now represented by multinationals based outside the UK. Many such multinationals do not operate significant agricultural science research activity within the UK (although dissemination activities do continue), and even for those that do continue some of their research activity within the UK the majority of significant investment decisions are taken well beyond our shores. This is not a criticism of such multinational companies. Indeed, the university works well with several multinationals in relation to each of research and training. However, DEFRA and other UK government departments may have limited influence on the strategic research direction of these major players.

3. The University's Faculty of Life Sciences is particularly concerned about the future availability of both UK research scientists and in relation to leadership in the land-based sector that will ensure our competitiveness and ability to explore new options to ensure the sustainability of food supplies in the medium to long-term, within the UK and beyond. This issue may become more serious comparatively rapidly, because the greatly-diminished supply of young agricultural scientists over the last decade or more has not yet been especially visible to society at large because traditionally agricultural scientists have a commitment to their subject throughout their working lives. Accordingly, the availability of researchers in the agricultural sciences has remained comparatively high. This has been a function of the demography of agricultural scientists, whereby large numbers were trained in the several decades after the Second World War. Many of that post-war generation of agricultural scientists have retired (or were compulsorily early retired) but have continued to contribute to agricultural science and its dissemination by working as (often self-employed) consultants. I suggest that that generation's substantial contributions will now diminish rapidly and quickly as they seek to retire fully.

4. In relation to new recruits into areas that will ensure food security, the University of Reading continues to run undergraduate programmes in a wide range of areas of great importance to food security and to continue to attract well-qualified students on to these programmes. However, recruitment of well-qualified students with Science A Levels (etc) onto such programmes is difficult because of: (a) the reduction in the popularity of science in many schools; and (b) a less flattering image of agriculture within society in general, and especially amongst young people, compared to the immediate post-war period.

5. Another supply of agricultural scientists and leaders comes from those who study pure science first degrees, such as biology, and who then study applied Masters level programmes relevant to food supply and sustainability. Again, the University of Reading has a range of offerings in this area—although it is increasingly difficult to encourage high-quality graduates on to these programmes. This has led over time to the withdrawal of our MSc programmes in the areas of, for instance, Crop Physiology, Plant Breeding and Animal Science.

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<sup>74</sup> Not printed.



6. In the several decades after the Second World War, government (e.g. the MAFF postgraduate scheme) and industry (e.g. the MMB research studentships) funding supported three-year agricultural and food postgraduate research studentships substantially. These two particular schemes, and many similar ones, ended some time ago. Limited funding does remain available, but is a fraction of that available previously. If there were a single, positive, outcome possible from your inquiry then we would suggest that you examine closely the erstwhile MAFF postgraduate scheme for the agricultural sciences (which in my opinion was very successful) with a view to DEFRA resuming this activity. Your analysis might well indicate that it would be justified solely from the point of view of both DEFRA's and the FSA's future agri-food science staffing needs from 2015, or earlier, onwards.

7. Finally, may we also suggest that you treat any data on numbers in education or training in the agricultural sciences with a degree of caution, simply because it is often not sufficiently detailed. For example, a student studying equine management is less likely to contribute to food security than one studying agriculture. However, the national data available (e.g. "land-based studies") tend not to discriminate at this level of detail.

*Professor Richard Ellis*  
Dean, Faculty of Life Sciences  
University of Reading

*January 2009*

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### **Memorandum submitted by the Crop Protection Association (SFS 22)**

#### EXECUTIVE SUMMARY

Crop protection plays a vital role in helping to ensure food security.

The use of crop protection products helps farmers to grow a reliable, abundant supply of high quality, safe, affordable food. Without them the UK would become more dependent on imported food.

With the increasing cost of research and development and the demands of the regulatory system it is becoming more and more difficult to discover new crop protection products and bring them to market. Farming and associated industries operate in a global marketplace and unwarranted constraints on the use of pesticides in the EU and UK will put us at a competitive disadvantage and so threaten our ability to maintain local production.

We need to keep as wide a range of crop protection products available as possible to enable farmers to manage pest resistance and to help provide solutions to new pest problems that will develop with climate change. It is important to ensure that regulatory decisions and any further restrictions on the use of pesticides are based on evidence rather than politically motivated.

1. The Crop Protection Association represents companies involved in the manufacture and supply of plant protection products for use in agriculture, horticulture, forestry, amenity areas and gardens. We have 23 member companies, covering more than 90% of the UK pesticide market with sales of £500 million.

2. Technology is key to increasing food production in the UK and elsewhere. Advances in mechanisation, fertilisers, plant breeding, crop protection and potentially biotechnology all play a role.

3. Crop protection is essential to ensure that crop yields are maximised. Without protection we would lose more than 40% of crop yield pre-harvest and a further 10% post-harvest. Currently pesticides (herbicides, insecticides and fungicides) are the main and most effective means of crop protection. They play a vital role therefore in ensuring a reliable, plentiful supply of high quality, affordable food, ie food security.

4. Talking about food security, Hilary Benn said on 6 January 2009 at the Oxford Farming Conference:

*"I want British agriculture to produce as much food as possible. No ifs, no buts. And the only requirements should be first that consumers want what is produced and, second that the way our food is grown both sustains our environment and safeguards our landscape."*

We agree with this. There is an increasing demand for home grown produce. In order to meet this demand, pesticides, used in a responsible way in conjunction with crop rotations and cultural controls in an integrated crop management system, are a key part of sustainable farming in the UK.

5. Mr Benn also said:

*"We could produce more fruit and vegetables here in the UK—the market is there, so what is holding us back? If there is a demand then production should follow."*

This suggests that, although he has been "arguing against the pesticides regulation which could hit yields by limiting the crops that can successfully be grown in the UK for no recognizable benefit to human health", he does not fully understand the challenges faced by growers in the UK.

6. As a result of the EU review programme for pesticides under directive 91/414/EEC, around 60% of active substances in the EU were lost due to the prohibitively high cost of generating new data required. This led to gaps in the products available for use on so-called minor crops (i.e. virtually anything other than cereals).

7. This situation is likely to be exacerbated by the proposed EU Regulation on the Placing of Plant Protection Products on the Market which is nearing final agreement. At a time when there is so much concern about food security, we believe it is irresponsible to introduce legislation which could make it more difficult to produce food in Europe and whose impact has not been properly assessed.

8. The whole food chain in the UK has been calling for a thorough EU-wide impact assessment of the proposed Regulation. The Prime Minister and Defra ministers have supported this (see attached correspondence)<sup>75</sup> but have been unable so far to obtain support from their counterparts across Europe.

9. In the absence of an EU-wide assessment of the impact of the proposed hazard cut-off criteria in the Regulation, two impact assessments were conducted by the UK Pesticides Safety Directorate (PSD).

10. In its most recent assessment (December 2008) (<http://www.pesticides.gov.uk/environment.asp?id=1980&link=%2Fuploadedfiles%2FWeb%5FAssets%2FPSD%2FRevised%5FImpact%5FReport%5F1%5FDec%5F2008%28final%29%2Epdf>), PSD found that up to 14% of the pesticide substances assessed could be removed by the criteria in the common position of the Council adopted in September 2008 but much depends upon the definition of endocrine disruptors which is uncertain. This loss of products could make it difficult to grow certain crops in the UK and so make us more reliant on imports. In addition it reduces the range of substances available for resistance management and limits the potential solutions available to deal with new pest problems arising from climate change.

11. The question has been asked “why doesn’t the industry just find more new products?” Unfortunately it’s not that simple. Companies commit heavily to research programmes but it takes nine years and £150 million to research, develop and register a new pesticide. This long lead time makes it difficult to respond to changing needs and the high cost means that companies focus on major crops in order to recoup their investment.

12. Companies must also have a predictable regulatory system to give them the confidence to make such major investments. Therefore legislation such as the proposed Regulation which introduces new and undefined regulatory criteria poses a threat to the introduction of new products. Whilst it will not help us in this particular case, we welcome Hilary Benn’s statement at Oxford that he is “*working hard in Europe to try to get the principles of better regulation recognized and implemented*”.

13. Once a crop protection product is authorised for sale, it is important that it is used properly. We therefore support measures which reduce risk and promote responsible use. Use reduction targets, which are proposed as an option in the EU Sustainable Use Directive soon to be agreed, achieve neither.

14. Under good agricultural practice, pesticides should only be used when they are needed and in the amount required to do the job effectively. Imposing arbitrary reduction targets just makes it more difficult for farmers to control pests and to avoid the development of resistance. Risk reduction is achieved by focussing on how the products are used not how much.

15. We strongly support the measures under the Voluntary Initiative (VI) to promote responsible use and minimize any impact of pesticides on the environment. Some of these measures will soon be enshrined in EU legislation under the Sustainable Use Directive e.g. sprayer testing, operator training and we hope that the Government will recognize the VI schemes as meeting the Directive’s requirements in these areas.

16. There has recently been an increasing emphasis in Defra policy on alternatives to pesticides. Whilst it is important to consider all options to secure our food supply, we feel that there should not be a presumption against pesticides.

17. Synthetic chemistry will remain an important tool for farmers and growers for the foreseeable future and we need to ensure that we have:

- a predictable, transparent, science-based regulatory system to encourage innovation;
- investment in work to develop suitable solutions to enable continued production of fruit and vegetables in the UK (including the use of existing pesticides); and
- responsible use within an integrated farming system.

Crop Protection Association UK Ltd

January 2009

<sup>75</sup> Not printed.

## Memorandum submitted by Covent Garden Market Authority (SFS 23)

### SUMMARY OF RESPONSE FROM COVENT GARDEN MARKET AUTHORITY

- Covent Garden Market Authority (CGMA) is the statutory corporation responsible to Defra for the ownership and operation of New Covent Garden Market (NCGM) in Nine Elms, Vauxhall, London.
  - NCGM is a wholesale market and the largest fresh produce market in the UK.
  - CGMA welcomes the opportunity to respond to this inquiry and asks that the committee considers the important role that markets play in food security in the UK.
  - Wholesale markets provide the alternative food supply chain alongside the better understood food manufacture or multiple retailer routes. Nationally there are 27 wholesale markets with a joint turnover of around £4 billion. Within this NCGM plays a significant role acting as the crucial link between producers, wholesalers, processors and the catering outlets.
  - Consumer demands for food are changing and greater interest is being shown in the quality and provenance of food. As a result the means by which consumers' access food is diversifying which in turn has added benefits to local communities in terms of economic, environmental, social and regeneration gains. Markets are in a central position to benefit from these changes and in turn help producers increase food production in the UK.
  - *Recommendation 1:* Markets provide a great number of benefits to producers, consumers and the community in which they operate and awareness of this needs to be increased. For producers markets mean another outlet for their quality produce (not just their seconds) and by acting as existing food hubs they can increase producers' access to a wide range of customers. These and other benefits also need to be recognised by Government and Local Authorities who should be encouraged to provide more consistent support to markets.
  - *Recommendation 2:* This enquiry should build upon and extend the work being carried out by the National Association of British Market Authorities (NABMA) to understand the economic benefits of all markets so that future policy makers both national and local can take this fully into account.
  - *Recommendation 3:* The length of payment period required by the food service sector and its impact on the small and medium sized businesses within the supply chain should be looked into further. By encouraging the Public Sector to set the standard by ensuring their suppliers pay within reasonable terms it should provide additional support to food producers.
  - CGMA requests the opportunity to present oral evidence (from the perspective of a wholesale market) to the Committee on the points and recommendations set out in this response.
1. Covent Garden Market Authority welcomes the opportunity to contribute to the Environment, Food and Rural Affairs Committee inquiry into securing food supplies up to 2050: the challenges for the UK.
  2. The response addresses both parts of the Committees inquiry, the challenges the UK faces in increasing food production and the actions that should be taken to meet the challenges.

### BACKGROUND

3. Covent Garden Market Authority (CGMA) is the statutory corporation responsible to Defra for the ownership and operation of New Covent Garden Market (NCGM) in Nine Elms, Vauxhall, London.
4. NCGM is a wholesale market and the largest fresh produce market in the UK, supplying quality fresh produce, both food and flowers, to restaurants and hotels, cafes and bars, schools, hospitals and work places as well as independent retailers and a wide variety of retail markets in London and the South East.
5. Wholesale markets provide the alternative food supply chain alongside the better understood food manufacture or multiple retailer routes. Nationally there are 27 wholesale markets with a joint turnover in excess of £4 billion. Together they directly employ over 10,000 people.
6. As a wholesale market NCGM plays a significant role acting as the important link between wholesalers, processors, catering outlets from which the end users consume their food and the producers. As a result of this wholesale markets are in a unique position to measure changes in both producer trends and those of the consumer.

### CHANGING TRENDS IN FOOD CONSUMPTION

7. Consumer interest in food has increased, particularly around the quality and provenance of the food. This has led to a rapid rise in the outlets from which consumers purchase their food, from more local convenience stores to farm shops.

8. Farmers Markets are one such example which has seen a rapid rise in custom and there are now over 800 farmers markets throughout the UK specialising in locally grown produce. Another outlet for producers is the increase in food box delivery schemes which offer sustainably sourced and grown produce delivered to customer doors each week.

9. This increased interest in local, regional or seasonal produce is not just based on environmental or ethical concerns but also a greater awareness of supporting local economies combined with increased interest in health and convenience.

10. A recent report by the Institute of Grocery Distribution has shown that consumers are more likely to support local purchasers than organic or fair trade in the current economic climate. This desire to buy local is feeding through to supporting local shops and street markets where consumers are looking not only for better value but a more human retail experience. It is this sector that is dependent on wholesale markets for their supply.

*Recommendation 1—Increasing awareness of the benefits of the alternative supply chain of markets among producers and policy makers*

11. Wholesale markets play a critical role in the food supply chain and with their strong links to independent retailers, retail markets and food service outlets can help producers and the overarching objective of increasing food production.

#### BENEFITS TO PRODUCERS

12. Today Wholesale markets are undergoing a resurgence after a period of decline, evolving to meet their customers' needs. It is no longer the case that they are an outlet for poor quality/rejected from national multiples produce. Serving independent and street markets as well as the food service industry, the quality expected by these customers means that the standard of produce sold in wholesale markets is at least as high as that in the national retailers, if not higher due to the shorter supply chains.

13. As a result they provide a valuable additional or alternative outlet for producers. The volume and the price may not always be guaranteed (they are not always with supermarkets) but it is possible to make reasonable margins and sometimes even better margins across a whole season through the wholesale market system.

14. This means that producers can send quality produce to the wholesale market and receive good returns (and increase the volume of food available) rather than it go to waste.

15. Using wholesale markets as an outlet for their produce can aid producers by playing an important role in smoothing fluctuations in supply caused by changes in demand (sometimes driven by poor promotional management in a retailer) or supply (the natural variation in outputs).

16. The requirements of the food service sector and independent retail are different to those of supermarkets. For example, caterers prefer larger heads of brassicas as these offer better value once prepared for service. At community level, independent retailers are best placed to meet their customers' demands for specialist food, whether that be ethnic, organic or local. Wholesale markets have the flexibility to meet these varied needs and provide an essential outlet to producers growing "non-standard" produce.

17. However it is important that producers establish good relationships with wholesale markets to ensure they are able to use them when they need it as wholesalers will not secure good customer bases and good prices for product that only turns up in extremis.

18. In addition some growers may be wary of the national retailers, may not have the volumes to meet their demands or may only be starting up with a particular range or variety and are looking for alternative routes to market. Wholesale markets provide that alternative route as both small volumes and small producers can be catered for through the wholesale markets. This is particularly important for smaller producers and those looking to develop niche products.

#### BENEFITS AS A FOOD HUB

19. Food hubs are often mentioned as needed to assist small or local producers to access customer/markets. These do not need to be new facilities as hubs exist already in the wholesale markets.

20. Wholesale markets serve as local hubs, providing a central location for producers to deliver their product to and from where that product is distributed to independent retail or food service outlets. As a result the wholesale markets become the door to the customers.

21. As the largest fresh produce market in the UK, NCGM is best placed to help local producers access the large number of customers within London and the south east. Rather than approaching individual end users—a time consuming and resource intensive approach—by delivering to the Market which acts as a local food network they are able to access numerous customers in one delivery and also possibly open new business leads.

## BENEFITS TO LOCAL AUTHORITIES AND CENTRAL GOVERNMENT

22. Local Authorities should be encouraged to recognise the benefits markets bring to the local and rural economy and support the redevelopment of the wholesale markets and the huge potential markets have to deliver Government social and economic policy.

23. Supporting such local businesses and food outlets provides added benefits to local communities in terms of economic, environmental, social and regeneration gains.

24. Many of these benefits were included in “A Guide to London Wholesale Markets” published as part of the inaugural London Markets Month in October 2008 and can be applied to Markets across the UK.

25. For markets to function efficiently, and therefore be easy and effective for producers to use, infrastructure issues on wholesale markets need to be addressed. Many wholesale markets are now facing redevelopment programmes to replace and improve the infrastructure meeting modern food handling requirements.

26. Government responsibility for markets and the food supply chain also needs to be simplified. At present too many different government departments have an impact upon markets and their operation, making it extremely difficult for market operators to have a consistent approach to running markets. This should also be reflected at local government level.

27. The businesses that make up the markets and work with the producers also need assistance in terms of training provision and encouraging new businesses and individuals to the market. However, there is no specific sector skills council responsible for wholesale market which makes it harder to raise skill levels and attract new people into the trade.

28. Producers also need to develop awareness of communication and marketing within this supply chain. Some of the good operators have their own brand just for wholesale markets, produce is properly packed and labeled—it becomes recognised within the trade and establishes its own demand profile. Some other British produce unfortunately comes to market in plain boxes, or other products’ boxes (English apples in New Zealand apple boxes) with little or no indication of where it has come from or what it is. British produce therefore does not maximise the potential demand for local produce through this alternative food supply chain.

*Recommendation 2—Undertaking research into the importance of Markets*

29. The importance of markets to the food supply chain is currently underestimated and overlooked and more needs to be done to understand and promote the critical role they play in the UK’s food system.

30. To harness the potential of retail markets the benefits they provide (some of which are set out above) need to be better understood. Support for the Knowledge Database work being carried out by the National Association of British Market Authorities (Nabma) would significantly help in better understanding the true level of markets’ impact on local trade and employment.

31. The work done by the Food Chain Centre has done much to expose areas of inefficiencies and promote best practice within the retail supply chain. This work needs to be replicated within the independent or alternative supply chains, whether that be into street markets and small shops or food service.

32. This inquiry should build on and extend the work being carried out by the National Association of British Market Authorities (NABMA) to understand the benefits of retail markets so that future policy makers both national and local can take this fully into account.

*Recommendation 3—Addressing payment periods in the food service sector*

33. Specifically understanding the economics of markets and addressing payment periods payments within the food service sector would also assist food businesses and therefore food production.

34. A key risk amongst wholesalers is business failure due to cash flow problems. Many producers have history of not being paid by businesses which have gone under at short notice. Part of the solution is providing proper business advice and support to the SME’s that make up wholesale markets, but these SME’s are often exposed to harsh payment terms by their customers.

35. It is usual in the food service sector for payment by hotels, restaurants and contract caterers to be much longer than 30 day. 45 days, 60 days and even 90 days are not unheard of. This is on a product with a short shelf life. This burden on the cash flow of SMEs therefore flows all the way down through the chain to producers.

36. Public bodies, who already are committed to best practice such as that laid out in the CBI Code of Practice for payments to creditors, could ensure that all their suppliers do the same. Pressure could be put to bear on the hospitality industry not to fund its cash flow by delaying payments to their suppliers.

37. This enquiry should therefore look at the length of payment period required by the food service sector and its impact on the small and medium sized businesses within the supply chain. The Public Sector should set the standard by ensuring their suppliers pay within reasonable terms.

38. CGMA requests the opportunity to present oral evidence (from the perspective of a wholesale market) to the Committee on the points and recommendations set out in this response.

January 2009

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**Memorandum submitted by the Food Ethics Council (SFS 24)**

1. The Food Ethics Council is an independent research and advocacy group that aims to make the food system fairer and healthier from farm to fork. The Council is chaired by a farmer and its members include consumer advocates and leading academic researchers.

2. The Council welcomes the Committee's inquiry and this opportunity to comment. We have limited our submission to four brief points that may be useful to the Committee at this stage in their inquiry, but would be glad to provide further evidence on request.

3. *Strengths or weaknesses?* Ensuring security of supply entails proofing food supply chains against possible threats. Since these are at best uncertain and at worst unknown, resilience depends on diversity. As Defra has emphasised, the UK's supply chains are diverse inasmuch as our food comes from many countries. However, they are anything but diverse inasmuch as they depend heavily on oil and other non-renewable resources, rely on a narrow range of plant and animal breeds, use the same bulk ingredients to produce an array of different products, and rely on consolidated purchase and distribution systems. Our May 2005 submission to the Committee<sup>76</sup> discussed some of these challenges in greater detail and we have since produced publications on specific challenges including water scarcity, livestock production and consumption, and food distribution.

4. *UK or global?* Whether food security is framed primarily as a global challenge or as an issue for the UK has a profound bearing on how policy should support it. The starting point for any global approach must be that our food systems are catastrophically insecure right now—we do not need to look forward to 2050—in that close to a billion people live in hunger. We believe it is morally incumbent on the UK government, and consistent with its commitment to a “one planet” approach to sustainable development, to see food security primarily as a global challenge. Taking such an approach requires the UK to get its own house in order, but also means that any credible commitment to improving food security must be backed by a step increase in international development support and by committing the UK to an international development-led stance in international trade negotiations.

5. *Scarcity or injustice?* Decades of research and intervention to address food insecurity globally have underlined that it is more fundamentally a problem of injustice than of absolute scarcity. This implies that although pressures on supply will increase and government has a pivotal role to play in helping to meet those demands sustainably, the front line in promoting food security is actually to help manage demand. This is as true in the UK as it is internationally—the difference internationally is that many of the poorest “consumers” derive their economic entitlements from agricultural production. For the UK this implies a policy focus on: managing demand by improving welfare provision and public health intervention to tackle food poverty; and managing supply by introducing fiscal and regulatory measures to protect the workers, the environment and natural resources, and investing in innovation to cater sustainably for changes in demand. These points are elaborated in our publication on the Food Crisis.<sup>77</sup>

6. *Science or innovation?* Just as concentrating on a “supply push” for food might increase production with improving security, so a “supply push” on science is unlikely to deliver the innovation to underpin sustainable and secure food systems. This is the message from the International Assessment of Agricultural Knowledge, Science and Technology for Development (IAASTD), directed by Prof Bob Watson, now Chief Scientific Advisor at Defra. As the largest, most rigorous and most inclusive assessment of its kind ever, dwarfing any process past or planned in the UK, it deserves to be taken very seriously. The UK government must invest more to support sustainable innovation in agriculture and supporting the science base is a crucial part of that; however, unless it radically overhauls that science base such investment would be squandered from the point of view of ensuring food security. One part of the challenge is to make basic science more independent, cushioning public interest research from the pressures of intellectual property markets. The other part is to invest more heavily in problem-driven research—in a sense less independent—driven by the needs of target beneficiaries such as farmers pioneering sustainable production and management systems, and consumers experiencing food poverty. These points are discussed further in the IAASTD report ([www.agassessment.org](http://www.agassessment.org)), in “Just Knowledge?” report and in submission to the Royal Society.

January 2009

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<sup>76</sup> Environment, Food and Rural Affairs Committee's Fourth Report of Session 2006-07, *The UK Government's "Vision for the Common Agricultural Policy"*, HC 546-II, Ev 176.

<sup>77</sup> Not printed.

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**Memorandum submitted by the Institute of Food Research (SFS 25)**

## SUMMARY

*Environment and Rural Affairs Committee—2009.*

This document represents the Institute of Food Research's view on the issues affecting the security of food supply from the point of view of the consumer and the food industry rather than the issues affecting primary production. The key challenges are:

- Maintaining consumer choice and expectation for low-cost food.
- Ethical food production with minimal environmental impact.
- Maintaining the safety of the food chain and consumer confidence in it.
- Understanding and influencing consumer attitude and behaviour.
- Ensuring the industry is equipped to deliver.

It is our view that food security is a complex interaction between basic production, food processing, the consumer, energy and global warming and that these issues cross the current departmental and research council boundaries. An integrated approach is required between the potential funding bodies to ensure the integration of research required to understand and address the issues which cannot be considered totally in isolation.

*How robust is the current UK food system? What are its main strengths and weaknesses?*

1. The UK's current food system is around 60% self-sufficient, with the balance dependent upon the importation of a wide range of foods from across the world to provide the UK consumer with cheap and plentiful food supplies, reduced seasonality and tremendous diversity. This is both its strength and its weakness. There is a wide range of choice but supply is highly dependent on importation and transportation costs and environmental impact is high.

2. The supply system is highly dependent on supermarkets and "just in time" distribution vulnerable to any internal or external perturbation of the transportation network or supply system.

3. Although potentially the UK could become self sufficient in food from the calorie point of view, it is unlikely that this policy would be able to maintain the consumer expectation for price and choice. However, consumers will become increasingly aware of the impact of this policy in particularly third countries as well as the carbon footprint associated with the distribution network. An increasing proportion of consumers are likely to demand a reduction in this footprint and expect food to be locally sourced, however, a significant proportion of people will not be prepared to pay a premium for this local production. A considerable change in social habits would be required if this policy of increased reliance on local sources was to be implemented.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

4. The UK has some of the world's leading centres in climate change, crop development and research throughout the food chain. The Norwich Research Park (NRP) in particular has international expertise in crops (John Innes Centre, JIC), environmental sciences (University of East Anglia, UEA) and food, including consumer sciences and waste reduction (Institute of Food Research, IFR).

5. The NRP is particularly well placed to lead on the development of new crops for increased productivity and drought resistance. However, since 30–50% of food production is lost post-harvest part of the challenge should be met by setting targets for industrial waste elimination. Consumers are becoming aware of this wastage and will be expecting measures to be taken to reduce it and clearly there are benefits to be had in terms of overall sustainability and security if wastage can be substantially reduced. Again this will require not only a change of attitude from consumers but also improved processes in the food industry which will be required to produce the healthy convenience foods, with reduced waste production and with lower energy inputs. The issues affecting processing in terms of minimal processing plus the continued sourcing of foods from across the world will require considerable investment in research into emerging pathogens in order to ensure continued security and confidence in the food chain.

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

- *soil quality*
- *water availability*
- *the marine environment*

- *the science base*
- *the provision of training*
- *trade barriers*
- *the way in which land is farmed and managed*

6. Soils and water quality will clearly affect productivity but the quality of soil and its mineral balance will also impact on micronutrient availability. Should there be substantial changes in where crops are produced there may be unexpected impacts on nutritional values and even processing characteristics. This may require the development of new varieties or changes to farming practices.

7. There has been a decline in Defra's funding of research related to agriculture, food and fisheries over many years, with negative impacts on the research base and infrastructure including Research Council institutes, such as IFR. This in turn impacts on the food industry's ability to plan forward for change. The "delivery pipeline"—from basic and strategic research through more applied work and into practical application by industry—needs to be strengthened.

8. A continued supply of skilled natural and social scientists will be essential to meet future challenges, both to sustain the research base and for the benefit of the economy more widely. IFR is an important contributor, hosting significant numbers of research students in relevant topics in underpinning sciences. Additional support for this role would be welcome.

*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

9. There will be an increasing demand for healthier foods, those lower in fat, salt, sugar, for foods with added benefits from, phytochemicals and natural products. A proportion of consumers will be prepared to pay a premium for these. It is also likely that consumers will increasingly accept genetic modified foods if they are perceived to deliver health benefits or are thought to help alleviate the world food problem. In relation to these areas, considerable consumer and social research is required to understand the motivations of the consumer and to help drive social change that may be necessary if world food supplies become restricted. Because of the concerns for animal welfare and impact on local populations of world trade as well as the need for locally grown produce, there is likely to be increased consumer interest in traceability and labelling and the provenance of food although there has been some funding, particularly from FSA in support of traceability methodology, there will be a continuing need to invest in this area.

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

10. Defra originally underpinned the development of what has now become the IFR's "Food and Health Network". This is a national free-to-join network which hears about best practice and networks to horizon scan on food issues. The "offspring" of FHN is FHN Direct (working confidentially 1:1 with companies including company visits and discussions) and, most recently following industry requests, the establishment of IFR Extra means that the food industry can now access leading-edge science to tackle its short-term, urgent problems.

11. Funding from Defra to assist in developing the relationships and the service delivery would be a sensible use of low level resources to help ensure the food industry is fit-for-purpose.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

12. We welcome the establishment by Defra of the Council of Food Policy Advisors, although in our view it would be strengthened if its membership included additional scientific expertise.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

13. No comment.

January 2009



**Memorandum submitted by the British Pig Executive (BPEX) and the English Beef and Lamb Executive (EBLEX) (SFS 26)**

HOUSE OF COMMONS ENVIRONMENT, FOOD AND RURAL AFFAIRS COMMITTEE  
INQUIRY, “SECURING FOOD SUPPLIES UP TO 2050: THE CHALLENGES FOR THE UK”

BPEX and EBLEX are the English pig sector and cattle and sheep sector subsidiaries, respectively, of the Agriculture and Horticulture Development Board. BPEX and EBLEX focus on increasing the competitiveness and efficiency of English pig, cattle and sheep levy payers through applied research, knowledge transfer activity, market intelligence, and domestic and export market promotion.

EXECUTIVE SUMMARY

1. The Government argues that self-sufficiency is not a complete measure of food security. Nevertheless, the reasons behind falling self-sufficiency in some sectors, including the cattle, sheep and pig sectors, are worthy of reflection. Defra’s food security discussion document fails to recognise the weak economic state of the UK livestock industry and the threats to its long-term competitiveness and sustainability and, consequently, to its long-term ability to meet domestic food needs.

2. The cattle and pig breeding herds, and the sheep breeding flock are all falling as a result of low profitability, low producer confidence and lack of investment over many years. A continuation of these trends will mean falling domestic production, increased imports, and the “export” of our industry to areas where production standards and—in the longer term—production capability may be lower than in this country. A greater reliance on imports is neither conducive to food security nor to consumer choice.

3. Within the red meat industry, there is already in place a substantial foundation of scientific and technical knowledge on which significant improvements in productivity and production can, in principle, be made over the next two decades or so. The realisation of much of the country’s production potential largely lies in the hands of the industry itself, but a necessary condition for this realisation is effective knowledge transfer activity. This is a substantial challenge.

4. Other challenges in the livestock sector include: exotic and endemic animal disease, convoluted and inefficient supply chains, the large retailers’ domination of the food supply chain, the administrative and cost burdens of aspects of legislation and regulation, and, the impact of policy changes. Overcoming some of these challenges lies beyond the capabilities of the meat and livestock industry alone, and highlights the continuing need for greater dialogue and cooperation along the supply chain within the food industry as a whole, as well as for engagement by government.

5. Technical improvements have direct production, competitiveness and environmental benefits.

6. It is vital that the Government maintains and enhances its commitment to research and development. For both government and industry, training is also a critical success factor.

7. The long-term strategic domestic and global food challenges require a focus on “modern” agriculture and the evidence-based appliance of science.

8. Demand for red meat is robust and will continue to grow with population and economic growth.

9. Government has a critical role, not only in ensuring a suitable legal, economic, policy and regulatory framework, but also in helping competitiveness through the rural development programmes, R&D, animal health policy, skills and training, and public procurement.

10. Defra’s proposed indicators of food security should include a meaningful measure of the economic condition and sustainability and production capability of the UK’s food and farming industry, which are important factors in determining the UK’s long-term food security.

INTRODUCTION

11. BPEX and EBLEX welcome the EFRA Committee’s important and timely inquiry into the UK’s readiness to meet the challenges of increasing pressures on global food supplies. Our comments focus mainly on the issues in relation to the red meat industry (cattle, sheep and pigs).

*How robust is the current UK food system? How well placed is the UK to respond to the challenge of increasing food production?*

12. The main thrust of Defra’s discussion document, “Ensuring the UK’s Food Security in a Changing World” (July 2008), is that the UK has always been a net importer of food, self-sufficiency is currently relatively high in historic terms, and that food security is largely ensured through open international markets, good links with a diverse range of stable trading partners, a strong domestic economy, and resilient infrastructure and domestic supply chains. We would agree with much of this general analysis. We would also accept that food self-sufficiency is not a complete measure of food security. But Defra’s discussion

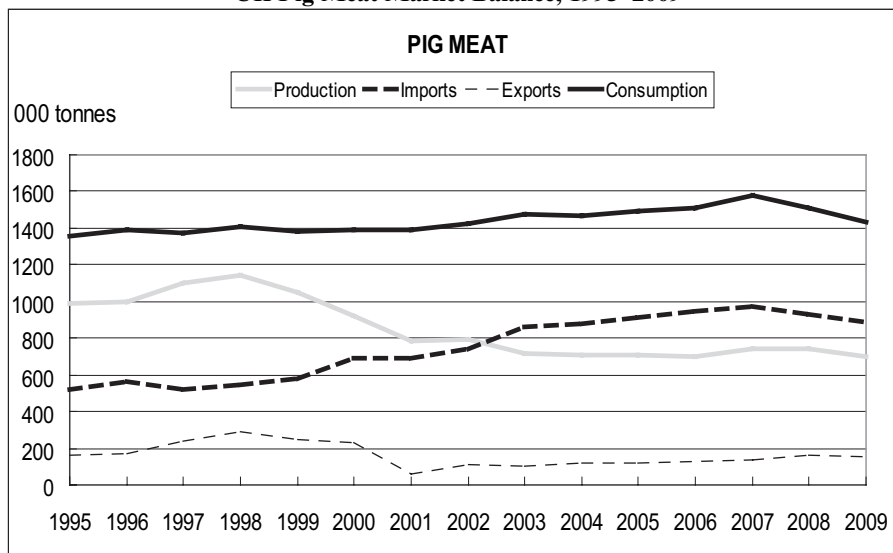
document fails to recognise the weak economic state of the UK livestock industry and the threats to its long-term competitiveness and sustainability and, consequently, to its long-term ability to meet domestic food needs.

13. EBLEX’s latest annual survey of production costs across a range of cattle and sheep production systems in England shows that, in the 2007–08 financial year, average-performing producers (with the exception of store lamb finishers) failed to secure a positive net margin (though the top third performing producers in some production systems did so). In the pig sector, with feed representing a substantial proportion of the total cost of producing a finished pig—reaching 60% during 2008—producers have been particularly exposed to the dramatic increases in the level and volatility of global cereals and soya prices during 2007 and 2008.<sup>78</sup> While UK pig meat production has been falling since 1998, production across the EU has increased.

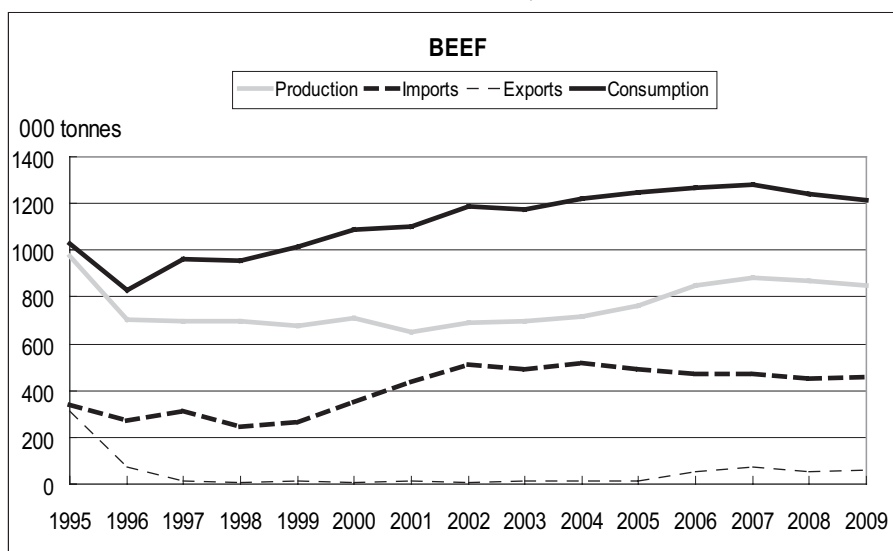
14. As a result of a chronic condition of low profitability, low producer confidence and lack of investment, the dairy and suckler beef herds, the sheep breeding flock and the pig breeding herd are all falling. Despite encouraging signs of an increase in productivity in the pig sector, the logical consequence of a continuation of these trends is falling domestic production, increased imports, and the “export” of our industry to areas where production standards and—in the longer term—production capability may be lower than those in this country. A greater reliance on imports is neither conducive to food security nor to consumer choice.

15. The graphs below show the overall market balances for pig meat, beef, and sheep meat since 1995 (with BPEX and EBLEX forecasts for 2008 and 2009).

**UK Pig Meat Market Balance, 1995–2009**

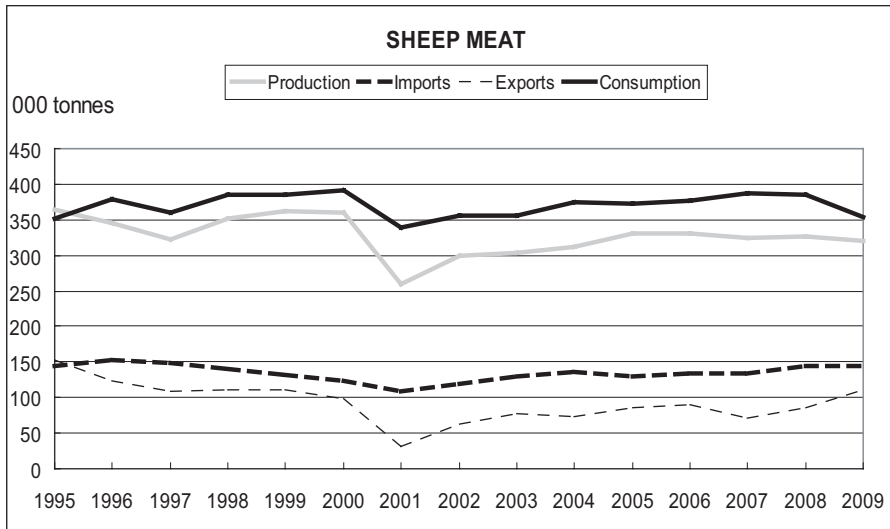


**UK Beef Market Balance, 1995–2009**



<sup>78</sup> The cost of producing a kilo of pig meat peaked at just under 150p in April/May 2008, while the average loss per pig produced was at its greatest, at between £20–25 per pig, in the period January to May 2008. Since then, declining costs and higher producer prices meant that the industry moved back into profit in October. By November 2008 average production costs were down to 128p per kg of pig meat, giving a net profit of £4 per pig.

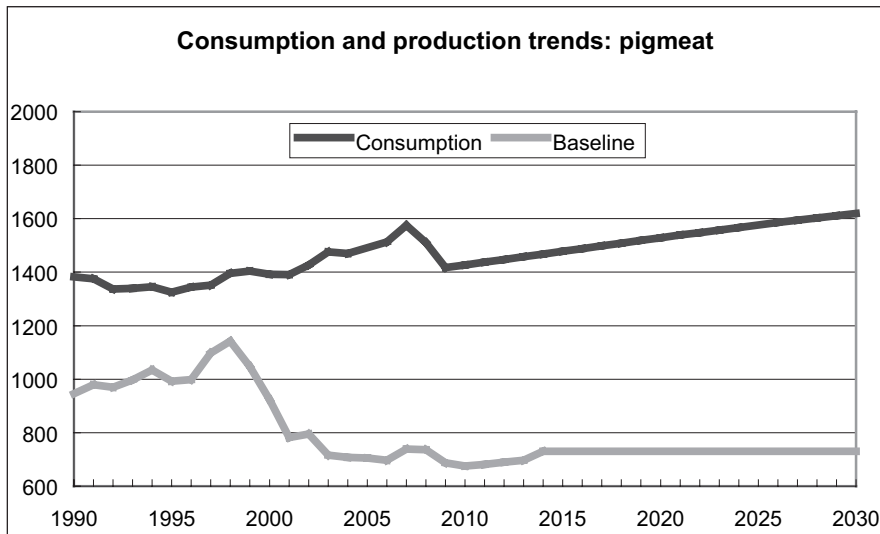
**UK Sheep Meat Market Balance, 1995–2009**



16. The UK’s self-sufficiency in pig meat fell from 73% in 1995 to 47% in 2007, in beef it fell from 109% in 1995 to 79% in 2007, and in sheep meat it fell from 103% in 1995 to 85% in 2007.

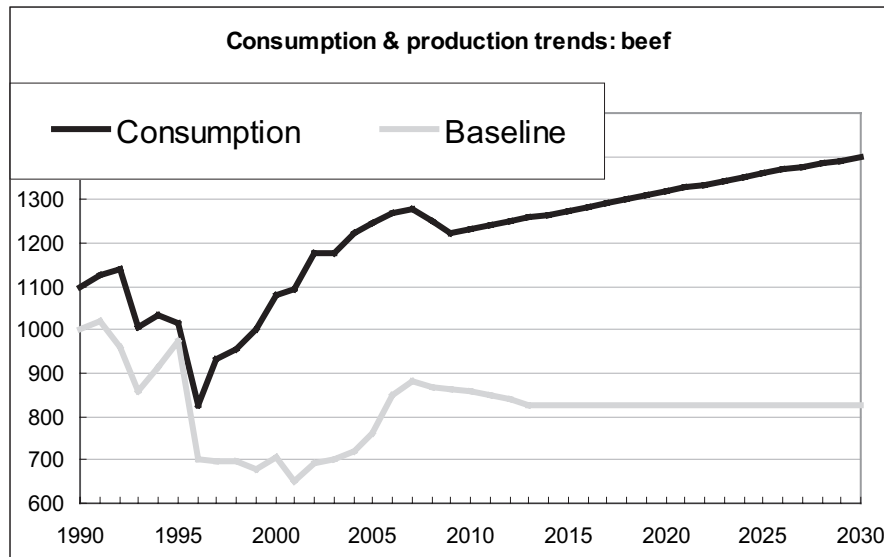
17. Looking ahead, the graphs below indicate the outlook for consumption and domestic production of pig meat, beef and sheep meat to 2030 based on current trends.<sup>79</sup> Current and projected demand for red meat is robust (though the current economic downturn is impacting on the types of cuts being purchased at retail level as some consumers switch to cheaper cuts).

**Pig Meat: Projected Consumption and Production to 2030**

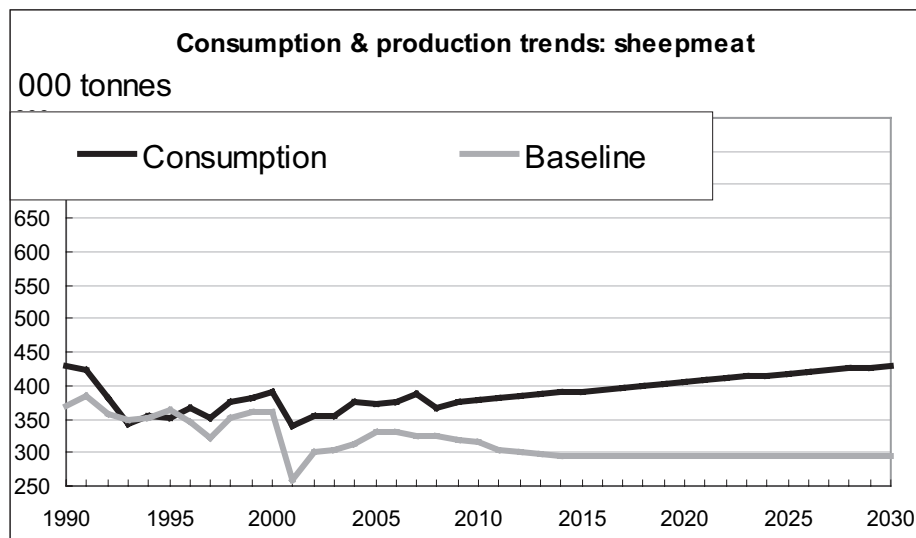


Source: BPEX/EBLEX.

<sup>79</sup> The consumption lines are based on a simple extrapolation of current per capita consumption and projected population growth in the UK. The “Baseline” production curves plot production based on a projection of current trends in production performance, as well as in the prevailing commercial and policy environment.

**Beef: Projected Consumption and Production to 2030**

Source: BPEX/EBLEX.

**Sheep Meat: Projected Consumption and Production to 2030**

Source: BPEX/EBLEX.

18. All three graphs indicate that, on current trends, the UK's ability to meet projected red meat consumption in 2030 from domestic production will continue to decline.

*What are the challenges on the supply side?*

19. Within the red meat industry, in our view there is already in place a substantial foundation of scientific and technical knowledge on which significant improvements in meat and livestock productivity and production can, in principle, be made over the next two decades or so. This knowledge base includes:

- Genetic improvement
- Improved nutrient management (consistent with matching genetic potential)
- Higher productivity (pig/calf/lamb per sow/cow/ewe)
- Higher carcase weights
- Lower mortality
- Higher animal health (including through more effective and collaborative animal disease control)

20. The benefits of achieving these technical improvements include a higher supply of animals for slaughter, better use of abattoir capacity, as well as improved carcase and meat quality. In turn, these improvements should, in principle, also lead to higher returns from the marketplace, greater business confidence and higher investment leading to a more sustainable industry. Improvements in technical performance also carry environmental benefits, including more effective adaptation by the livestock sector to climate change and mitigation of its greenhouse gas emissions.

21. If the realisation of much of the country's production potential largely lies in the hands of the industry itself, crucially, a necessary condition for this realisation is effective knowledge transfer activity that succeeds in achieving the wider uptake and application of that knowledge. Given that the livestock industry—notably in the case of the cattle and sheep sectors—comprises several tens of thousands of small businesses, this is a very real challenge requiring considerable resources.

22. For the pig sector, a key aim is to ensure access to GM animal feed ingredients. In an increasingly GM world, the EU's policy of zero-tolerance towards GM feed imports places it in a position of growing isolation, to the disadvantage of those sectors that are heavily dependent on imported animal feed and feed ingredients. Here, the need is to encourage the EU authorities to improve the regulatory regime for such ingredients. Another major challenge is the continuing effort to improve pig health and welfare.

23. A number of systemic factors combine to challenge the competitiveness and long-term sustainability of the UK meat and livestock industry. These include: exotic and endemic animal disease; convoluted and inefficient supply chains; the large retailers' domination of the food supply chain; the administrative and cost burdens of some aspects of legislation and regulation; and, the impact of policy changes. Overcoming some of these challenges lies beyond the capabilities of the meat and livestock industry alone, and highlights the continuing need for greater dialogue and cooperation along the supply chain within the food industry as a whole, as well as the need for engagement by government. In some areas (e.g. animal disease control, trade policy, tackling climate change), cooperation with other foreign governments and through international institutions is necessary.

24. Looking further ahead to 2050, against a background of a slow-down in the overall rate of agricultural productivity growth, it is vital that the Government maintains and enhances its commitment to research and development. Looking forward to a world that seems certain to be severely challenged by population growth, climate change and accompanying pressures on soils, water and air, it is vital that the seeds of future food production capability are sown now in order to apply and harvest the fruits of that knowledge many years into the future. This research effort should include all aspects of biotechnology, including GM technology, and its safe application in this country as well as in those parts of the world which, on current trends, face the most severe threats to natural resources and agricultural production, largely as a result of climate change.

25. In our view, the strategic domestic and global food challenges require a focus on “modern” agriculture and the evidence-based appliance of science. Such a focus is consistent with ensuring sustainable and competitive food production, food safety, high animal welfare and environmental standards, adaptation and mitigation strategies in relation to climate change, the achievement of healthy and balanced human diets, and consumer choice.

26. In the debate about the future of food production in this country, it is important that otherwise legitimate concerns about diet and nutrition or about climate change in some parts of the world do not lead to assumptions about similar conditions and issues in the UK context, or to simplistic conclusions about meat eating and the necessary size of the meat and livestock production in this country.

27. In relation to the particular aspects on the supply side that the Committee raises, we make the following comments below.

28. *Soil quality.* Soil and water are inextricably linked and should be considered together. Soils are generally well-managed in this country, though there are aspects of managing organic matter that could be improved. The challenges will be to maintain levels of fertility and soil structure. As the costs of essential plant nutrients, normally supplied as fertiliser, rise, this should lead to their more efficient use. A concern is that such nutrients become uneconomic or unaffordable. Falling livestock numbers, together with improved performance and feed utilisation, mean that there is reduced availability of plant nutrients in the form of manures, and correspondingly greater need for manufactured and mineral fertilisers.

29. *Water availability.* There are some concerns about the availability of water in the south east of England. This could be addressed, at least partly, through the construction of more reservoirs.

30. *The science base.* While industry will fund near market research that offers commercial returns, government must continue to fund strategic research, and there is general concern across agriculture as a whole about government's commitment in this area. In the area of collaborative applied research between government and industry, the LINK programmes have been very successful, but their future is unclear until more is known about the planned Technology Strategy Boards. A number of levy organisations, including BPEX, have closed their own research facilities, as has government. In England, there is now no government presence at institute level dealing with livestock. Universities too have closed their agriculture departments and associated research. Food retailers should also be encouraged to support research, since they are the most profitable sector of the food and farming industry.

31. *Training.* Any modern economic sector must ensure the provision and take-up of formal and practical education and training, as well continuous professional development. Offering rewarding opportunities in a forward-looking industry is key to attracting new talent and retaining experienced manpower. The pig sector, in particular, has invested significantly in industry training. However, across government, its agencies and industry, the plethora of bodies and schemes makes for a very complex system. Schemes and their funding need to be simplified. And very often skills development is displaced to attend to more immediate concerns—the “important” is displaced by the “urgent”.

32. *Farming and land management.* This is an area that is strongly policy-driven, notably through the environmental regulation and through the range of agri-environment schemes operated by Defra and the devolved administrations. The Government chose to implement the 2003 CAP reform agreement, including the use of voluntary modulation, in a way that strongly emphasised the environmental dimension of farming. Concerns about future food supplies suggest that there may be a need to alter the balance between the environmental and food production aspects of farming. In particular, there should be as much flexibility as possible to exploit—but within sustainable limits—our most productive lands in the lowlands.

#### DEMAND TRENDS

33. After a very strong 2007, red meat consumption fell back to more expected levels during 2008 although the general trend over time is still upwards. However, economic factors, caused by the recession are expected to influence volume in 2009–10. Whilst some of these will be positive, such as a return to home preparation from ready meals some will be negative (e.g. an expected decline in out-of-home eating). The economic downturn is also likely to influence that pattern of cuts of meat consumed.

34. In the longer term little change is expected in individual meat consumption levels, although movement between species and cuts is likely to occur and meats used in snacking, sandwiches, which cater for the increased need of time-poor consumers, or lighter meals, if predictions of global warming and longer warm dry summers are realised, are likely to be strong. The EU forecasts the UK population to reach 71 million in 2035. As it grows towards this level total UK meat consumption will increase. The ethnic composition of an increased population could change the mix of meat consumed e.g. the Muslim religion proscribes consumption of pig meat, while lamb is a traditionally stronger element of some ethnic diets.

35. Multiple retailers will continue to increase their share of the market although this is likely to slow as the number of independent butcher outlets reaches a sustainable level. It is clear within the multiple environments, that promotion has an ever-growing influence on levels of purchase for any particular cut. This will continue to be a strong driver as meat is regarded as a destination purchase and a strong meat offering will increase customer traffic.

36. Local sourcing, sustainability and animal welfare are all becoming more influential in consumers purchasing habits. Being able to make these claims will become more important over time and of particular benefit to many independent butchers. Whilst some multiple retailers already offer these benefits, it will become increasingly relevant to them to have fully traceable farm, supply chain, local sourcing assurance schemes in place. Without this they risk turning away a substantial number of meat purchasers who will then purchase meat and general shopping at a competitive outlet.

#### DEFRA'S ROLE

37. The Government's key role is to provide a legal, economic, policy and regulatory framework that promotes the effective workings of the market, fosters fair competition and ensures strong infrastructure. As we highlighted in our response to the Defra food security discussion paper, the key role for Defra (and other relevant agencies) is in the following areas:

- Regulation—regulatory regimes (e.g. environment, food safety, animal health and welfare, planning etc) that are risk-based, proportionate and cost-effective.
- Rural development—to promote agricultural competitiveness and modernisation (including support for knowledge transfer and training activity) through the RDAs in England and the devolved administrations in the other parts of the UK. However, each RDA has different priorities, and with differing application procedures, accessing funds can be difficult.
- R&D—maintain or increase funding of long term strategic R&D, including new biotechnologies, and support of collaborative research with industry.
- Animal health—protecting the nation's animal health status, and improving control of endemic disease through cooperation with industry.
- Skills—supporting the development of an appropriately skilled workforce.
- Public food procurement—through a regime that includes quality and animal welfare amongst sourcing criteria.

## MONITORING PROGRESS

38. In its food security discussion document, Defra proposes a range of headline and supporting food security indicators to enable it to assess and monitor the UK's food security over time. However, as we commented in our response to the document, the proposed indicators only go so far. In particular, they do not include a meaningful measure of or guide to the economic condition and sustainability or production capability of the UK's food and farming industry, which, in our view, are important factors in determining the UK's long term food security. In our response to Defra, we suggested that a separate "theme" (alongside Defra's proposals of global availability, UK trade and diversity, food chain resilience, affordability and safety and confidence) might be "UK farming competitiveness", which might embrace the following indicators:

- Profitability
- Investment levels in farming
- Retail price spreads
- Business confidence
- Domestic agricultural R&D spending
- Farmer age profiles and new entrants
- An appropriate measure of farming skills

Some of these measures might have to be established on a sector-by-sector basis in order to take into the account the varying fortunes amongst the different farming sectors over time.

January 2009

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**Memorandum submitted by the National Association of British Market Authorities  
(NABMA) (SFS 27)**

## SUMMARY

The National Association of British Market Authorities (NABMA) represents local authority wholesale, retail and specialist market operators and also a number of private market operators.

NABMA welcomes the opportunity to respond to the Select Committee and asks the Select Committee to consider the following recommendations:

*Recommendation 1*—simplify central government's relationship with retail and wholesale markets by appointing a Minister with responsibility for markets, ensuring that all relevant departments "think markets" when considering policy and legislative change, and have named contacts within relevant departments responsible for liaison and communication with the markets sector.

*Recommendation 2*—support and commission, at central and regional government level, further research into the scale and value of retail and wholesale food markets in the UK.

*Recommendation 3*—promote "alternative routes to market" to strengthen and diversify food access. Specifically these should include developing wholesale markets as local food hubs, and piloting the development of wholesale farmers' markets.

*Recommendation 4*—commission research to evaluate the benefits of a national roll-out of the Bradford wholesale market customer tracking project to help identify potential food deserts.

*Recommendation 5*—support a pilot project for the development of food vouchers as part of the benefits system, to be redeemed on markets.

*Recommendation 6*—consider the option of legislative change to support the creation of a robust and a sustainable food security strategy. This could include specific planning controls in relation to town centres, as well as protection for small businesses/independent producers in relation to having to accept significant changes to supply contract terms.

*Recommendation 7*—consider the introduction of a new monitoring indicator measuring distance travelled/mode of transport in relation to retail food purchases.

NABMA will be pleased to provide further support on any of the issues referred to in this submission.

## INTRODUCTION

1. It is assumed that for the purposes of this inquiry, the Select Committee is using the same definition of food security as that contained in "Ensuring the UK's food security in a changing world" (DEFRA 2008), namely: "consumers having access at all times to sufficient, safe and nutritious food for an active and healthy life at affordable prices."

2. This submission is structured around the three elements of food security—availability, access and affordability, finishing with some comments on DEFRA’s role and monitoring. It focuses on the contribution that markets—wholesale, retail, and specialist (e.g. Farmers’ Markets) can make to securing the UK’s food supplies.

3. Carolyn Steel in her book “Hungry City” states: “Wherever food markets survive, they bring a quality to urban life that is all too rare in the West: a sense of belonging, engagement, character. They connect us to an ancient sort of public life. People have always come to markets in order to socialise as well as to buy food, and the need for such spaces in which to mingle is as great now as it has ever been—arguably greater, since so few opportunities exist in modern life. The success of markets like Borough suggests that we have not lost the appetite for such encounters in Britain...”.

#### AVAILABILITY

4. In relation to food production, we make only two comments:

- According to “Ensuring the UK’s food security in a changing world” (DEFRA 2008) “no single country accounts for more than 13% of food and drink imports.” NABMA supports the principle of maintaining a range of supply sources so that any risk to our total food supply is spread.
- The same document states that: “Currently the UK is 60% self-sufficient in all foods...” It is worth noting that the level of self-sufficiency is in decline, having peaked in the mid-1980s. The degree to which the UK can and should be self-sufficient sits at the heart of the debate on food security, particularly in the context of increased interest in and demand for local food.

#### ACCESS—THE ROLE OF MARKETS

5. Markets have existed for millennia and historically ensured the residents of towns and cities had access to affordable fresh food and other commodities. They have also acted as a key source of retail innovation, creating many of today’s multi-national retailers eg TESCO (Hackney, East London), Marks & Spencer (Leeds), and Morrison’s (Bradford). This innovation is still being displayed today through, for example, Farmers’ and Christmas markets.

6. Food retailing is now highly concentrated—at least two-thirds of sales are accounted for by just four retailers (Cabinet Office—Food Matters 2008). In addition, these companies have created their own supply chains, which have by-passed traditional wholesale markets.

7. There is an historic lack of research and data relating to the markets sector. Although some progress is being made, the need for accurate and up-to-date information is a serious shortcoming and must be addressed.

8. Despite the concentration of food retailing, there are still some 25 wholesale markets in the UK, supporting in the order of 1,000 independent companies, directly employing approximately 10,000 people with a combined annual turnover of about £4.0 billion (NABMA 2008).

9. In addition, the report of the First National Retail Markets Study 2005 (“The Rhodes Study”), which was jointly funded by NABMA and the National Market Traders’ Federation (NMTF), revealed the following headline figures:

- Over 1,150 retail markets are operated within the UK.
- Over 150,000 stalls are available each week.
- The market industry offers employment to more than 96,000 people.
- Over 46,000 market traders work across the UK.
- Over £1.1 billion spent at market stalls each year in the UK.
- The average stall occupancy rates are 75% and falling.
- Over 435 million shopping visits per year.
- Over £125 million turnover by market operators each year.

10. NABMA is sponsoring a PhD studentship (the first to look at retail markets in the UK), which is currently investigating the changing place of traditional food retailing in English retail markets. The results are not yet available, but the study includes developing a national markets database and this is already showing a significant increase in the number of UK retail markets. This is largely due to the growth in specialist markets, including farmers’ markets and “country markets”, which had not been recorded previously.

11. Farmers’ markets, whereby stallholders only sell what they produce/make, are drawn from an area that is local to the market—typically 30 miles, and the principal stallholder is involved in production (so able to discuss farming/production practices with shoppers) were initiated in 1997. Research by the National Farmers’ and Retail markets Alliance (FARMA) in 2008 identified some 800 farmers’ markets across the UK (c.700 in England).



12. They have enabled the return of craft & traditional foods by creating a regular alternative to conventional supermarket food chains. They reconnect farming with their local community and can enable a rural/urban dialogue.

13. Retail markets remain an important part of the retail offer in towns and cities. Research commissioned by the London Development Agency (LDA) in November 2005 to inform the Mayor's Food Strategy, found that customers shopping for food at street markets spend between £3,000 and £15,000 a day in nearby shops, and local retailers, were almost universally supportive of markets.

14. In 2006, the Joseph Rowntree Foundation conducted research on *Markets as social spaces*. It concluded that:

- Markets were important sites of social interaction for all groups in the community, but most significantly for older people, especially women.
- Markets also represent important social spaces for mothers with young children, young people, and families with children, particularly at weekends.
- Markets had a significant social inclusion role, as places to linger, particularly for older people and young mothers. Some markets also appeared to be inclusive of disabled people, although in other places this was less evident.
- There is limited national and local policy to encourage and support markets' role as a key social and economic space for the local community. Markets could play a more significant role in national policy agendas such as social inclusion, town centre regeneration and healthy eating.

15. The role of food markets can be evidenced by many examples of good practice. These have wider application, and are currently being developed as case studies. They include:

- Billingsgate wholesale fish market—the development of a “fish school” that reconnects school children and adults to seafood, and its innovative polystyrene waste recycling facilities.
- Borough, London—an example of the declining market transforming itself through food to become an internationally renowned destination, and integrating wholesale and retail businesses.
- Bradford Wholesale market—introducing customer vehicle licensing/monitoring that allows geographical mapping of independent food retailers and caterers, and the identification of potential food deserts.
- Bristol—in addition to the St. Nicholas Market, located in the historic medieval centre of Bristol there are also a range of other markets which include the Bristol Farmers' Market and the Bristol Slow Food Market.
- Islington Whitecross Street—an example of a London Street market being transformed into a food market through a regeneration project.
- New Covent Garden Wholesale Market—an example of integrating wholesale and retail supply via “Local to London”.
- New Spitalfields Wholesale Market—developed new waste management procedure to increase segregation and recycling of its annual 12,000 tonnes of waste from about 10% to almost 70% in three years—resulting in an international Sustainability Award from the World Union of Wholesale markets.
- Northenden, Manchester—Community Food market introduced in response to “food desert”/ customer demand.
- Stroud Farmers' Market—a weekly market of local food and craft producers that has revived a town centre and has superb community support.

16. It is recognised that today's consumers have more choice, more mobility and higher expectations, and find modern shopping centres/supermarkets attractive and convenient. Their “convenience”, however, may be at least partly due to a lack of alternatives. The resurgence of specialist food markets shows that a market at the end of the street can be both convenient and attractive.

17. In relation to local food, in 2008, The Big Lottery made £60 million pounds available to increase the production, distribution, sale and consumption of local food. Funding criteria meant that local authorities could not directly bid for funds, but could be part of a partnership bid. In the context of markets this raises a number of issues.

18. In 2008, the New Economics Foundation (nef) published a report on *Real Steps Towards Sustainable Food Systems*. It concluded, among other things, that:

- It is problematic to assume that there is a strong or inherent link between “local” and “sustainable”.
- Positive policy intentions are too often not translated into good practice, or where they are, it is often on a very localised scale.

19. It further noted: “Local food is a contentious proposition: do scale and distance between production and consumption alone guarantee quality, affordability, accessibility, health, sustainability? On the other hand, while local food practitioners may not claim that their activities, in themselves, deliver a sustainable future, the motivations behind many initiatives are grounded, nevertheless, in a desire for environmental, health and social improvements...These funds will support the development of more integrated local food infrastructure, while also helping very localised social and community schemes.”

20. NABMA maintains that markets can support the local food agenda in a number of ways:

- Wholesale markets are the source of most fresh produce sold in retail and street markets and are a vital, but under-estimated, link in the overall food supply chain.
- Wholesale markets can be developed as local food hubs linking supply chain production, distribution and retail sale.
- Wholesale markets can act as business incubators for innovative and entrepreneurial food companies.
- Wholesale markets could be used to pilot the development of wholesale farmers’ markets (currently unknown in the UK) to act as alternative, substantial and sustainable business opportunities for food producers that would act as a counter to the over-dominance of the supermarkets. The supermarkets do not always pay the best returns to suppliers, nor do they always offer stable, long-term business relationships. In times of economic downturn, where cost/price becomes paramount, they are more likely to pass the cost of retail discounting down the chain to their suppliers. Creating a diverse and broad distribution and retailing environment could, therefore, better support UK food producers.
- Retail markets are best placed to “take the food to the people”. They can therefore, be used to support the local food agenda directly.
- Retail markets also offer the opportunity to act as employment/business generators by offering relative low-cost and flexible start-up opportunities.
- In their capacity as “community hubs”, retail markets can be used to bring added value—cooking demonstrations, healthy eating promotions etc.

#### AFFORDABILITY

21. The 2008 review of street markets by the London Assembly, identified that “Street markets are important to people as sources of affordable high quality food. A shopping survey undertaken by the New Economics Foundation in 2005 found that in Lewisham a shopping basket of food cost £4.74 from the market compared to a cost of £7.18 to buy the same food from a supermarket.” The NMTF Shopping Basket Survey 2008 also showed that, across a range of thirteen items, markets were on average 6% cheaper than supermarkets, and in relation to fresh produce, markets were 32% cheaper than supermarkets. They are thus in a position to respond positively to the current economic downturn and may not be as badly affected as some other retailers.

22. The average UK household now devotes around 9% of its expenditure to food, down from 16% in 1984. But the poorest 10% of households in the UK saw 15% of their expenditure spent on food in 2005–6 (Food Matters 2008).

23. According to DEFRA’s Family Food Survey 2007, average consumption of fruit and vegetables in the UK is 3.9 portions a day (3.0 portions in 1975). This still falls significantly short of the target of 5-a-day.

24. NABMA recommends that the inquiry considers a pilot project on the introduction of food vouchers as part of the benefits process, which could be redeemed for fruit and vegetables at markets across the country.

25. In July 2008, the Cabinet Office published *Food Matters—Towards a strategy for the 21st Century*. It states: “Street markets can be an important source of affordable, good-quality food including fresh fruit and vegetables. They can be significantly cheaper than supermarkets and so provide access to good-quality fresh food to those on low incomes.” It also states: “The success of farmers’ and specialist markets and large

revitalised city markets provide models for greater local engagement with fresh, affordable food and highlight an opportunity to modernise or develop new food markets. Cities and towns can, through their planning and food strategies, support farmers' markets and traditional street markets by:

- identifying sites for markets, especially sites with good links to local transport infrastructure;
- promoting markets and access, and challenging restrictions that limit signage for shoppers about opening times, and
- looking at easing parking restrictions near markets to increase access.”

26. Despite this, the role that markets (farmers', wholesale and retail) can make to the governments' food strategy and its obesity strategy (Healthy Weight, Healthy Lives) in terms of food access, food security, local food, effective and efficient supply chains, waste minimisation and recycling, education and health promotion appears to be significantly underestimated.

#### DEFRA'S ROLE

27. The Markets Policy Framework 2007, produced by the Retail Markets Alliance and launched by the All Party Parliamentary Markets Group (APPMG) identified that successful markets contribute to the social, environmental and economic well-being of the nation, by:

- Providing a sense of place.
- Being part of the nation's cultural heritage.
- Remaining an important element of the economy, particularly in relation to independent retailing, local employment and business start-up opportunities.
- Offering local access to fresh produce and other commodities.
- Reducing environmental impacts eg by eliminating excessive packaging/waste.

28. In so doing, markets contribute to the following key areas:

- Regeneration/economy
- Food & health
- Culture & tourism
- Community cohesion
- Environment

29. This, coupled with the regulatory frameworks that markets operate within, means that the following departments all have some link or potential link with markets:

- Department for Business, Enterprise and Regulatory Reform (BERR)
- Department for Children, Schools and Families (DCSF)
- Department for Communities and Local Government (DCLG)
- Department for Culture, Media and Sport (DCMS)
- Department for Environment, Food and Rural Affairs (DEFRA)
- Department of Health (DoH)
- Department for Innovation, Universities and Skills (DIUS)

30. The result of this is that markets remain largely hidden and “off the radar” when it comes to departmental thinking.

31. Two changes should be considered—the identification of a single central government department that takes a strategic and co-ordinating role for markets nationally, and that all departments when considering policy or legislation “think markets”, ensuring effective engagement with the sector. In the context of food security this should be DEFRA.

32. There are still significant knowledge/data gaps in relation to the UK food chain. This is exemplified by the lack of accurate and up-to-date information in relation to markets at wholesale and retail level. In addition, the nef 2008 report noted that “the growing wealth of academic and other independent evidence around food issues is not readily available (financially, physically or intellectually) to many sustainable food advocates, even though it may have been compiled using public funds. The effectiveness of advocacy and campaigning could potentially be considerably strengthened through better access and use of these data and knowledge, especially at a time when ‘evidence-based policy’ continues to be a government mantra...”.

33. NABMA has led the creation of a “markets knowledge base” group to help identify and plug the gaps. DEFRA is urged to support this group by commissioning and funding specific research projects.

34. Several European states and regions (e.g. France, Germany, Catalunya) have introduced specific legislation to protect town centres, mixed retail economies and maintain good food access. One consequence of this has been that wholesale and retail markets continue to play a more prominent role in relation to food provision in mainland Europe than in the UK.

35. In 2008, NABMA and the World Union of Wholesale Markets (WUWM) looked at a number of economic indicators for market—the number of markets, the number of market traders, the number of people employed on markets and the economic (business) turnover of the markets per annum. This is summarised below for a number of EU States:

<i>State</i>	<i>No. markets</i>	<i>Population (Million)</i>	<i>No. traders</i>	<i>No. employed</i>	<i>Gross turnover (Billion € p.a.)</i>
France	4,900	63.8	50,000	20,000	4.75
Germany	3,000	82.2	50,000	150,000	4
Ireland	750	4.2	15,000	20,000	0.89
Netherlands	1,000	16.4	24,000	45,500	3.1
Spain	1,300	45.1	75,000	278,000	5
UK	1,200	60.6	46,000	46,000	1.38
Totals	12,150	272.3	261,000	559,500	19

36. Extrapolating the data for the whole of the EU produced the following:

<i>EU Total</i>	<i>No. markets</i>	<i>Population (Million)</i>	<i>No. traders</i>	<i>No. employed</i>	<i>Gross turnover (Billion € p.a.)</i>
	25,000	495.5	400,000	1,000,000	35

37. Collectively, the retail markets industry across the EU is comparable to a global company such as TESCO.

38. NABMA recommends that this inquiry reviews the option for legislative changes to support the UK's Food Security.

#### CRITERIA FOR MONITORING FOOD SECURITY.

39. In addition to the proposed headline indicator of share of spending on food by low income households, NABMA recommends that the inquiry considers a measure of how far consumers travel for their food shopping. This could look at distance travelled, frequency and mode of transport. This measure would help map food access and distribution (linking to the issue of "food deserts"), and provide some indicative CO<sub>2</sub> emissions data for food retailing from a customer perspective.

January 2009

#### Memorandum submitted by East Malling Research (SFS 28)

East Malling Research (EMR) is the principal UK research organisation supporting the fruit growing industry. EMR was privatised by Defra in 2004 having previously been part of Horticulture Research International (HRI).

The consumption of fruit and vegetables is a key element of healthy diets. Emerging medical evidence is now linking an aging European population with increased rates of cancer, heart disease, type II diabetes and obesity. The prevalence of all of these diseases is mitigated by diets rich in fruit and vegetables (hence the various "five-a-day" campaigns in the UK and other European countries).

Unfortunately the UK's ability to supply itself with fruit, in particular, falls well short of current consumer demand. Consequently only 10% of the fruit consumed in the UK is grown in the UK—the lowest self-sufficiency figure of any agricultural or horticultural category. Of course there are many categories of fruit that cannot be grown in temperate climates, such as bananas and citrus and there are considerations of seasonal availability. However, the fact that the UK only produces, for example, 27% of its requirement for apples and 5% of cherries is not due entirely to seasonality but also to technical and market development.

The UK consumer prefers to buy locally or nationally grown fruit when there is an option. High quality fruit products, including fresh supply, are required to deliver dietary and food additive benefits to an unhealthy population. Sustaining an economic UK-based production platform to meet this demand against a background of climate change and increasing urbanisation is vital. UK based production faces many challenges with respect to both economic and climatic limitations. However, sustainable UK production delivers benefits in terms of control of supply, quality (provenance and traceability), maximal shelf-life reducing waste and less food miles.

The fruit industry requires underpinning R&D to improve sustainability and drive innovation. Improved agronomic techniques, the breeding of improved varieties and the development of post-harvest storage regimes have led to some notable successes in improving the availability of UK fruit. For example, Bramley apples, the main culinary apple in the UK, can now be stored all the year round to ensure continuity of supply. The research on growing and storage techniques that enabled this innovation was completed over

three decades. Home grown strawberries are available from April until late October due to varietal selection and the use of different agronomic techniques. Again, the selection of varieties is the result of a breeding programme spanning 20 years.

Innovation on perennial horticultural crops such as tree fruit and soft fruit requires continuous support over a long period of time for the very obvious reason that trees and fruit canes take a long time to develop. EMR has been working for 10 years on the development of UK cherries that crop in September and October (the UK cherry crop is currently mainly July and early August) but a further 5–10 years of development is required to bring these innovations to market.

In the recent past the long term strategic support required for these innovations was provided by Defra who, since the break-up and privatisation of HRI, are conducting a phased withdrawal from the support of production-focused horticultural research. Unfortunately the timescales, and therefore cost, of perennial horticultural research is well outside the normal criteria for industry investment and a “funding gap” has been created which will lead to ossification of UK fruit growing and a lack of medium to long-term innovation.

In conclusion therefore, we believe that UK food security would be enhanced by intervention and encouragement of the indigenous fruit growing industry. An increase in self-sufficiency of UK fruit growing to say 20% would increase the offering of UK fruit to the consumer, encourage healthier diets and reduce food miles. It is achievable but requires market and technical development stimulated by supporting R&D.

January 2009

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### Memorandum submitted by World Wide fund for Nature UK (WWF UK) (SFS 30)

#### SUMMARY

WWF’s main asks are summarised as follows:

- WWF believes that the Government should support and develop policies to encourage a reduction in domestic meat and dairy consumption and an increase in demand for UK fruit and vegetables.
- The UK should publish a 2050 vision/roadmap for food and land use showing how much energy/food/fibre the world will need by 2050 and the UK’s role in this whilst staying within key resource and environmental limits.
- The UK needs to actively address the issue of embedded water when considering the food system and water issues.
- The UK’s and EU’s fisheries policy needs to be reformed to plan for the long-term so that it is economically and environmentally sustainable. The Government should also support the accreditation of sustainable fisheries (e.g. MSC certification) in the UK.
- There is a need for a regular audit of the national food supply and the supply chain and this should be conducted by DEFRA.
- The UK Government urgently needs a better definition of food security built around sustainable consumption, and the environmental and social performance of supply.

#### *The global food system and the UK*

1. World-wide, food production accounts for the use of 38% of the ice-free land surface. 70% of the water abstracted is used for irrigation. Agriculture and fisheries provide the main income for about 40% of the world’s population. The world food economy directly accounts for more than a third of global greenhouse gas (GHG) emissions. Continued growth in agricultural land and the intensity of production driven by population growth and increased consumption of livestock products is a major driver behind habitat loss and degradation.

2. The UK has about 1% of the world’s population but accounts for about 2% of the world food system on a commodity weight basis.<sup>80</sup> Per capita consumption of meat in the UK is 2.4 times the world average.

#### *One Planet Future and the role of food consumption in food security*

3. WWF-UK is striving for a One Planet Future and has recently launched a One Planet Food Programme aimed at reducing the adverse impacts of UK food consumption—GHG emissions, water impacts within water scarce areas and impacts on biologically diverse places. WWF also helped establish the Marine Stewardship Council and sits on bodies such as the Round Table on Sustainable Palm Oil (RSPO) and for sustainable soy. WWF was therefore pleased that, when responsible for Defra, Mr David Miliband adopted the “One Planet” concept in 2006 as a lodestar for guiding the development of UK food

<sup>80</sup> Based on analysis of FAO data.

and agriculture policy. The changes in global agricultural markets since then have brought the role of food consumption and production into even sharper focus. Due to a range of Government efforts, such as the recent work of the Cabinet Office on food policy,<sup>81</sup> and Defra research such as the Cranfield study of resource use and environmental burdens from production on a life-cycle basis,<sup>82</sup> the UK is now a leading participant in international debate about the role of the food economy in natural resource protection, conservation, and social justice.

#### *Inconsistencies in government policy*

4. From a global perspective, food security is about whether enough food is being produced to meet demand.<sup>83</sup> WWF's principal overarching concern is that Government policy in relation to the security of supply, and economic and environmental performance of the UK food system is supply side focused. The currently widely quoted scenario of the need to double food supplies by 2050<sup>84</sup> is associated with predictions of meat consumption rising from ca 16 kg/capita to ca 30 kg/capita in the developing countries (excluding China and Brazil) compared with 90 kg/capita in the UK today. There has been no real effort on the part of government to address the resource intensity of the UK diet. This gap in policy was reinforced by Mr Benn's speech to the Fabian Society on 10 December, 2008,<sup>85</sup> which ignored the demand side implications of the current western diet. WWF believes that the UK is well placed to lead debate on the demand side across the developed economies, and provide an example beyond with benefits for both the environment and health world-wide.

5. The evidence that the livestock product component of "western" diets is a major factor determining the land use, emissions and resource depletion arising from developed economy food systems is compelling.<sup>86</sup> Resource intense meat and milk based diets draw heavily on global food supplies and set up the market conditions that drive high GHG emissions which in turn contribute to climate change and risks to future food security.<sup>87</sup>

6. The difficulty Defra has on the demand side is clear in the foreword to Defra's Farming and Food Strategy: "Forward Look" which broadly set out Mr Miliband's vision for Defra farming and food policy in 2006:

*"We need to redress the balance and move towards "One Planet Farming"—farming that reflects the need for us to live within the means of the planet, and farming which helps us live within the needs of the planet. Equally, as consumers we all have a role to play, in ensuring that our patterns of consumption respect environmental limits".*

7. The rest of that Defra document focuses on developing a profitable and competitive domestic farming industry which is a positive net contributor to the environment, while reducing the environmental footprint—at home and abroad—of our food consumption. The debate about resource demanding diets based heavily on livestock products is acknowledged but no actions or even aspirations in relation to consumption are set out.

#### *The supply side*

8. Our emphasis on the demand side does not mean that we think that policy on supply is misguided. Defra research that has examined various supply side measures and interactions between customer choice and supply has been beneficial. We discuss this below in more detail in relation to the Inquiry's questions:

*How robust is the current UK food system? What are its main strengths and weaknesses?*

#### *In the global context*

9. Self-sufficiency of around 70% for indigenous foodstuffs and about 58% overall suggests that in terms of global supplies the UK food system is resilient in relation to necessities to all but the most disruptive supply shocks. This however masks reliance on imported farm inputs such as fertilisers, fuel, pesticides and animal health-care products. Moreover, there has been a decline in the production of a wide range of agricultural commodities in the UK since 1990. Production of beef, fruit, vegetables, pigmeat, sheepmeat and potatoes has declined, typically by 20–30%. Total self-sufficiency is declining faster than self-sufficiency in indigenous food reflecting the increase in the consumption of non-indigenous food products. UK capture fisheries and fishing capacity are in long-term decline due to the decline in fish stocks. Reflecting increased

<sup>81</sup> Cabinet Office (2008) Food Matters: Towards a Strategy for the 21st Century.

<sup>82</sup> Williams, A., Audsley, E. and Sandars D. (2006). Determining the environmental burdens and resource use in the production of agricultural and horticultural commodities. Defra project report IS0205.

<sup>83</sup> Defra (2007). Ensuring the UK's food security in a changing world.

<sup>84</sup> Food and Agriculture Organisation of the United Nations (2006). World agriculture: towards 2030–2050.

<sup>85</sup> Bread and Roses: the Politics of Food—A Fabian Society Lecture by Hilary Benn, 10th December 2008.

<sup>86</sup> Gerbens-Leenes W, Nonhebel, S (2005). Research Report: Food and land use. The influence of consumption patterns on the use of agricultural resources, *Appetite* 45 (2005) 24–31.

<sup>87</sup> Murphy-Bokern, D. (2008). The UK food system and the global environment. A report for the WWF UK. [www.murphy-bokern.com](http://www.murphy-bokern.com)

consumption and decreasing domestic production, imports of almost all food commodities rose between 1990 and 2005. This has “exported” the consequences of our buying habits to other countries. GHG emissions, water impacts in vulnerable areas and biodiversity impacts in key ecoregions (for example from palm oil production in SE Asia, soya/sugarcane in Latin America) generate burdens shifted away from the UK. We currently rely on Brazil for 80%<sup>88</sup> of our soy for animal feed and WWF’s research shows that up to 2006, the UK was responsible for 7–10% of the growth of the Brazilian beef industry, which in turn is a very significant driver behind Amazon deforestation.<sup>89</sup>

*In the domestic context*

10. The UK is characterised by vertically integrated supply chains dominated by four huge multiple retailers which control what is offered to consumers and have acquired a very powerful position in the food economy. This dominance has obvious, and, WWF suspects, profoundly negative implications for the resilience of the UK food supply system, particularly when combined with lean logistics and “just-in-time” ordering and delivery and this system has displaced local food chains embedded in more diverse and dispersed producer/retailer networks. However this sophisticated retail system provides opportunities to design supply chains that transmit signals from consumers to producers to influence production practices and decouple the UK food system from environmental degradation, particularly deforestation.

11. The UK Waste Resources Action Programme (WRAP) estimates that UK households waste 30% of the food purchased and that about 60% of the food wasted is edible.<sup>90</sup> 42% of the food wasted by consumers is fruit and vegetables. There is evidence that this level of wastage at the consumer level extends through the food chain and that one third or more of food grown is wasted.<sup>91</sup> Defra research led by Imperial College London gathered anecdotal evidence from manufacturers of chilled foods that indicate that volatility in supermarkets’ order quantities coupled with demand forecast inaccuracies make it difficult for suppliers to estimate material requirements and to plan production. This causes over-supply and waste<sup>92</sup> and ultimately adds to the environmental burdens arising from the food system.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

12. The UK and the rest of Western Europe cover one of the most productive agricultural regions of the world. In addition, the North-east Atlantic is one of the world’s great fisheries. The UK’s food system is sophisticated and the Government has helpfully participated in a public debate in the UK that could be beneficially replicated in other European countries and North America.

13. The UK can ensure through Government leadership and trade that the key tenants of sustainable development are upheld within the food industry and that equitable prices are paid, and workers rights and the environment are respected.

14. The UK could become a leader in responding to the challenges of a changing food system by creating a 2050 vision/roadmap for food and land use showing how much energy/food/fibre the world will need by 2050 and the UK’s role in it whilst staying within key resource and environmental limits.

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

*Soil quality:*

15. The EU Soil Framework Directive is driving much of the UK’s current soil protection policy.<sup>93</sup> The role of the Directive in leading UK soils policy reflects a lack of a strategic leadership in the UK to soils and resource protection generally, compared to other European countries. The UK approach to the nitrogen cycle is fragmented, brigaded and driven by the need to address the various emissions from it (nitrous oxide, ammonia and nitrate) rather than to conserve nitrogen through systems approaches. The same applies to phosphorus which in the long term is the key and irreplaceable nutrient determining agricultural productivity.

16. The negative impacts of soil erosion due to inappropriate land management have become increasingly apparent. Factors responsible for this include animal and crop production on inappropriate land, bad timing of agricultural practices and degradation of river banks and streams by stock. Soil erosion has significant

<sup>88</sup> Van Gelder, J.W., Kammersaat, K., Kroes, H. (2008) Soy consumption for feed and fuel in the European Union, Report for the FOE Netherlands.

<sup>89</sup> Murphy-Bokern, D. (2008). The UK food system and the global environment. A report for the WWF UK. [www.murphy-bokern.com](http://www.murphy-bokern.com)

<sup>90</sup> WRAP (2008). The food we waste.

<sup>91</sup> Mesure, S. (2008). The £20 billion food mountain: Britons throw away half of the food produced each year. The Independent: 2 March 2008.

<sup>92</sup> Imperial College (2007). Sustainable waste management in the chilled food sector. Defra research project report FT0348.

<sup>93</sup> BERR (2006) Science review of Defra. Annex 6: Soil monitoring case study.

social, economic and environment impacts. In addition to reduced future farm productivity, soil entering freshwater ecosystems can cause major damage, for example choking spawning gravels used by fish. Pollution of water by soil carries phosphates into freshwater bodies and the marine environment, exacerbating the problems of eutrophication. A range of policy options are in place to address soil pollution, including regulatory Instruments, whole farm planning, farmer self-help groups, co-operative agreements and grant aid. The use of participatory techniques in developing natural resource management solutions has proved increasingly successful in recent years, in developing countries, the EU, and Australia.

*Water availability:*

17. Water for agriculture has significant effects on freshwater supplies, through the use of pesticides and fertilizers to the water needed to grow the crops.

18. In the UK the industries which use the most water are agriculture, food and drink. The Food Industry Sustainability Strategy looks at the amount of abstracted water used by companies in their operations but does not look at embedded water. There is a strong policy focus on improving water quality associated with agricultural practice. As with soil, the majority comes from Europe, such as the Water Framework Directive and the Nitrates Directive.

19. Future Water<sup>94</sup> sets out the Government's strategy for the UK water sector. The linking of policy on abstraction, demand and surface water flood protection is welcome but it does not address the wider UK water footprint determined by embedded water. Globally the water footprint of products has to be reduced in order to ensure that there is enough freshwater for the growing population and to protect ecosystems and wildlife.

20. WWF-UK has recently published "Water Footprint: the impact of the UK's food and fibre consumption on global water resources." It evaluated the embedded water in the commodities we consume, fundamental to which is the way food and biofuel production in the UK and abroad drive the over-abstraction and pollution of freshwater eco-systems. Foods with high UK demand and footprints include oil palm, soybeans, coffee, beef, cocoa beans and milk. WWF has highlighted the cost of food imports from the Mediterranean region and how our increased domestic demand for these crops has put undue stress on its water resources and ecosystems and our need to address this.

21. WWF would like to see Defra and the UK Government measure the water needed to meet food security/consumption for the UK, the EU and globally and the implications for UK policy support. WWF would support the UK Government in facilitating dialogue and links (at UK and EU levels) between business and government with regards to the impacts on water sources at production sites. Defra should also ensure UK water resources are managed more sustainably and the degraded ecosystems or rehabilitated or restored, wherever possible.

*The marine environment:*

22. Improved fisheries management is the primary way in which the UK can work towards improving the productivity of its seas and improving food security through its marine resources. In most cases the responsibility for management is shared with other Member States through the Common Fisheries Policy. The UK Government needs to work more actively in remedying the problems resulting from the current policy, which manifest in declining levels of output, degraded ecosystems and declining profitability. To reverse these trends, the policy needs to plan for the longer term by ensuring the UK has an economically efficient fleet which works within a framework delivering a healthy marine ecosystem. Current management is primarily concerned with the short-term profitability of fishers. In addition to reforming the CFP, a robust Marine Act which introduces an ecosystem based approach to marine planning would also help. If implemented correctly, this policy shift is likely to deliver greater yields to producers at reduced fishing effort, which would lead to improved food security for UK consumers, because healthy ecosystems are more productive and resilient to environmental perturbations.

23. The UK is currently a net importer of fish because of the types of fish which UK consumers demand cannot be supplied by the UK fleet. However, this trade deficit could in part be alleviated if consumers varied the types of seafood they consumed. Fish such as mackerel and herring are caught in large quantities and are currently exported. As an added benefit, many of these species are more ecologically resilient than many depleted species such as cod and they are typically caught in fisheries with significantly lower levels of bycatch and impacts to marine habitats. The market can also stimulate demand for sustainable fish. In recent years, the Marine Stewardship Council (MSC) has markedly increased its profile and brand, WWF believes it is the best indication for consumers and fisheries that their fish is sustainable. WWF encourages the Government to support fisheries accreditation schemes as a way of improving food security.

<sup>94</sup> Defra (2008). Future Water. The Government's water strategy for England.



*The science base*

24. In the UK, the last twenty years has been characterised by a lack of direction and degradation in the public research machinery with respect to agricultural development and the ability of the private sector to deliver knowledge and technology in agriculture being over-estimated. It is quite difficult to ascertain what Defra's strategy for agricultural and food science is. The last relevant and coherent articulation of science policy was in 2004.<sup>95</sup> The section on farming and food science predicted the food crisis but also set out the intention to reduce spending on agricultural research in the UK and increase reliance of investment from outside the UK and from the private sector.

*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

25. WWF believes that the Government should support and develop policies to encourage a reduction in meat and dairy consumption and an increase in demand for UK fruit and vegetables. There will be less packaging, a consequence of increased public awareness and reaching peak oil, a move away from perfectly formed fruit and vegetables due to price constraints and less food waste. All part of an increase in demand for food that is seen as meeting the requirements of the concept of eco-nutrition.

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

26. Defra should lead on food security and policy, supported by the department of health and the Food Standards Agency (FSA). Defra should create and deliver a road map for the UK and global food systems and be driving forward the Sustainable Procurement action plan to create a low-carbon resource efficient sector.

27. Defra has gone some way to address the strengths and weaknesses of the UK food system through "Roadmaps".<sup>96</sup> They use life cycle analysis to complete a "cradle to grave" picture of the environmental impacts for a product and highlight areas where efforts can effectively be concentrated to reduce those impacts. This "clean-design approach is welcome in stimulating debate and improvements in sectors with respect to environmental performance of production practices. However, WWF doubts this industry led dialogue will sufficiently address the need for profound system changes in some areas. Defra, alongside industry, could develop a "Green Tractor" for domestic food production by 2010 that goes beyond the current Red Tractor with improved environmental and social standards. Defra's ecosystem services Action Plan should be implemented across local areas to ensure local ecosystem wide solutions on water pollution and the negative impacts on biodiversity are tackled effectively.

28. There is a lack of consumer understanding of food security. Yet experience showed how important food was for morale and how big dietary changes are made more palatable by understanding their rationale. This could be linked to exploration of ways to engage the public in building food supplies.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

29. The UK food policy landscape is complex. Defra leads on food and agriculture. FSA sets and advises on food safety. The Department of Health deals with the consequences of poor diet. BERR leads on relationships and policies towards the retail sector. The Environment Agency (England and Wales), Scottish Environmental Protection Agency (Scotland) and NI Environment and Heritage Service (Northern Ireland) oversee waste, water and air quality legislation. The Department for Transport oversees the motorway and road infrastructure on which the retailers' logistics systems rely. Scotland and Wales have their own food policies. While the regions and local authorities have remits connected to food. DFID, The Treasury, the Department of Communities and Local Government, The Cabinet Office, the Department for Culture Media and Sport, the Department for Education and English Nature amongst others all have food related policies.

30. Defra works on behaviour change, public sector procurement, the sustainable food chain, and has a departmental objective to reduce the global impact of UK food consumption and production on the environment, as measured by a decrease in net GHG emissions from the food chain. WWF suspects that Defra has not reconciled its global sustainable development and climate change objectives with domestic objectives relating to UK agriculture. WWF suspects that parts of Defra remain reluctant to develop policy that is opposed by farm sectors, the livestock sector in particular, and this is getting in the way of policy alignment.

<sup>95</sup> Defra (2004) Evidence and innovation: Defra's needs from the sciences over the next 10 years.

<sup>96</sup> The Sustainable Consumption and Production Taskforce (2008). The Milk Roadmap. Defra website.

31. The recent Cabinet Office report has made a useful contribution.<sup>97</sup> In order to create a coherent strategy the government needs to link the initiatives from other departments and all food related policies and developments should be overseen by one body, Defra.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

32. The criteria should include what people are eating, what percentage of the diet is from sustainable and fair trade sources, how much of the overall diet is meat and dairy, and what are the GHG emissions from the food system.

33. There is a need for a regular audit of the national food supply and the supply chain, conducted by Defra.

34. The UK Government urgently needs a better definition of food security built around sustainable consumption, and the environmental and social performance of supply. It ought to be using a term such as “sustainable food security”. Further research into appropriate indicators should be conducted.

35. This requires bringing existing public and scientific indicators under one policy “roof”. Ecological, carbon and water footprinting should all be utilised in the process.

36. There needs to be specific studies of “at risk” sectors. The fruit and vegetable sectors are prime candidates, currently. Consumption of fruit and vegetables remains below target in spite of a very public and persistent campaign to get people to eat five portions of fruit and vegetables a day. We only grow 10% of the total fruit consumed in the UK and for some indigenous vegetables, production is declining even while imports are increasing. Yet data on production of other than a few specific crops, or about consolidation within sectors, is hard to find.

January 2009

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### **Memorandum submitted by the Agricultural Industries Confederation (AIC) (SFS 32)**

#### AIC SUBMISSION:

*EFRA Committee Inquiry—Securing Food Supplies up to 2050: the challenges for the UK*

#### SUMMARY

AIC represents the UK agricultural supply industry, companies involved in the supply of inputs to producers and the purchase of combinable crops from farms.

AIC holds the view that the UK food system is robust and in the primary chain has worked hard together in recent years to develop independently audited and accredited assurance schemes which have supported a robust system but which have also added transparency. AIC believes therefore that the industry is well placed to respond to the challenges which will arise in the next 40 years.

AIC would place the industry’s access to technology at the heart of future strategy. Whilst certain technologies will be dependent on consumer acceptance there is a wider issue regarding access to technology and a functioning and properly funded agricultural science base. Allied to this government needs to recognise the role played in transferring science knowledge into practical on-farm applications.

Resource protection will play a critical part in securing future food supplies but this has to build on mapping and understanding resources such as soil before interpretation and advice can be generated.

Indicators suggest Northern Europe will be one of those areas most looked to in order to deliver the increased production demands and Defra will be looked to for leadership and in galvanising government departments to balance the food, feed and non-food needs of the future.

#### SUBMISSION

1. AIC is the UK’s leading representational body for the agricultural supply industry. Representing companies involved in the manufacture and supply of fertilisers and animal feeds, the purchase and marketing of combinable crops and the supply of seeds, agrochemicals and feed materials to UK farmers. AIC represents both private and farmer controlled businesses. The annual turnover of member businesses is approximately £7.8 billion.

2. AIC would begin by questioning the factors contributing to the rise in food prices in 2007–08. Studying the data for maize and wheat, two of the most traded commodities, globally, it can be seen that during the period 2000–01 to 2007–08 overall demand for wheat and maize rose by 5.4% and 27% respectively. During

<sup>97</sup> Cabinet Office (2008) Food Matters: Towards a Strategy for the 21st Century.

that same period stock levels fell by 42% and 27% respectively whilst production levels remained relatively static. The absence of any increased production over the period is a natural reaction to a prolonged period of relatively low prices and therefore, we would argue, as important a factor and would help to explain the price reaction to the weather affected harvests in 2007 and 2008.

3. Within the primary chain and through to first processing we would argue the UK has a robust food chain with a high level of transparency being one of its strengths. Transparency is one feature which has allowed the UK industry to lend itself so readily to the development of assurance schemes with their independence of audit operating to internationally recognised standards. It is one of the strengths of the UK system that the development of assurance is now being adopted by a number of other countries, both in the EU and beyond.

4. In common with most other countries in the developed world, the UK has a highly developed agricultural sector which places a strong reliance on the use of science and technology for its advancement. We will return to the importance of the science base later in the submission however there is a considerable concern within the whole of the food industry that the UK Government has not hitherto placed sufficient importance on the maintenance of a strategic science resource and this will have a negative impact on the UK's ability to meet the demands likely to be placed on it with regard to future food security.

5. Sustainable food production is a driver which we believe all UK industry will readily sign up to. A definition of sustainable production must reflect the financial sustainability of those within the industry but we believe this is a concept now fully recognised by policy makers. True sustainability does however also need to recognise the need for the industry to be sustainable against its business competitors. The challenges on improving agricultural output over the next 40 years are clear, as are the expectations being placed on the UK, other parts of northern Europe and North America. Such challenges will only be met successfully through a mature debate on delivering sustainability and an acceptance that environmental evolution rather than preservation is a key part of that process.

6. The challenges from now to 2050 are perhaps put into context by the ISAAA Chairman, Clive James, who is quoted as saying "In the next 50 years, mankind will consume as much food as we have consumed since the beginning of agriculture 10,000 years ago."

7. AIC would readily recognise the role which soil quality and soil management have to play going forward. One of the main issues to be addressed in this area, which is perhaps also relevant, although to a lesser extent, for water quality, is the inherent variability within farms. Through bodies such as the Environment Agency there have been considerable steps taken on soil mapping which we believe will be of major benefit in the years to come. This work must however be supported by the resource and expertise to interpret the mapping data and convert that information into tangible advice for farmers and growers. We believe this is a positive message and would look to Defra to ensure that the structures remain in place for this work to be concluded and its full benefit delivered. The successful understanding and management of soil will be a major factor in the period to 2050 as predictions suggested the loss of around half of all currently cultivated land, globally, through management issues such as over-grazing, excessive irrigation and resultant problems of salinity.

8. Globally it is estimated as much as 70% of food production is dependent on irrigation and current aquifer depletion is running at twice the recharge rate. It is difficult to see how an increasing population, can be fed from roughly the same area of land without even greater pressure being put on the usage of water. Water availability is therefore an issue and we believe governments must explore the whole range of options, technical and others, to determine how we meet this challenge.

9. As one of the organisations behind the creation of the All Party Parliamentary Group on Science & Technology in Agriculture, AIC is a strong believer in the need for a more robust and better funded structure to enable both the transfer of "blue sky" research into applied, commercial situations and greater transfer of R&D outcomes to farm level. The position of agricultural R&D was well highlighted in the House of Lords debate on 20 January, initiated by Lord Selborne, as was the demise of a number of bodies which have had a role to play in the areas previously mentioned. Whilst the Agricultural and Horticultural Development Board (AHDB) can play a role in ensuring effective delivery of new knowledge into practical on-farm application, and indeed some of its sector bodies have a long history in doing just that, it is important to look beyond this to the R&D pipeline for UK agriculture. If the UK is serious about maintaining its position as a food producer but also wishes to see agriculture deliver solutions to some of society's wider issues such as renewable energy, then it must recognise the pivotal role that science plays and support it accordingly.

10. One of the potential weaknesses we would see to the UK food system going forward is that of personnel. The increasing average age of producers has oft been documented but this is a position common across many other parts of the primary agricultural food and feed chain. Our own previous assessments foresee approximately 75% of middle and senior managers retiring within the next decade and there are significant concerns on the availability of successors. With increasing market opportunities going forward, coupled with a continual demand on knowledge and technology transfer, the provision of an appropriate training structure is crucial.

11. AIC welcomes the recent statements by the Secretary of State on the importance of food production in the UK and we have welcomed the pro-science stance taken by the UK in areas such as biotechnology and the recent review of pesticides legislation. We do however share with the rest of the agricultural sector a

sense of frustration that these positive messages are seemingly undermined by Defra's actions to unilaterally impose on English growers production restrictions and constraints. Whilst it is not appropriate to explore this in detail in this submission, it is a suitable example of the confused signals Defra needs to avoid sending out.

12. If the UK is serious about rising to meet the future production challenges, whether that be food, feed or non-food, Defra must play its part in delivering other relevant departments. From an industry perspective we would expect to see Defra giving clear leadership. The UK has a sound productive base which utilises technology in modern production and processing practices. There is a high degree of transparency with assurance offering an independently verifiable check on practice. We would expect to see Defra play its part in extolling the virtues of the UK production system to other EU member states (many of whom are following the UK lead in areas such as assurance). The UK agricultural industry has, perhaps more so than any other part of the EU, turned its face fully to the market in reaction to CAP review and developed a structure to deliver the needs of that market, today and tomorrow. In doing so however the industry and Defra need to be alive to the potential for short term protectionism which may exist elsewhere and which was seen in a number of third countries over the past two years.

January 2009

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### Memorandum submitted by the Royal Society of Chemistry (SFS 33)

#### SUMMARY OF THE SUBMISSION

1. The UK and five European countries together account for over 70% of the UK food supply. The UK food supply is vulnerable to both short and long term changes in climate.

2. There is considerable concern about the "skills gap" as it threatens the productivity of the UK food and drinks manufacturing industries.

3. The UK will be better placed to deal with the challenges of increasing global food production—and the UK's own food security in the future—if it ensures that the science underpinning food production, food sustainability and food security is identified and that the scientific research necessary in these areas is pursued.

4. Research should be undertaken to improve understanding of the chemistry of recycling carbon and nitrogen in soil in order to help maintain sustainable agriculture and reduce emissions of nitrous oxide.

5. Sustaining the UK's water supply is vital to sustaining its food supplies.

6. There is little chance of increasing the global catch of fish in the oceans without further damaging marine ecosystems. The future shortfall in the supply of fish protein must therefore be met by aquaculture (i.e. farmed fish).

7. An understanding of all aspects of the science that underpins the supply of safe and high quality food depends on the maintenance of coordinated research. Food innovation and food safety is crucially dependent on the role and work of scientists and technologists in the food industry.

8. Major barriers to trade and innovation occur when regulations are based on hazard rather than risk assessment. Risk accounts for both hazard and exposure. Substances should not be banned on the basis of intrinsic alone but on the likelihood that they will cause actual harm when used.

9. Minimising inputs (e.g. energy, water) and maximising outputs (e.g. crop yields) can be achieved by the application of technologies such as *in situ* biosensor systems.

10. Public opinion is influenced by the media, education, and advertising and this can produce a preference for one technology over another. Ultimately, consumers are driven by the price of food. Any new technologies utilised to increase food security or reduce pieces must be accompanied by early and effective public engagement.

11. Defra should champion scientific literacy amongst policy makers and at the highest levels of the food industry. Defra and the Council of Food Policy Advisers should draw on the learned societies, professional bodies and the wider scientific community for leadership.

12. A coherent cross-Government food strategy would be welcomed.

13. Armed with excellent data Defra would be in a strong position to advise the UK farming community on best practice and the whole food supply chain should be monitored to ensure that waste is minimised.

*How robust is the current UK food system? What are its main strengths and weaknesses?*

1. Sourcing unprocessed food both domestically and from a diverse range of countries enhances food security. In 2006, 26 countries together accounted for 90% of UK food supply, up from 22 countries in 1996. Just under half of this was supplied domestically from within the UK (49%). After the UK, the leading suppliers were the Netherlands (6.7%), Spain (5.8%), France (3.9%), Ireland (2.6%) and Germany (2.5%), all of whom are members of the EU and close trading partners.<sup>98</sup> With the UK and these five European countries (all in the same temperate zone) accounting for 70.5% of the UK food supply, the food system is vulnerable to both short and long term changes in climate. Global warming will have significant effects on weather patterns, distribution and pattern of rainfall, and consequently crop production (for food and animal feed).

2. The robustness of the UK food system further down the food supply chain is heavily dependent upon the supply of appropriately trained individuals working in the food processing and manufacturing. In the UK, food and drink manufacturing has a turnover of almost £74 billion and value added of £21.5 billion. Exports of unprocessed primary products, at £700 million, are very low, implying that virtually all of agriculture's £14.8 billion output and its 534,000 workforce depend on the UK market. UK food retailers and caterers together employ an additional 2.5 million people.<sup>99</sup>

3. There is considerable concern about the skills gap that threatens the productivity of the UK food and drink manufacturing industries. Over a fifth (22%) of all employers contacted in a survey of 1,200 UK food and drink manufacturers believe that the skill needs within their establishment will change over the next 2–3 years. Half of employers who think their establishment's skill needs will change in this time frame identify technical, practical or job-specific skills as those that will need improving.<sup>100</sup>

4. In addition, a minimum of 56,000 workers are expected to retire from the sector over the next eight years while there are fewer 16–29 year olds available to replace this older cohort. Overall replacement demand for the sector is expected to be a total of 118,000 by 2014.<sup>101</sup>

5. Any analysis of the robustness of the UK food system must also take into account the robustness of supply of water and energy; both are inextricably linked to food supply.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

6. The UK will be better placed to deal with the challenges of increasing global food production—and the UK's own food security in the future—if it ensures that the science underpinning food production, food sustainability and food security is identified and the scientific research necessary in these areas is pursued. The Government needs to develop a comprehensive UK food strategy, which should include identifying any gaps in the scientific research that will be needed in the coming decades.

7. In East Anglia, we have some of the most efficient farmers in Europe. A number of these farmers have been expanding by buying land in Poland, where they have the opportunity of quadrupling yields through the introduction of modern farming practices. EU policies have tended to focus on environmental management rather than food production, but the recent response to the increase in food prices gives an indication of what UK farmers could do with the right incentives. The on-going ban of GM crops in Europe damages the productivity and profitability of our farmers, e.g. GM animal feed is generally cheaper than non-GM animal feed.<sup>102</sup> In addition the recent decision to move to hazard based regulation of pesticides in Europe will have the potential for substantive yield losses.<sup>103</sup>

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:**Soil quality*

8. Maintaining good soil structure is important to ensure high productivity. The yield of crop production is often directly related to the amount of nitrogen and other nutrients available either from natural sources such as nitrogen-fixing bacteria working in symbiotic relationship with legumes or the addition of organic matter (primarily manure) to the soil and applied nitrogen fertiliser.

<sup>98</sup> Defra Food Statistics Pocketbook 2008.

<sup>99</sup> Working for the UK—Our Contribution to the Economy, Food and Drink Federation (2007).

<sup>100</sup> Food and Drink Manufacturing: Skills Needs in the English Regions, Improve Food & Drink Sector Skills Council (2007).

<sup>101</sup> Profit through skills: Sector Skills Agreement for the Food and Drink Manufacturing Sector, Improve Food & Drink Sector Skills Council (2006).

<sup>102</sup> Brookes, G. & Barfoot, P. (2006), Global impact of biotech crops: Socio-economic and environmental effects in the first ten years of commercial use *AgBioForum*, 9(3), 139–151.

<sup>103</sup> Pesticides Safety Directorate Impact Assessment, December 2008.

9. Various approaches have been developed in the past few decades to minimise the environmentally detrimental effects of agricultural production on soil quality. Technologies such as low-till or no-till and the use of cover crops are important. These techniques reduce the demand for energy and water by reducing evaporation, raising the carbon content of soil, improving soil structure, increasing earthworm populations and combating wind and water erosion.

10. Research should be undertaken to improve understanding of the chemistry of recycling carbon and nitrogen in soil in order to help maintain sustainable agriculture and reduce emissions of nitrous oxide, a potent greenhouse gas. However, lack of information on agro-ecology and the high demand for management skills are major barriers to the adoption of sustainable agriculture in the UK and worldwide.

#### *Water availability*

11. To appreciate the impact of water availability on food production it is necessary to consider the total amount of water used. For instance, it takes 1,300 cubic meters of water on average to produce one metric tonne of wheat. This concept, known as virtual water has been defined as “the volume of freshwater used to produce the product, measured at the place where the product was actually produced.”<sup>104</sup> It refers to the sum of the water used in the various steps of the production chain.

12. Figures from UNESCO-IHE Institute for Water Education, demonstrate the average amounts of virtual water in food:<sup>105</sup>

- the production of 1 kg wheat costs 1,300 L water
- the production of 1 kg broken rice costs 3,400 L water
- the production of 1 kg beef costs 15,000 L water

13. The challenges faced in sustaining the UK water supply are therefore clearly directly related to those relating to food supplies. This subject is discussed in detail in an RSC report on Sustainable Water (<http://www.rsc.org/ScienceAndTechnology/Policy/Documents/water.asp>). In recent years, water shortages have become a problem in the South East. Whilst the rest of the UK is currently unaffected, climate change would be expected to exacerbate this problem because of possible changing patterns of rainfall.

#### *The marine environment*

14. The most recent global assessment of wild marine fish stock found that, out of the nearly 600 species monitored by FAO, 25% are over-exploited and 52% are fully exploited. 20% are moderately exploited and just 3% are ranked as underexploited. Most wild fisheries are at or near their maximum sustainable exploitation level, and further increases could cause lasting damage to fisheries and marine ecosystems.<sup>106</sup>

15. There is little chance of increasing the global catch of fish without further damaging marine ecosystems. Just as we have National Parks we need to think about protecting significant areas of the seas from fishing to enable them to recover. Furthermore, there is the potential for ocean acidification to have a significant impact on aquatic life; the RSC contributed oral and written evidence to the House of Commons Science and Technology Committee’s consultation *Investigating the Oceans* which dealt with this subject in more detail (<http://www.rsc.org/ScienceAndTechnology/Policy/Documents/InvestigatingtheOceans.asp>).

16. The future shortfall in the supply of fish protein must therefore be met by aquaculture. Aquaculture is the fastest growing food-producing sector and its growth over the past 25 years has averaged 9% per annum over the past decade. In 2004, 43% of the global fish supply came from farmed sources, with the greatest proportion located in Asia, representing almost 90% of all farmed fish.<sup>107</sup>

17. The growth of aquaculture over the next two decades will involve intensification, improvements in productivity through breeding programmes, modifications of the cultivated organism and feed research to reduce the dependence on fish oil and meal. Water recirculation and aeration technology, coupled with the controlled use of antibiotics, can ease the stress caused by intensive farming; but, unlike treating human or other animal diseases, few drugs are available for treating diseases in fish because of environmental concerns and a relative lack of knowledge about many fish diseases.

<sup>104</sup> Hoekstra A.Y., and Chapagain A.K., Water footprints of nations: water use by people as a function of their consumption pattern, *Water Resources Management*, 21, 35 (2007).

<sup>105</sup> Chapagain, A. K., and Hoekstra, A. Y., Water footprints of nations, Value of Water Research Report Series, No.6 (2004).

<sup>106</sup> Barange M., Science for Sustainable Marine Bioresources, Plymouth Marine Laboratory, Plymouth (2005).

<sup>107</sup> State of World Aquaculture 2006. FAO Fisheries Technical Paper No. 500., Food and Agriculture Organisation of the United Nations, Rome (2006).

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*The science base & the provision of training*

18. An understanding of all aspects of the science that underpins the supply of safe and high quality food depends on the maintenance of coordinated research and expertise in this area. Importantly, research must be both inter- and multi-disciplinary.

19. Research in the biological sciences is increasingly dependent upon inputs from chemistry and the physical sciences. Accordingly, the RSC commissioned a report, "Face to Face: UK Chemistry-Biology Interface" ([www.rsc.org/facetoface](http://www.rsc.org/facetoface)) to provide information on the chemistry community's participation in bioscience research. The report sets out key recommendations for academia, research institutions and funding bodies in the UK for facilitating interdisciplinary and multidisciplinary research in this area and also highlights issues that will be of interest for policy-makers up to the national level.

20. This RSC-IChemE report on sustainable food ([www.rsc.org/thevitalingredient](http://www.rsc.org/thevitalingredient)) shows that progress towards tackling key issues in the food supply chain are dependent on a number of underlying science and technology disciplines including chemistry, physics, biology and chemical engineering. Food innovation and particularly food safety is crucially dependent on the role and work of scientists and technologists in the food industries, in academia and research, in government departments and agencies, in food law enforcement, in local authorities, and in consultancies.

21. Technical skills are essential to maintain safety in the food supply chain and to increase competitiveness. However recruitment into technical, engineering and operational roles is a problem. A skilled workforce must be supplied by forging closer links between food sector industries and universities. Graduates must be made aware of the breadth of opportunities available and possess the skills mix to deliver sustainable solutions. It is necessary to improve the training of careers advisers and the information resources available for secondary school students, specifically regarding the possible career paths open in modern food production. Career opportunities in the food supply chain sector must be promoted through work experience placements, teaching placements, careers events and media engagement.

*Trade barriers*

22. Major barriers to trade and innovation occur when regulations are based on hazard rather than risk assessment. Risk accounts for both hazard and exposure. Substances should not be banned on the basis of intrinsic hazard alone but on the likelihood that they will cause actual harm when used.

23. For example, following the recent decision by the European Parliament (January 2009) to approve new EU pesticides legislation, the Pesticides Directive (91/414) is likely to take effect from 2011, despite the opposition of the UK Government. This Directive moves away from decisions based on scientific risk assessment to hazard based nonapproval ("cut-off") criteria. If these political, rather than science-based proposals do eventually prevail, then there will be further product losses. According to European Crop Protection Association (ECPA) this could lead to the loss of up to 80% of insecticides and 70% of fungicides in the EU, severely impairing sustainable crop protection in Europe.<sup>108</sup> As the UK Government itself acknowledges, this is likely to hit agricultural yields by limiting the crops that can successfully be grown in the UK.

*The way in which land is farmed and managed*

24. Minimising inputs (e.g. energy, water) and maximising outputs (e.g. crop yields) through agronomic practice is essential for effective farming. This can be achieved by the application of technologies such as *in situ* biosensor systems that can monitor soil quality and nutrients, crop ripening, crop diseases and water availability to pinpoint nutrient deficiencies, target applications and improve the quality and yield of crops.

25. The additional challenge now being faced is the drive to utilise this arable land for the production of crops for biofuels. However, concerns have been raised about the true contribution of so-called first generation biofuels in reducing global warming and about the fact that food crops, grown on the same land, are being used in their production.<sup>109</sup> Many see the way forward as the conversion of cellulosic material to ethanol, known as second generation biofuel. This allows use of the whole plant and more hardy varieties, able to grow on lower grade land with fewer inputs. Major opportunities exist for the chemical sciences in addressing the challenge of sustainable crop production in order to reduce competition for agricultural land.

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<sup>108</sup> ECPA urges Agriculture Council to leave farmers the tools they need to protect their crops, European Crop Protection Agency (2007).

<sup>109</sup> Johnson E., and Heinen R., The race is on., Chemistry & Industry, 22 (2007).

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*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

26. The consumer can have a profound influence on technologies that are adopted for animal and plant breeding, cultivation of crops and processing and packaging of food. Public opinion is influenced by the media, education, and advertising and this can produce a preference for one technology over another.

27. A survey in 2006 identified that by far the most important thing for British consumers is the quality of food, with nearly 75% saying it is very important. For just over half of consumers, price is very important. For a third of consumers, a cluster of health, social and environmental issues were very important. These include: appropriate consumption of fats, sugars, and salts; health and environmental impacts of pesticides and other chemicals; fair treatment of workers; and, animal welfare. Interestingly, big environmental issues such as climate change and biodiversity in relation to food production and consumption were only seen as very important by about a quarter of respondents.<sup>110</sup>

28. Some studies have indicated that there is a significant gap between what consumers say they will purchase in hypothetical situations and what they actually buy.<sup>111</sup> In a recent Financial Times survey, 30% of people questioned claimed to take fair trade, animal welfare and environmental issues into account when making purchases, however the market share indicates that only 3% act on these concerns. Ultimately, consumers are driven by the price of food.

29. Any new technologies utilised to increase food security or reduce prices must be accompanied by early and effective public engagement. There must be effective communication of the benefits as well as risks to the consumer and/or the environment, an alternative approach to that adopted with GM in the 1990s. Consumers want high quality, nutritious food at an affordable price in convenient packaging that does not have adverse effects on the environment. They are often bombarded with large amounts of often conflicting information about climate change, the environment, and new technologies in food production and waste disposal; and it is very difficult for them to make balanced judgements.

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

30. The RSC strongly supports the recent creation by the Government of the Council of Food Policy Advisers and believes that this Council should play a major role in the developing the UK's food strategy. It is important that this Council draws on a diverse range of sources to help formulate food policy recommendations, including the scientific expertise available. The RSC hopes that the Council will function in an open and transparent manner and that its reports to Government are made publicly available. As food is rising up the global political agenda, the RSC would like to see regular opportunities for Parliament to debate reports published by the Council, including any annual report.

31. Defra should champion scientific literacy amongst policy makers and at the highest levels of the food industry. This will be necessary for promising technical solutions to be recognised by those with the power to initiate change.

32. Defra and the Council of Food Policy Advisers should draw on the learned societies, professional bodies and the wider scientific community for leadership on science and technology for sustainable and secure food supplies. These groups can work together to provide common guidance, encouraging interdisciplinary research through facilitating dialogue, and promoting informed and balanced debate.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

33. A coherent cross-Government food strategy would be welcomed. The Cabinet Office strategy unit report (*Food Matters 2008*) set out strategic policy objectives for Government, however it is still unclear whether or not this has had a positive impact on policy across Government departments. The Cabinet Office announced it would chair a cross-Whitehall Food Strategy Task Force that would coordinate work across government on food issues. This Task Force would report annually to the Prime Minister and the reports published. No reports have yet been published; it is therefore too early to determine the impact of this on cross-Government food strategy.

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<sup>110</sup> Gribben, C. a. G., M., *Food Labelling: Understanding Consumer Attitudes and Behaviour.*, (2007).

<sup>111</sup> Noussair, C. N., *Do consumers really refuse to buy genetically modified food?*, *Economic Journal*, 114, 102 (2004).



*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

34. The establishment of the much talked about Technology Strategy Board (TSB) “agri-food platform” would be useful in helping Defra to monitor food production in the UK. This platform could be used to set up a series of demonstration farms which would provide some real comparative data i.e. comparing, for example organic agriculture with conventional agriculture, with very high tech agriculture (including GM)—with or without fertilisers and crop rotation etc. A range of parameters could then be measured, e.g. productivity, profitability, carbon footprint, greenhouse gas emissions, fertiliser use, water requirements and on farm biodiversity.

35. Armed with excellent data, Defra would then be in a strong position to advise the UK farming community on best practice to ensure that farmers could increase production of our raw ingredients sustainably.

36. Furthermore, the whole supply chain should be monitored to ensure that waste is minimised—it is said that we currently waste about 50% of what we produce between farm and fork.

January 2009

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### Memorandum submitted by the Association of Convenience Stores (ACS) (SFS 34)

#### ACS EVIDENCE: EXECUTIVE SUMMARY

ACS (the Association of Convenience Stores) represents more than 33,000 local shops throughout the UK. Convenience stores play a vital part in the public’s access to food and in meeting consumer needs. Research undertaken by Ian Clarke of Newcastle University has shown the prevalent food shopping needs of UK consumers and a choice of different types of outlet.

In our evidence we examine; food supply chain, food delivery and local produce. Looking at how these aspects of the market currently function and how they may change proving an issue for food security in the future.

ACS makes the following recommendations to promote long term food security:

1. Implementation of the Competition Commission’s recommendation for the creation of an effective Ombudsman that proactively enforces the Grocery Supplier Code of Practice is vital to food security.
2. A robust and consistently enforced policy to prevent harmful out of town retail developments.
3. Encouraging the public to shop in local shops through sufficient town centre parking, local transport, and developing strong guidance around town centre first planning policy.
4. Develop an action plan to deal with food distribution in the case of a fuel shortage, prioritising supplies to local shops.
5. Better access to information about the local suppliers in their region. As well as advice on stock, display and marketing local produce.
6. Introduce targeted financial incentives to mitigate the initial risk of making a loss when retailers first stock local produce.

*Re: Securing food supplies up to 2050: the challenges for the UK*

1. ACS (the Association of Convenience Stores—Annex 1) represents more than 33,000 local shops and welcomes the opportunity to respond to this inquiry into food security. Convenience stores play a vital part in the public’s access to food and in meeting consumer needs. Research undertaken by Ian Clarke of Newcastle University<sup>112</sup> has shown that the prevalent food shopping needs of UK consumers include the availability of a local shop within five minutes walk and a choice of different types of food retail outlet. It is in the context of these consumer needs that we have made comments to the committee.

#### 2. Supply Chain

2.1. Maintaining a competitive supply chain is crucial to food security in the future. It enables innovation, a flourishing economy of home grown produce, provides thousands of jobs and enables people to access regionally grown food. ACS believes that the interests of producers, retailers and consumers are best served by the presence of open supply chains as well as fully integrated supply chains such as those operated by

<sup>112</sup> “The Economic and Social Role of Small Shops: A Review of the Evidence” by Ian Clarke and Sunid Banga.

major multiple retailers. Open or shared supply chains have the benefit of allowing buying decisions to be made by a multitude of businesses, and allowing small businesses to share in economies of scale to minimise costs for buying and distribution.<sup>113</sup>

2.2. ACS also supports fair and competitive dealings between suppliers and retailers. The Competition Commission (CC) completed an investigation into competition in the grocery sector in April 2008. The CC found that the “*transfer of excessive risk and unexpected costs by grocery retailers to their suppliers through various supply chain practices if unchecked will have an adverse effect on investment and innovation in the supply chain, and ultimately on consumers.*” To prevent this from occurring the CC recommended an extended Grocery Supply Code of Good Practice and an Ombudsman to oversee this.

2.3. However, these measures are under threat because:

- the CC has no power to enforce the Ombudsman and instead has to get voluntary agreement with the main supermarket groups;
- the CC has stated that if no agreement is reached then it would recommend to Government to impose the Ombudsman through legislation, but
- Government have been equivocal about what they will do if a recommendation is made.

2.4. The creation of an Ombudsman would in part address the abuse of buyer power found by the CC. However, supermarkets are trying to convince Government, the media and politicians that the Ombudsman will limit their ability to keep food prices low for consumers. This is not true; the costs of an Ombudsman are small, estimated at around £2.5–£4 million, a tiny percentage of the annual turnover of the companies involved.

2.5. Furthermore the Ombudsman will ensure that unfair practices that undermine suppliers and distort the market to the detriment of consumers are prevented. If the Ombudsman is effective, it will improve the market for consumers and lead to sustainable low prices across the retail sector.

*ACS recommends:*

*Implementation of the Competition Commission’s recommendation for the creation of an effective Ombudsman that proactively enforces the Grocery Supplier Code of Practice is vital to food security.*

### 3. Food Delivery

3.1. ACS does not deal directly with technical issues related to distribution of food to retail outlets. However we recognise the importance of this issue to food security. In 2006, 51% of food consumed in the UK was imported to the UK. The UK imports food from a range of countries in Europe and around the world, with a variety of production systems and land requirements. Of the 49% of food that the UK produces itself, it is highly reliant on transport.

3.2. A high level of reliance on transport to make up food networks is an environmental challenge. Food transport accounted for an estimated 30 billion vehicle kilometres in 2002 of which 82% were in the UK and produced 19 million tonnes of carbon dioxide, of which 10 million tonnes were emitted in the UK; almost all from road transport. It also proves a risk to food security as oil stocks dwindle.<sup>114</sup>

3.3. There are significant drivers towards efficiency in food distribution. The most obvious example is the ongoing consolidation of ownership in the convenience store sector. Table A shows the number of takeovers in recent years. There is also an increasing trend towards retailers joining together in “symbol groups” linked to major wholesale operations, a key benefit of which is efficiency of distribution. This consolidation brings down costs, but also presents risks.

**Table A: Big Four supermarket convenience store acquisitions**

<i>Date</i>	<i>Acquiring business</i>	<i>Acquired business</i>	<i>No. stores</i>	<i>Est. ave. t/o per store (£m.)</i>
Jan. 2003	Tesco	T&S Stores	1,215	2.1
Feb. 2004	Sainsbury	Bells Stores	54	1.0
Mar. 2004	Tesco	Adminstore	45	1.6
Aug. 2004	Sainsbury	Jacksons	114	1.3
Nov. 2004	Sainsbury	Beaumont	6	2.2
Apr. 2005	Sainsbury	SL Shaw	5	2.2
Total			1,439	ave. 1.98

*Sources: IGD, company press releases and annual accounts, and Christie & Co estate agents Business Outlook 2003, 2004, and 2005.*

<sup>113</sup> “Buyer Power and its Impact on Competition in the Food Distribution Sector of the European Union”, Professor Paul Dobson, 1999.

<sup>114</sup> “The Validity of Food Miles as an Indicator of Sustainable Development”, DEFRA, 2005.

3.4. We have seen an ongoing increase in store closures. This has the effect of reducing miles travelled to supply retail stores and this could produce results that might falsely be seen as environmentally beneficial. However the reduced access to food retail outlets increases the distances required to travel to food retail outlets by the customer themselves. In the UK in 2007 the UK public completed 12 billion miles in their cars accessing shops. Reducing numbers of retail outlets in the communities close to where people live increases shopping miles and this is likely to cancel out gains from distribution efficiency from delivering to fewer outlets.<sup>115</sup>

3.5. A key feature of food security is access to food within easy walking distance. Research commissioned by ACS shows that people want a food shop within 5 minutes walk (annex 2). Encouraging people to increase the amount of shopping that does not require a car is a key feature of effective food security. On an ongoing basis there need to be effective policies in place to encourage local shopping, using planning, town and local centre parking and public transport policies to ensure the prevalence and accessibility of local shopping options, as well as effective controls on harmful out of town and car reliant shopping.

3.6. The need for food access that is not reliant on the car has already shown itself to be acute when there have been crisis periods, like during the fuel shortage of 2000. At that time people were not able to rely on their cars, and therefore looked to local shops as a means of accessing food.

3.7. It is logical and necessary to prioritise the supply of food to shops close to where people live at times of crisis, rather than concentrating on supplying out of town shops that require people to travel in cars to access them. As it stands the approach to food distribution for access to fuel is wholly unsatisfactory and the issue needs urgent attention and a clear plan should be in place.

*ACS recommends:*

*A robust and consistently enforced policy to prevent harmful out of town retail developments.*

*Encouraging the public to shop in local shops through sufficient town centre parking, local transport, and developing strong guidance around town centre first planning policy.*

*Develop an action plan to deal with food distribution in the case of a fuel shortage, prioritising supplies to local shops.*

#### 4. Local Produce

4.1. Many convenience stores stock local produce. Locally sourced products feature in most categories of products stocked including meat, vegetables and locally produced condiments and cakes.

4.2. There is a big challenge for retailers to market locally sourced goods alongside the better known products due to a perception of higher prices and less identifiable packaging. Some of the methods that convenience store owners introduce to make local produce attractive to clients include:

- Signage with what is from the local area
- Food miles signage (showing the customer how far the product has travelled to the shelf)
- Special offers on local produce
- Tastings and other events

4.3. If handled correctly local sourcing can be a successful part of the retail offer, increasing customer loyalty and increasing the amount customers spend in a retail outlet. However there are significant challenges including:<sup>116</sup>

- Many retailers are lacking in knowledge about products and what does and doesn't sell.
- Some retailers are lacking in skills to source, range and market locally sourced products.
- Retailers can quickly lose confidence in a product if it does not succeed quickly, especially if wastage is high.
- Many retailers do not have the right contacts with local suppliers.

4.4. Sustain's research also found that there are challenges for local suppliers. Many suppliers are used to selling direct to the end consumers through farmers markets and farm shops. This usually requires minimal packaging, with display decisions under their control, and where the personal touch is an important selling point.

<sup>115</sup> "Food Distribution: An Ethical Agenda", Food Ethics Council, October 2008.

<sup>116</sup> Eat Somerset project run by Sustain.

4.5. However these operations are invariably limited in scale and reduce opportunities to increase the penetration of local produce into the local grocery economy. Producers need support to develop their products so as to make it possible for retailers to use their products. This includes working on a cost efficient means of supply, probably through collaboration with retailers and other local producers and a focus on effective marketing.

4.6. A good example is Somerset Food Links who are working to develop such a brand, known as “Levels Best”—to bring added value and marketing benefits to local produce, see <http://www.levelsbest.co.uk>.

*ACS Recommends:*

*Better access to information about the local suppliers in their region. As well as advice on stock, display and marketing local produce.*

*Introduce targeted financial incentives to mitigate the initial risk of making a loss when retailers first stock local produce.*

January 2009

**Annex 1**

#### ASSOCIATION OF CONVENIENCE STORES

ACS is the trade body representing the interests of over 33,000 convenience stores operating in city centres as well as rural and suburban areas. Members include familiar names such as Martin McColl, Spar and Thresher, as well as independent stores operating under their own fascia. Our members operate small grocers, off-licence or petrol forecourt shops with between 500 and 3,000 square feet of selling space.

### Memorandum submitted by Garden Organic (SFS 35)

#### 1.0 GARDEN ORGANIC

1.1 Garden Organic welcomes The UK Parliament Environment, Food and Rural Affairs Committee Inquiry—Securing food supplies up to 2050: the challenge for the UK.

1.2 Garden Organic is an organisation working to inspire, encourage and support individuals and groups to grow organically. This is achieved through research, demonstration, education and promotional activities and we work with individuals growing on a domestic scale, with groups growing on a community scale and with commercial fruit and vegetable farmers growing for local and national markets. Garden Organic is a membership organisation, with over 40,000 members. Over the last 15 years the organisation has been one of the main research providers for Defra’s Research and Development programme on organic horticulture. The organisation also runs a successful school education programme in over 5,000 schools in the UK.

#### 2.0 SUMMARY OF GARDEN ORGANIC’S SUBMISSION TO THE INQUIRY

2.1 The role and potential of gardening and home food production needs to be properly recognised within the UK food system. Action and investment is required so that home food production can fulfil its potential.

2.2 Support and investment in the UK organic fruit and vegetable supply sector should be increased.

2.3 There should be increased support and investment for the development of localised and resilient food production systems—systems that depend on the use of renewable energy and are based on the principles and practices of organic agriculture.

2.4 New food security policies for the UK needs to consider the resilience of the food system in wider terms; not only considering short term shocks to the system, but also the longer term challenges facing the food system, everything from climate change to dietary change. Food and farming systems for the 21st century will need to be shaped to address the New Fundamentals as outlined by Barling, Lang and Sharpe, 2008.<sup>117</sup>

2.5 It is Garden Organic’s view that the four points listed above (2.1–2.4) are all important within the debate and that they need to be addressed to ensure food security. In this response however, we have chosen to highlight the role of home food production in particular (2.1).

<sup>117</sup> Barling D, Lang T, Sharpe R. (2008) Food capacity: the root of the problem. *Journal of the Royal Society of Arts*, 154, 5533, 22–27.

### 3.0 GARDENING AND HOME FOOD PRODUCTION

3.1 Production of fruit and vegetables in domestic gardens, community gardens, allotments, schools and on other communal land can and should have an important role in ensuring UK food security. Home production needs to be recognised as an important complement to the supply of fruit and vegetables from commercial growers and as an integral part of the UK food supply chain.

3.2 The role and potential of food production at a domestic scale needs to be core in the forthcoming UK food security policy, providing an important “safety net” within the food system by addressing availability, access and affordability of food, fruit and vegetables in particular. Active involvement in food production, at whatever scale, is vital in terms of reconnecting people with the food they eat.

3.3 Encouraging and supporting people to garden and produce some of their own fruit and vegetables will help to meet wide ranging government objectives; environmental and social objectives as well as objectives related to health and well being. In brief, the benefits of gardening and home food production are as follows:

- 3.3.1 Home food production can contribute towards ensuring food security by providing access to affordable fruit and vegetables for people.
- 3.3.2 Growing some of their own produce will influence people’s dietary choices. It will increase consumption of fruit and vegetables and enable more people to reach the 5-a-day target.
- 3.3.3 Organic gardening, including home composting and home food production, will help to address climate change issues by reducing the carbon footprint of UK households.
- 3.3.4 Providing opportunities for people to reconnect with the food they eat will help to increase their awareness of food issues, for example the real value of food and the importance of reducing wastage of food.
- 3.3.5 The physical activity of gardening and access to gardens and green spaces will improve health and well being of people and support community cohesion.
- 3.3.6 Organic gardening will provide environmental benefits by maintaining and increasing biodiversity, including the conservation of genetic diversity of food crops, by improving the health of soils and protecting the stores of carbon in garden soils.
- 3.3.7 Use of domestic gardens for diverse plantings will provide areas for infiltration of rainwater and thus help to prevent flooding in urban areas.

### 4.0 ACTIONS REQUIRED

4.1 In the UK the time is now right for home food production to play its role. Current trends show that people are becoming more interested in the food they eat, its quality and where it comes from and increasing numbers of people want to garden organically and grow some of their own fruit and vegetables. Actions are now required at all levels to ensure that people’s intentions are mobilised into practical and successful action.

4.2 The actions required by UK Government for gardening and home food production to fulfil its potential are as follows:

- 4.2.1 Ensure that gardening and home food production are considered as essential life-skills, with adequate provision of education and training opportunities for children and adults and aiming for high levels of “food literacy” in the UK.
- 4.2.2 Encourage and support people with their gardening and food growing activities, through communication, training and provision of resources.
- 4.2.3 Provide access to land for all people, by ensuring adequate provision of gardens in new housing developments, increased provision of allotment areas and community gardens and support for landowners who want to initiate community supported agricultural schemes.
- 4.2.4 Invest in research and development activities specifically targeted at gardening and food production at this scale.
- 4.2.5 Garden Organic encourages the UK Government to initiate a national campaign to encourage the public to grow fruit and vegetables in their gardens, allotments, in schools and on other communal and public land.

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**Memorandum submitted by John Innes Centre (SFS 36)**
**EXECUTIVE SUMMARY**

- The UK has a strong science base in both Universities and Research Institutes. However research and development is urgently needed to improve our ability to exploit the full genetic potential of crops. We also need to develop R&D for improving the resilience of crop production to global climate change, while maintaining adequate production with reduced impact on the environment and reduced inputs.
- In order to encourage the application of research and training to food security, there should be greater recognition for researchers who make exceptional contributions in this area. At present, it is widely believed (often with good reason) that a career in fundamental research on model systems offers greater rewards than one in more immediately applicable research on crop systems. Such recognition should nonetheless require excellence (within the appropriate frame of reference) because scientific excellence is required for research to be relevant and have impact.
- New levels of organisation need to be established to make efficient use of new technologies (high throughput genotyping, next generation sequencing, marker assisted breeding) enabling their deployment in the UK breeding industry.
- There is a serious lack of national expertise in some key skills, notably the field-level sciences of plant breeding, crop physiology and field plant pathology. Again excellence is critical. Defra has a role in funding training at the masters and doctoral levels, to supply staff with advanced training in these areas to UK companies, to academic research and to research at the interface between the public and private sectors, such as pre-breeding and public-good plant breeding.
- Defra should fund R&D to deliver as well as inform policy (cf USDA, US DoE) with projects peer-reviewed and monitored by the most appropriate research Councils (cf DfID-BBSRC).

**Q1. *How robust is the current UK food system? What are its main strengths and weaknesses?***

1. The comparative stability in the yields of arable crops in the UK is the result of a generally mild climate and good land management, combined with technological innovations to maintain yields despite variation in such factors as weather and parasites. The output of UK arable farming is therefore sustainable but vulnerable to increased variation in the climate and excessive restriction on the application of science to agriculture. Significant challenges include climate change, competing demands for land use, rising costs of oil (resulting in an increased cost of fertilisers) and variability in pests and diseases.

2. The UK's strengths include the high productivity of arable farming and the high degree of technological awareness of most farmers. Food production in the UK is well-placed to contribute to food security by maintaining output despite changes in climate and consumer demand, provided that it is able to continue to take advantage of new technology.

3. The science base in the UK is a particular strength because organisations such as the internationally recognised BBSRC Institutes in Norwich, the Institute of Food Research and the John Innes Centre, provide the scientific underpinning required to address the issue of food security, focus research on the effects of climate change on yields and assist the industry in improvement of crops for food, chemical and energy use.

4. A long-term weakness over the past 25 years is financial and regulatory pressure on the farming sector as a whole. This has caused much of the considerable investment in new technology made by arable farmers over the last 25 years to be directed at reducing costs rather than increasing the UK's total output (see paragraph 7). A long-term weakness for future food production is that the UK (as elsewhere) lacks understanding of how the environment and climate change will affect crops.

5. Given that most of the increase in yield of arable crops per unit area over the last 30 years has come about through improved plant varieties (source: NIAB), the health of the UK plant breeding industry is critical. The sector is technologically strong but is largely owned by non-UK parent companies, which means it is potentially vulnerable to commercial changes unrelated to the needs of UK agriculture. A further weakness is the shortage of trained personnel in some key areas (see paragraph 17).

6. A growing weakness is public opposition to technologies on which the UK's highly productive arable farming relies, notably important pesticides. This points to an underlying weakness in the education of UK citizens about food and farming.

**Q2. *How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?***

7. The UK has a strong science base and new technologies are often applied rapidly in arable farming. In principle, the UK should be well-placed to respond to the challenge of increasing food production despite the increasing uncertainty in the national and global climate. However, this will require both the economic

basis of food production to be strengthened and the regulatory framework to be relaxed, so that arable farmers have both the incentive and the capacity to apply technological innovations towards increasing total production rather than maintaining existing production at lower costs.

8. A key technology for increasing food production is plant improvement. The UK has some but not all of the components required to ensure continuation of the food production industry's ability to capitalise on the strong research base in genetics and the emerging genomic technologies. Particular areas that require strengthening are training in certain key areas (see paragraph 17) and public education about the role of technology in food production.

9. As the climate changes, there will be an increasing need to develop more resilient varieties and crop production systems (i.e. better rotations perhaps with new crop species). Climate change will affect the physical stresses on crops, such as temperature and rainfall, and the severity and prevalence of diseases. In both cases, increased genetic diversity will help to buffer crops against inherently unpredictable variation. This could include both a greater range of crop varieties and the use of genetic variation within crops to achieve greater stability in yields. Continuous improvements in plant varieties need to be combined with continued advances in agronomy to sustain the high yields of UK crops. Regulations which restrict farmers' ability to use technological innovations with no proportionate benefits to health or the environment should be seen as undesirable from the point of view of food security.

Q3. *In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

*Soil quality*

10. The potential limitation of phosphate supply to agriculture, given that it is a solely mined resource, requires a robust approach to increasing fertilizer use efficiency that address not only P but also N, K and S. This area could be addressed in several ways including: a) by applying GM approaches to improving nutritional quality (more value from the same biomass) in "better than natural" products, which would also have better chance of public acceptance, b) understanding how soil microbes and other microbiota interact with different crop species and how this may change in response to climate change, and in relation to this understand whether legumes change soil microbes by the production of H<sub>2</sub> as a consequence of their symbiosis, c) developing increased sustainability in rotations (legume inclusion) and d) understanding how to improve root biomass and how regulatory networks and genetic pathways function in root development.

*Water availability*

11. Presently drought stress is the major limiting factor to crop production in developing countries and is an area of science where the UK can have an impact. Plant genetic diversity, advanced genomic science and comparative biology can be used to develop tools and technologies that will help plant breeders produce crop varieties adapted to drought.

*The science base*

12. The UK has a strong science base in both Universities and Research Institutes however research and development is urgently needed to improve our ability to exploit the full genetic potential of crops, and to develop R&D for improving the resilience of crop production to global climate change, while maintaining adequate production with reduced impact on the environment and reduced inputs.

13. New levels of organisation need to be established to make efficient use of new technologies (high throughput genotyping, next generation sequencing, marker assisted breeding) enabling their deployment in the UK breeding industry. R&D alliances, such as those between JIC, RRES and NIAB, between EBI (European Bioinformatics Institute) and JIC, and between NIAB and breeders, are starting to link the required expertise and develop joint research programmes to establish some of the components of "public good plant breeding" especially pre-competitive germplasm improvement. This should initially be focussed mainly on wheat improvement but other crops, eg Oilseed rape, could also benefit from a similar approach. A much greater and concerted effort is required at the national, and probably European level,

14. Coordinated and concerted effort to develop the existing R&D in interdisciplinary and collaborative ways, including that crossing large academic gaps (e.g. plant developmental biology to global environmental sciences) in the long term, across the university, institute and industrial sector is required.

15. Capitalisation on the translation of genomic technologies developed in model and non-plant systems into commercially relevant crop species is required allowing the integration of genomic technologies with traditional breeding reducing the time required for the identification and selection of useful traits.

16. The main UK rotation crops—wheat, barley, legumes, oilseed rape, sugar beet and potatoes—need coordinated, concerted activity in genetic improvement. Focussing on one rotation crop will not provide benefits in the long term. This involves genomics to discover new genes and useful genetic diversity, wide crosses and marker assisted breeding to accelerate breeding from a wider base of useful variation, and GM

methods where a single gene has agricultural and consumer benefits. Increased knowledge of gene function generated in model systems such as Arabidopsis will flow through to crop improvement, therefore maintaining parallel paths of basic and applied research is of paramount importance.

#### *The provision of training*

17. There is a serious lack of national expertise in some key skills, notably the field-level sciences of plant breeding, crop physiology and field plant pathology. Degraded funding and infrastructure has made it difficult to address this diminished skill base. Defra has a role in funding training at the masters and doctoral levels (also see paragraph 34), to supply staff with advanced training in these areas to UK companies, to academic research and to research at the interface between the public and private sectors, such as pre-breeding and public-good plant breeding.

18. In order to encourage the application of research and training to food security, there should be greater recognition for researchers who make exceptional contributions in this area. At present, it is widely believed (often with good reason) that a career in fundamental research offers greater rewards than one in applicable research. Strenuous efforts should be made to change this. For example, promotion opportunities for scientists should value significant practical results of research as greatly as publications in highly-cited journals, while the Research Assessment Exercise should be overhauled to give much stronger encouragement to universities to participate in long-term research to support food security. Nonetheless an unremitting emphasis on peer-reviewed excellence (within the appropriate frame of reference) is required for delivery of high impact even for work near to application.

#### *The way in which land is farmed and managed*

19. An approach based on greater integration of standard, organic and alternative types of farming should result in more sustainable practices. Integration of organic practices with scientific innovation would be highly desirable. Currently there is an ideological barrier that impedes the productive alignment of research in sustainable low input agriculture and genetic improvement of crops.

20. Developing precision agronomy linked with better understanding of climate change and crop response (satellite tracking, nutrient status and appropriate minimal treatment).

21. Understanding the potential of biochar in soil improvement, nutrient delivery to crops, and impacts on soil microbiology, and hence crops, requires assessment.

22. Maintaining the capacity to respond to ever-changing variation in pathogens, for example through the UK Cereal Pathogen Virulence Survey and responding to new diseases by “buying time” with pesticides while breeders produce resistant varieties.

23. Decreasing post-harvest losses must also be a major scientific target.

24. For legume crops, the need to adopt changes in patterns of food consumption, focussing on legumes (pulses) as sources of high nutrition foodstuffs, requires greater development of legume genetics, genomics and agronomy.

25. A wider acceptance of GM approaches to improving crops needs to be promoted. An example of this would be GM engineered virus resistance which will become important given that the European Parliament would like to ban most of them, resulting in a loss of pest control.

*Q4. What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

26. Meat consumption is increasing to above sustainable levels consumption patterns will need to change and a shift from milk and dairy consumption to legumes (e.g. pulses) as a high protein foodstuff will be needed. This must be aligned to increased productivity with lower inputs, based on the environmental impacts of agriculture and the cost of energy for inputs.

*Q5 What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

27. Defra should consider funding R&D in key subjects related to crops and food security emphasising excellence for relevance and impact.

28. Continue to support LINK-type research involving partnership between academics & industry, particularly in the area of plant breeding enabling the production of crops better adapted to climate and parasite variation.

29. Be prepared to support public-good breeding/biotech especially for minor crops ignored by industry and also for traits not addressed adequately by industry.



30. Play a direct role and show leadership in Europe in the reduction of regulations to enable farmers to use technology effectively.

31. Play a role in educating the public making them aware of the food production process.

32. Overall Defra presently funds research largely to inform policy development. In the US, USDA (United States Department of Agriculture) and DoE (Department of Energy) fund R&D to deliver policy outcomes, e.g. co-funding (with NSF) of genome sequencing for key food and energy crop species. Defra should provide substantial peer-reviewed funding for such policy delivery goals administered by the appropriate Research Council(s) (cf the recent DfID-BBSRC International Development Science Programme).

*Q6. How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

33. Regarding support for science and technology, the LINK programme is an excellent example of collaboration between Defra, other government departments, levy boards, trade associations, individual companies and private sector researchers. The best LINK projects exemplify the application of good science to technological innovation. Any replacement for LINK, such as Technology Strategy Boards should maintain the close connection between researchers and industry. It is important that initiatives for future LINK projects (or projects funded by successor organisations) can come from researchers as well as from industry. It is also important that LINK and its successors make it as attractive for leading researchers to participate in collaborative projects with industry as to seek funding for fundamental research.

34. The withdrawal of MAFF's studentship scheme was regrettable. It was anticipated that the gap in training of personnel in agricultural sciences would be met by Research Council studentship but this expectation has largely not been met. Studentships offered by levy boards are helping to fill the gap but a scheme run by Defra itself, comparable to the old MAFF scheme, would help to reverse the decline in training relevant to the technology of arable farming.

35. The plant breeding sector consists of several mainly small companies. Defra has a special role in ensuring that they have access to technological developments and trained staff. The requirement for a 50% minimum contribution from industry should be relaxed, as it severely limits the ability of small companies such as plant breeders to take advantage of the opportunities offered by LINK. The size of contribution from industry to CASE studentships excessive for a small company and this should also be relaxed, to encourage advanced training in science and technology relevant to breeding.

36. Regarding the regulatory framework, it is evident that there is a strong trend for European regulations to suppress the use of technology in agriculture, including pesticides and genetic modification. Against this trend, Defra should advocate an integrated approach to crop management but the current status of legislation on the use of pesticides (mid-January 2009) indicates that Defra has had only limited success in this direction. Greater efforts are required to ensure that arable farmers in the UK (and indeed in Europe as a whole) will continue to have access to the full range of tools they require to maintain, let alone increase, food production.

*Q7. What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

37. There are many sets of official statistics relating to food security and climate change available that could be used to monitor how well the UK is responding to increasing global food production.

January 2009

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**Supplementary memorandum submitted by the John Innes Centre (SFS 36a)**

**FURTHER THINKING ON HOW FUNDING SHOULD FLOW**

We believe that funding for LINK projects has to be based on a developed, mutually beneficial relationship between an industrial partner and an academic partner. This is a process that requires dialogue and considerable effort from both parties and when done effectively will ensure that the best possible science is achieved along with the best possible outcomes, academically and in application. It is not a process that can be conceived through identification of an industrial, end-user need to which academic institutions would bid to on a purely contractual basis. This is unlikely to lead to the best science quality. Mechanisms are required that will simplify building and strengthening links between academia and industry.

We understand that Sustainable Arable LINK committee will only have a few more meetings this year before it's absorbed into the Technology Strategy Board. The TSB would need to be cognizant of the arguments given above on science quality and the impact of relationship development and mechanism on this. We are seeking to engage with the TSB on this specific issue.

*April 2009*

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**Memorandum submitted by Mr John Scott (SFS 37)**

May I put forward two suggestions which I am keen to see being [made] mentioned and which I hope might be placed on your Committee's agenda.

**1. REGIONAL FOOD DEPOTS**

Supposing a regional or national emergency completely disrupted transport of food into our towns and cities, then they would be brought to the brink of starvation within a matter of days. Forres, where I live, for example would clear the shelves and stores of its three supermarkets, three butchers and two bakeries in about ten days as well as emptying its fridges and freezers at home. About 7,000 household shoppers rely on Forres for food. Abattoirs, dairies, grain millers and breweries, as well as fish markets are all miles away to the east and south and would be out of reach in an emergency.

It seems very important that, without raising public alarm, regional food depots for dry foods, with enough fuel and dedicated transport, are put in place to deal with a regional or national emergency that threatens or causes a food shortage that could last, say, two weeks.

**2. THE FARM CARBON FOOTPRINT**

A hectare of wheat, harvested, has, I believe, a carbon footprint whose size is rarely acknowledged. That is caused not just by the fuel and lubricants in the tractor and combine but also by the need to buy in seed, bag fertiliser (especially nitrogen), and chemicals which depend on oil. The total size of this footprint is of course the inescapable outcome of industrialised agriculture.

A useful way to reduce it is for farmers everywhere to club together in a co-op and produce their requirement for diesel from say oil seed rape. The process of turning rape seed into fuel is simple, suitable for farm establishment and an effective replacement of diesel from the oil well. Such a co-op would be excused most of the fuel duty, and it would gain from the R.O.C.'s attributed to it, and finally from the sale of spent seed as cattle food. It seems to me that belonging to such a co-op should be a condition for receiving a full "single farm payment".

*January 2009*

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**Memorandum submitted by Morrisons (SFS 38)**

**EXECUTIVE SUMMARY**

- Morrisons' business model is different from many other supermarket retailers. We source most of our meat and produce direct from farms and prepare and process it ourselves. This supply chain gives us an unrivalled opportunity to provide customers with fresh quality food at affordable prices.
- Morrisons' vision for the future of British farming is a highly productive and efficient supply chain developed within a framework that ensures good science-based ethical and environmental standards delivering competitive products that are affordable.

*Recommendations:*

- Morrisons recommends that an additional strategic policy objective should be added to the Government's vision as set out in "Food Matters: Towards a Strategy for the 21st century", namely the securing of "a re-structured British farming base focused on driving productivity and efficiency".
- Morrisons recommends that DEFRA ensures that new regulations taking forward the Health Check of the CAP do not unduly focus on schemes to protect the natural environment, but are targeted at schemes that drive farm and supply chain productivity and efficiency without damaging

the environment. This does not mean a re-introduction of production coupled payments to support specific farming sectors, but does mean that targeted funding is available to facilitate structural change to British farming focused on long term viability and profitability.

- Morrisons recommends that the Government is consistent in its implementation of animal welfare and food safety standards and does not “gold plate” the already strong welfare legislation coming from the EU. The Government should also adopt a better risk-led approach to safety regimes, targeting the likely hotspots of potential danger.
- Morrisons recommends that DEFRA champions within government the establishment of financial instruments, e.g. a futures market, particularly within the red meats sector, that can help retailers, processors and farmers manage price volatility and provide more security within the supply chains to help reduce shrinkage in the British farm base.

## 1. INTRODUCTION

1.1 Morrisons welcomes the opportunity, as a retailer and food manufacturer, to respond to the EFRA Committee’s inquiry “*Securing food supplies up to 2050: the challenges for the UK.*” This response summarises some of Morrisons’ practices to help ensure the security of food, including our commitment to British farming and a sustainable supply chain.

1.2 The response also sets out key issues for the Government and wider public policy to ensure the long-term viability of food production in the UK.

## 2. MORRISONS—HELPING SECURE THE LONG-TERM VIABILITY OF BRITISH FARMING<sup>118</sup>

2.1 Morrisons’ vision is to be the “Food Specialist for Everyone”. Our business model is different from many other supermarket retailers. We source most of our meat and produce direct from farms and prepare and process it ourselves. This supply chain gives us an unrivalled opportunity to provide customers with fresh quality food at affordable prices. As we are closer to source, it also gives us first-hand understanding of the issues faced by farmers in the supply chain and drives our commitment to help secure the long-term viability of British farming.

2.2 Morrisons is the only major retailer to sell 100% fresh British beef, pork and lamb. Our buyers visit farms to source animals directly of the highest quality. Livestock is transported to Morrisons’ owned abattoirs. From there the fresh meat is supplied direct to stores in large cuts ready for our trained butchers to prepare it to our customers’ requirements. We make use of the whole carcass by sending the meat that is not cut in-store to *Farmers Boy*, our food manufacturing facility, where it is used in products such as pies and sausage rolls. By maximising the utilisation of the carcass we are able to give a fair price to the farmer.

2.3 Similarly we operate “whole crop purchasing” from the fields of arable farmers so that they are not left trying to offload some of their crop not taken by other retailers. We believe this offers farmers a fairer deal. We wash, grade and pack the produce ourselves. This allows us to price individual products so, for example, with broccoli we can sell sizes that are often rejected by other retailers.

2.4 Our commitment to help secure the long-term viability of British farming has led us to establish a series of producer groups. These are developing programmes to help drive the efficiency and effectiveness of the supply chain, including the application of on-farm research. These programmes will be rolled out in 2009 to help strengthen our supply chain with British farmers.

## 3. RESPONSE TO INQUIRY QUESTIONS

*How robust is the current UK food system? What are its main strengths and weaknesses?*

3.1 The current UK food system operates on free market principles. However, it is an unbalanced market. The UK operates its own national market. It also operates within the European Union. Together, the UK and EU operate in the global market, having to work within trade barriers.

3.2 The robustness of the UK’s food system is dependent on the direct and unintended consequences of interventions at all three levels of this unbalanced market. For example, the European Union legislates for animal welfare standards. These are widely held to be the best in the world. When implemented in the UK, the Government often seeks to ensure that they are implemented to the highest standard and advocates further improvements.<sup>119</sup> However, animals entering the UK from outside the EU are not necessarily subject to any of these additional welfare standards. This unbalanced market is a major constraint to competitive food production.

<sup>118</sup> Morrisons: Top 5 food producer in the UK: 3 abattoirs, 7 packhouses and food production sites, 3 bakeries. Only major retailer to sell 100% fresh British beef, pork and lamb. 380 stores; 117,000 employees; 10 million customers/week.

<sup>119</sup> e.g. Government’s Initial Response to the Farm Animal Welfare Council report on the welfare implications of farm assurance schemes (2006).

3.3 Perhaps the most fundamental intervention into the market that affects the robustness of the UK food system is the Common Agricultural Policy (CAP) and its reform. The progression from direct payments to the single farm payment and now the shift towards environment and rural development schemes will have the single most dramatic effect on the future of British farming. The withdrawal of single farm payments will help create a freer market, but the long-term viability of British farming is threatened if the focus of grant assistance is not on the efficiency and profitability of the industry. Many farmers will struggle to adapt to the dismantling of the CAP over the next decade, given its development over the past fifty years. Put crudely, the UK may be able to sustain the environmental heritage of our farming landscape, but may struggle to provide livestock and crops for its food system.

3.4 There are strengths in the UK food system, notably the suitability of our natural resources, e.g. temperate climate, and the quality of animals and crops that can be produced. But there are also weaknesses. Many of them are structural. Our farming base is fragmented, with too many holdings that operate on an insufficient scale. This makes for a long, and often convoluted, supply chain, which inherently means that British farming has a higher cost structure.

3.5 For a retailer like Morrisons that is committed to supporting British farming and only selling British fresh beef, lamb and pork this could impose long-term constraints on our business. With a declining farm supply base, customers wishing to purchase fresh British meat may find it increasingly uncompetitive in price compared to imported product. (Note: the current weakness of Sterling against the Euro means that British product is at this time competitive on price, but this makes it even more suitable for export thus further constraining supply for our domestic market).

3.6 A further weakness likely to affect the robustness of the UK food system is the risk associated with the rising average age of British farmers. The Government may wish to consider whether individual financial incentives may be necessary to encourage the next generation of farmers.

*Recommendation:* Morrisons recommends that an additional strategic policy objective should be added to the Government's vision as set out in "Food Matters: Towards a Strategy for the 21st century", namely the securing of "a re-structured British farming base focused on driving productivity and efficiency".

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

3.7 Land in the UK, however fertile, is finite and will inherently play a limited role in increasing global food production. Nevertheless, the high quality of livestock and crops produced in the UK means there is opportunity to meet the growing demands of our domestic, as well as the international, market.

3.8 If we are to seize these opportunities, farmers in the UK should be encouraged to make further improvements in productivity or profitability. Environmental stewardship grants may currently serve as disincentives to farmers to focus on the measures needed to dramatically increase efficiency, yield and profitability of livestock and crops if we are to meet the demands of rising population. For example, our fragmented pig industry struggles to compete with large scale farms in Denmark capable of handling tens of thousands of pigs a week through an integrated supply system. The challenge for British pig farmers is how to sustain high welfare standards at a larger scale that brings productivity benefits.

3.9 Morrisons' vision for the future of British farming is a highly productive and efficient supply chain developed within a framework that ensures good science-based ethical and environmental standards delivering competitive products that are affordable. This does not mean more intensive farming for the sake of it. It does mean driving out current inefficiencies in the supply chain where possible. For example, in the beef herd a head of cattle may move 4 times from being bred to being slaughtered. If this movement can be reduced, it may not only help improve welfare but also drive cost efficiency enabling British livestock to remain competitive.

3.10 Morrisons' commitment to 100% British fresh meat shows that it is possible to focus on encouraging British production. However, action is needed to ensure fairer competition for farmers, making it easier for them to produce high quality food at competitive prices in the UK.

*Recommendation:* Morrisons recommends that DEFRA ensures that new regulations taking forward the Health Check of the CAP do not unduly focus on schemes to protect the natural environment, but are targeted at schemes that drive farm and supply chain productivity and efficiency without damaging the environment. This does not mean a re-introduction of production coupled payments to support specific farming sectors, but does mean that targeted funding is available to facilitate structural change to British farming focused on long term viability and profitability.

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

- soil quality
- water availability
- the marine environment
- the science base
- the provision of training
- trade barriers
- the way in which land is farmed and managed

3.11 The fundamentals of much of the British supply side of the food system are reasonably strong: diverse and rich soil quality complemented by good rainfall and reasonable water management. The science base is present, if under-invested, and world leading training exists for the relatively small cohort of future farmers.

3.12 As discussed in paragraphs 3.1 to 3.3 above there are trade barriers that unbalance the market and hinder the potential competitiveness of British farming, not least by focusing too much attention on preservation of the environment ahead of farming practices. More significantly the fragmented way in which land is farmed and managed, is hindering the opportunity to increase production significantly.

3.13 Enabling larger farms and driving productivity gains across the industry will strengthen the supply side of the food system, and enable better sustainable development. Morrisons is seeking to play its part by improving our own supply chain and investing in on-farm applied research.

*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

3.14 The key demand side trend is value, expressed as a combination of quality and price. British consumers are increasingly looking for value. They are unwilling to compromise on the quality of the fresh food that they buy, and they are very price conscious. Provenance matters, but there are signs in the market that they are not prepared to pay regularly a premium for local products. For example, that is why Morrisons has introduced a regional focus to our standard milk, rather than differentiating it as a separate premium product.

3.15 British farming produces excellent high quality products. The challenge on the demand side is to ensure that they are affordable for British consumers and not just for the premium export market. Morrisons' vertically integrated supply chain for livestock enables us to pay farmers a fair market price and provide our customers with great quality fresh meat at market leading prices. In the future this may become harder, for example if animal welfare and safety standards become more stringent or are unevenly enforced.

3.16 While a viable UK farming industry needs appropriate standards to inspire consumer confidence in the quality and safety of its produce there is a case for a better balance between consumer safety and over-regulation. A well-balanced regulatory system would see consistency of approach across the chain, ensuring that scientifically-based standards apply to animal feed as well as to the welfare of the animals when they are being reared and finished, and to the standards in the abattoir and final processing.

3.17 At present there is a disproportionate focus on safety in the fresh meat part of the chain. Large scale providers with a consistent throughput of similarly graded animals are regulated to the same degree by the Meat Hygiene Service as smaller abattoirs with a mixed range of stock and carcass specification. Moreover, with final processing cooked meats receive far less attention than fresh meat despite having a potentially higher safety risk as they will not be cooked again before consumption.

3.18 Affordability may also become harder, if local food networks are unduly promoted as a panacea for the UK food system. Morrisons has been trialing a local food range in Yorkshire. Sales are good for chilled ambient products, but they inevitably retail at a less competitive price because of the differences in the supply chain—both the cost of production and its distribution. In comparison to our national supply chain, local food networks cannot deliver the combination of good quality and affordable price that the majority of our customers expect and demand. For example, when it comes to fresh red meat, our customers are delighted by the high quality associated with its British provenance and are willing to pay prices that are very competitive against other food retailers. Local food networks for fresh meat are unlikely to be able to compete with imported products.

*Recommendation:* Morrisons recommends that the Government is consistent in its implementation of animal welfare and food safety standards and does not “gold plate” the already strong welfare legislation coming from the EU. The Government should also adopt a better risk-led approach to safety regimes, targeting the likely hotspots of potential danger. The Meat Hygiene Service could introduce self-regulation to top tier processors.

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

3.19 As discussed above, the priority for DEFRA should be to focus on driving higher productivity from the British farm supply base without compromising environmental protection. At present, from a food manufacturing and retailing perspective the emphasis is much stronger on environmental protection with less effort devoted to ensure structural reform of British farming to ensure its long-term viability in producing high quality livestock and crops.

3.20 Two measures that DEFRA could champion to help drive long term viability of farming are the introduction of a futures market and better supply chain finance.

3.21 With prices becoming more volatile for British products, particularly red meat, a clear system for forward pricing could enable farmers and others in the supply chain to plan more confidently for the future. This could also enable further structural change. DEFRA could lead work with the Agriculture and Horticulture Development Board to develop the financial tools that would enable a futures market to be established.

3.22 DEFRA could also lead work with H.M. Treasury and BERR to ensure that farmers are able to access finance for their businesses. For example, herds are getting smaller partly because farmers increasingly cannot get a mortgage on their stock. They require funding up front to buy and rear their stock before they can hope to make a return but securing finance is becoming harder. New instruments that are able to include the stock as security, not just land and other capital holdings, could ease a constraint that is undermining the fundamental structure of British farming.

3.23 Labelling is another important issue that DEFRA is rightly championing. Morrisons welcomes DEFRA's new drive to ensure greater clarity on the country of origin labelling for food. This could also be extended to improving the requirements and sensible enforcement of traceability when unforeseen events arise.

3.24 Finally, where synergies between retailers could help to increase efficiencies and the volume of UK produce, eg the creation of regional hubs for small producers, the Government would need to support this explicitly and drive its implementation as retailers would be unable to collaborate on such a project under current competition laws.

*Recommendation:* Morrisons recommends that DEFRA champions within government the establishment of a futures market and better supply chain finance to help reduce shrinkage in the British farm supply base. DEFRA should also continue to strive for greater clarity on country of origin labelling.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

3.25 Morrisons would like to see DEFRA be the champion of the farming and food production industry. DEFRA needs to remain focused on taking an holistic approach to policy that works across the whole food production chain. The foundation for the cross-Government food strategy should be increasing the sustainability of British farming by integrating environmental, animal, safety and social needs with supply chain development, efficiency and improving final product value.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

3.26 In addition to criteria that measure welfare, safety and environmental performance, Morrisons holds the view that increasing the productivity and efficiency of the British farming supply chain should also be a key performance indicator.

January 2009

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**Memorandum submitted by Dairy UK (SFS 39)**

#### EXECUTIVE SUMMARY

1. Dairy UK welcomes the EFRA inquiry into food security. Inadequate attention has been given over the past few years to issues of production and food security.

2. The depth of dairy industry expertise and investment at the farming and processing levels, high levels of product safety and innovation, as well as consumer recognition of the nutritional importance of dairy products, means that in the medium to long term the dairy industry is robust. Both the strengths and the weaknesses of the dairy sector can be strongly influenced by Government policy.

3. The challenge for the UK dairy industry is for the sector to reach its productive potential.

4. Generally the industry is optimistic that, if it receives the appropriate backing from Government, it can exploit the rising global demand for dairy products and move towards realising its potential. However the Government must be willing to help the industry if the growth in supply from low cost producers around the world undermines the viability of the sector.

5. The sector would benefit if Government policy in a variety of areas was reconsidered including:

- research and development;
- the provision of training;
- environmental and regulatory compliance costs;
- competition policy;
- implementation of FSA initiatives; and
- protecting the industry from price volatility.

6. Consumer trends should see more opportunities for product differentiation in the long term, although the recession is currently putting a greater focus on value.

7. Local supply is clearly an opportunity for adding value, but the structure of the industry means that the emphasis for the dairy sector has to be on national supply networks.

8. Defra should acknowledge its responsibility to sustain the productive potential of the UK dairy industry.

9. The Vision for the CAP produced jointly by the Treasury and Defra needs to be updated to take account of the food security agenda. The CAP needs to be retained as an agricultural policy. A purely rural policy is no substitute. The CAP also needs to continue to play a role in minimising market volatility.

## INTRODUCTION

10. Dairy UK is the trade association that represents the interests of dairy farmers, producer co-ops and dairy companies in the UK. Members of Dairy UK process around 90% of the milk produced in the UK. Further information on Dairy UK can be found at [www.dairyuk.org](http://www.dairyuk.org).

11. Dairy UK welcomes the EFRA inquiry into food security. Inadequate attention has been given over the past few years to issues of production and food security.

12. The UK dairy industry is a major component of the UK food sector. Dairy farming accounts for 18% of the value of UK on-farm production and dairy processing accounts for 12% of the value of food processing in the UK.

13. This submission will answer the questions set out in the announcement for the inquiry from the perspective of the UK dairy industry.

### *How robust is the current UK food system? What are its main strengths and weaknesses?*

14. The depth of dairy industry expertise and investment at the farming and processing levels, high levels of product safety and innovation, as well as consumer recognition of the nutritional importance of dairy products, means that, in the medium to long term, the dairy industry is robust.

15. In the short term the dairy sector is vulnerable to its high dependency on energy, limited holding of critical inputs, just in time stock control through the food distribution system and the complexity of the supply and distribution chain.

16. Dairy industry strengths include:

- benign weather and excellent natural soil fertility;
- high average scale and efficiency of dairy farms;
- an efficient and dynamic processing sector;
- high degree of industry professionalism;
- high levels of product safety and innovation;
- high levels of demand and consumer confidence in the safety of dairy products and their nutritional value; and
- strong sense of Corporate Social Responsibility within the sector, in particular the commitment of the industry to improve its environmental performance through the Milk Road Map.

17. Dairy industry weaknesses include:

- low margins from the intensely competitive environment created by a high degree of concentration amongst industry customers;
- insufficient investment at the farming level due to lack of confidence over the industry's future;
- difficulties in attracting and retaining skilled labour;
- absence of effective private or public sector mechanisms to reduce the impact of price volatility;
- exposure to the volatility of sterling;
- historic Government indifference to issues of production and productivity;
- excessive focus by Government R&D on environmental and sustainability issues at the expense of production; and
- public hostility to technologies that may increase productivity such as GM.

18. Both the strengths and the weaknesses of the dairy sector can be strongly influenced by Government policy.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030, and doubling it by 2050, while ensuring that such production is sustainable?*

19. The challenge for the UK dairy industry is for the sector to reach its productive potential, otherwise the UK will be exposed to greater dependency on imports and the UK industry cannot make a contribution to meeting global demand by increasing its exports.

20. Milk production in the UK has been falling for four years. Demand is stable, which means that imports are increasing.

21. The reform of the CAP means that the EU dairy industry will be more directly exposed to the world market, consequently the UK industry will be operating in a price environment created by the interaction between supply and demand for dairy products over many regions of the world.

22. Whilst it is widely expected that prices created from this exposure to the global market will be much more volatile, it is not clear exactly where in the future average prices will reside, and consequently whether the UK will be competitive.

23. The importance of EU production to meeting global demand for dairy products would support the assumption that prices should be at a level that will keep efficient EU dairy farmers in production. However, whilst this may be true of Europe in general, because the UK is not in the eurozone, then the future value of sterling has to be taken into account.

24. Because a large proportion of UK domestic demand is for fresh dairy products that can only be met by domestic production, then the need to secure domestic supplies should ensure that in the long run dairy farmers involved in the fresh product supply chain should receive sufficiently high prices to cover their costs of production. However, a significant proportion of UK farmers are directly exposed to the global market through the manufacture of commodity products, particularly those in Northern Ireland.

25. It is a matter of debate whether farmers directly exposed to the global market will be cost competitive in the future global pricing environment. The industry also has the difficulty that in a free market raw milk from low cost farmers cannot be prevented from entering the supply chain for fresh products, undermining the premium for security of supply farmers already in this segment of the market may be receiving.

26. This means that for the UK dairy industry to reach its productive potential it needs to pursue two strategies:

- (i) Domestic demand for dairy products of domestic origin has to be maximised sufficiently for these products to earn a premium to cover the costs of production.
- (ii) All farmers should be given every opportunity to maximise their competitiveness.

27. Generally the industry is optimistic that, if it receives the appropriate backing from Government, it can exploit the rising global demand for dairy products and move towards realising its potential. However the development of the industry has to be monitored closely and the Government must be willing to help the sector if the growth in supply from low cost producers around the world undermines the viability of the sector.

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system?*

- Soil quality
- Water availability

28. The dairy industry has no pressing issues with soil quality or water availability. Most dairy production is located in the western part of the UK which receives the highest level of rainfall.



— The science base

29. The dairy industry does not receive sufficient margins to engage in original technological R&D. It is dependent on global food technology suppliers and Government R&D for improvements in the technology that underpins its productivity.

— The provision of training

30. The industry has great difficulty in obtaining the necessary skilled labour and, to a degree, it has become dependent at both the processing and farm level on east European labour.

— Trade barriers

31. Tariff barriers have been declining as a result of the surge in prices forcing countries to cut import tariffs in order to reduce the cost of food supplies to their domestic populations.

— The way in which land is farmed and managed

32. EU environmental legislation governing water pollution will have a serious impact on the UK dairy industry. Some of this legislation is of questionable value. This includes the Nitrates Directive in particular, which an earlier EFRA committee investigation concluded was:

“old-fashioned because it imposes prescriptive rules to achieve its aim, unlike recent EU legislation, which tends to be more flexible”.

33. The value of the Directive is also questionable given the limited improvements that are expected in water quality from its implementation and the fact that nitrate levels are falling already.

34. The problem for the industry is that the implementation of the Directive will impose significant costs as a result of revisions to the England Nitrate Vulnerable Zone Action Programme. This will require major investment in slurry storage capacity by the industry. In addition the Programme places an effective limit on the stocking density that can be achieved by dairy farms. Defra is seeking a derogation that would mitigate the effect of this constraint, but even if successful, the derogation will expire.

35. No precise quantification has been made of the extent to which the Directive will ultimately constrain any future growth in UK milk production but it would be worthwhile for Defra to examine this issue.

*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect?*

36. Over the future time period being considered by the inquiry it can be expected that the consumer trends seen in the past decade will resume and intensify, i.e., growing demand for:

— convenience;

— functional foods;

— ethical attributes (organic, animal welfare, fair trade); and

— provenance.

37. These trends will be underpinned by rising real incomes and a more informed and sophisticated food culture. These trends should provide opportunities for developing added value products.

38. By requiring more product differentiation the effect of these trends on supply chain would be to:

— require a greater flow of information;

— generate much greater integration;

— result in greater dedication of individual farms to certain product types; and

— result in greater complexity.

39. In the short term the current recession has meant greater consumer focus on value. This is undermining the industry's investment in value added products. The organic sector in particular is encountering difficulties.

*What use could be made of local food networks?*

40. Considerable commercial opportunities are available to the industry to meet growing demand for products of local origin. However it has to be borne in mind that efficiency in the dairy industry, both at the farm level and at the processing level, is generated through scale. There is no direct correlation to local supply and environmental and commercial efficiency as transport costs are a relatively small part of total industry costs. Continued concentration of processing into a smaller number of larger plants would unquestionably improve the industry's overall efficiency and reduce its environmental footprint.

41. Climatic reasons also mean that dairy farming and processing is naturally located to the west and the north of the country away from the main centres of population. There is practically no dairy farming left in the south-east of the UK next to London.

42. Local supply is clearly an opportunity for adding value, but the structure of the industry means that the emphasis for the dairy sector has to be on national supply networks.

43. However, it would clearly benefit the industry if the Government supported initiatives that encouraged the consumption of UK dairy products, ie clearer country of origin labelling requirements.

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified?*

44. Government policy interacts with the dairy industry at many levels. The food security agenda and responsible policy making means that the Government should seek to sustain the productive capability of the sector. There are a range of areas where Government policy would enhance the industry's strengths and minimise its weaknesses.

#### *Environmental and Regulatory Costs*

45. The dairy industry is committed to meeting its environmental obligations. The dairy industry is still unique amongst agricultural sectors in agreeing with Defra a Milk Road Map which sets out challenging environmental performance targets for the sector up to 2020.

46. The CAP provides funds for agri-environment schemes that reward farmers for environmental management. However, Defra does not provide funds for meeting new regulatory compliance costs, in particular no grant aid has been made available to help farmers to meet their obligations under the revised England NVZ Action Programme. This compares with the more supportive policies adopted by the devolved administrations.

47. Defra has to recognise that the market place does not provide an automatic mechanism by which regulatory costs are met. If the Government decides to regulate for higher standards then, if it wishes to sustain the productive potential of the sector, it should consider providing transitional assistance.

#### *Labour*

48. The industry is working on a number of initiatives to improve the supply of skilled labour. This includes working with Improve (the Food and Drink Sector Skills Council) and the relevant National Skills Academy in a number of areas, including establishing an innovative, bespoke industry training project for technicians working in the processing sector.

49. Labour recruitment would be enhanced if the industry's image in the eyes of prospective employees was improved. The Government can contribute to this process by showing its appreciation for the achievements of farming and the food sector. In pursuing its environmental agenda it should not portray farmers as perpetrators of environmental degradation, but as guardians of the countryside.

50. Government can also help by maintaining continued investment in the Learning and Skills Council and the Regional Development Agencies to assist in the provision of dairy training.

#### *Research and Development*

51. Dairy UK is very concerned that the current thrust of Government R&D is almost exclusively focused on environmental issues to the exclusion of protecting and improving industry productivity.

52. The biggest threat to industry productivity is animal diseases. Investment in new research in a range of disease threats would benefit the industry, particularly mastitis and Johne's disease.

53. The Government must be ready to evaluate the safety of new technologies, such as GM and cloning, and be willing to proactively defend these technologies if they are proved to be safe.

#### *Other Departments*

54. Other departments and agencies that significantly impact on the dairy industry include:

- DECC
- BERR
- FSA
- OFT/Competition Commission

*OFT/Competition Commission*

55. If the UK dairy industry is to sustain its competitiveness in the increasingly globalised market place that is shaping its commercial future then further industry consolidation is essential. The industry finds it alarming that even relatively minor mergers between small cheese makers are being referred to the Competition Commission by the Office of Fair Trading. This level of scrutiny for industry merger activity represents a serious hindrance to the development of the sector. The evolution of competition policy enforcement in the UK needs to take this in account.

*Food Standards Agency*

56. The FSA is pursuing a number of initiatives that will impact on the dairy industry. This includes a public information campaign on energy and saturated fat consumption. The FSA also wants the dairy industry to reformulate its mainstream products to reduce their fat content.

57. Because fat is a major determinant of taste then this could affect the acceptability of British dairy products compared to imported products. This would place UK products at a competitive disadvantage. This does not necessarily present a problem for liquid milk, where imports are minimal, but it is a serious issue for products like cheese and yogurt. FSA initiatives must be framed in such a way that they do not discriminate against the domestic industry.

58. The FSA should also communicate the positive nutritional benefits of dairy products. FSA policy is overly focused on negative food constituents, such as fat and salt, to the detriment of communicating the importance of a balanced diet.

*Price Volatility*

59. The dismantling of the CAP will expose the industry to greater price volatility. This is destructive of productive potential. Private sector mechanisms do not exist to minimise volatility. Futures markets only allow operators to manage their risk within a volatile environment. At present none exist for dairy. Price volatility is a market failure that needs to be addressed by Government.

60. The EU can still play a role in managing the EU dairy market to reduce price volatility by operating an effective intervention safety net system and by engaging in active market management through the use of export refunds when this is necessitated by market developments. As such Dairy UK welcomes the Commission recent announcement on market support measures.

61. The dairy industry would also unquestionably benefit from the UK joining the euro at a competitive exchange rate. This would remove the volatility created by fluctuations in the value of sterling.

62. The Government also needs to monitor closely whether the process of industry restructuring at both the farm and processing level is sufficient to maintain its competitiveness in a more globalised pricing environment. The Government should adopt a sufficiently flexible and pragmatic approach to policy such that it could reconsider its free market agenda if it proved necessary to sustain the economic viability of the dairy industry.

*What leadership and assistance should Defra provide to the food industry?*

63. Defra should acknowledge its responsibility to sustain the productive potential of the UK dairy industry. At present no Government department has this responsibility.

64. MAFF used to undertake the function of “sponsoring” the dairy industry but Defra, as a matter of policy, has abandoned this activity. Until recently senior Defra officials were stating that the Government was indifferent to the scale of the UK dairy industry.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there coherent cross-Government food strategy?*

65. If Defra is to lead food policy then it needs to achieve a close relationship with the Department of Health and with the Food Standards Agency. Whilst the Agency is theoretically independent of Government, the “creep” in its remit into a wide range of subject areas means that it is essentially taking a political role that needs to be subject to ministerial oversight.

66. The Cabinet Office Strategy Unit report concluded that there was a requirement for a coherent vision for food policy. Defra is taking on this initiative.

67. The Vision for the CAP produced jointly by the Treasury and Defra provides a coherent Government policy on the commercial issues affecting the sector. This policy position, which would reduce the CAP to a rural development policy, needs to be updated to take account of the food security agenda.

68. The CAP needs to be retained as an agricultural policy. A purely rural policy, as advocated by the Vision document, is no substitute. The CAP also needs to continue to play a role in minimising market volatility. The Vision document argues that all market management functions should be discontinued.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

69. Defra needs to monitor production and the extent to which agricultural sectors are meeting their productive potential. The indices put forward by Defra to monitor food security in its discussion document “Ensuring the UK’s Food Security in a Changing World” completely fail to address this issue.

January 2009

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#### **Memorandum submitted by the Family Farmers’ Association (SFS 40)**

We welcome the opportunity to discuss this matter as it seems to us that the “current UK food system” is not at all “robust”. This Association, throughout its nearly 30 years’ existence, has been extremely concerned at the way government support for farming has been steadily diminishing. This applies to both financial and technical support, and especially for family, medium sized enterprises. There has been much encouragement for the enlargement of farms, often to the detriment of the landscape, environment and rural life in general. Indeed there is a strong feeling among grassroots farmers that they are distinctly unwanted.

We accept that there was a period when production incentives were so successful that over production became a problem. However, we agree with your initial analysis that food security is now becoming a challenge. The situation may well remain volatile for a number of years, as so many unexpected events can influence both production and demand for food, and they are rarely well balanced. It does now seem sensible to examine what measures should be taken to ensure long term food security both for ourselves and globally. It may be practical to divide the suggestions into immediate, long term, and global.

The greatest short term problem in Britain is excessive regulation. Government has theoretically recognised this for many years and supposedly attempted to reduce the burden. But unfortunately with no success. It is difficult for mere farmers to know how many regulations are forcibly imposed by the EU rather than Defra but many of them do seem singularly pointless, specifically the recent increase in severity of NVZ rules. The necessity for more storage capacity for slurry will no doubt prove a burden too far for many otherwise viable farmers. As the government is busy handing cash to many businesses, including banks, it is hard to understand why farmers could not be helped with this new liability. (It is not as if the problem has arisen from miss-management, as in the case of the banks!)

The forthcoming insistence on electronic identification for sheep is another prime example of regulation which will cause serious difficulty. How are sheep farmers supposed to pay for the necessary equipment, or even physically cope with it when flocks are dispersed over mountains?

A quite specific problem, which the government has the power to resolve, is the fact that a population of tuberculous badgers is allowed to cause chaos in many cattle keeping districts. It seems the government prefers to kill many thousand cattle, and cause untold misery and difficulties to large numbers of farming families, rather than risk the disapproval of those wildlife enthusiasts who consider badgers to be of supreme importance over all other species, wild and tame. This is really a rather incredible case of government caring not for farming, nor even for common sense, or how much money it wastes. Unfortunately your committee did not take the case against badgers seriously enough when you first studied it some time ago. You might care to re-read that Report and study more carefully the case against the badgers, which was very clearly explained. Since then there has been a lot more evidence of how badgers are spreading TB among cattle.

Other measures which would improve Britain’s ability to produce food include a return to a comprehensive and independent government R & D programme. Present research seems to be mainly for narrow and specific commercial purposes. As well as original research, government should be running trials to produce a true evaluation of such things as organics and Genetic Modification. No genuine comparisons have been made as to whether GM is really beneficial in the long run, or whether it is just increasing because of excessive promotion and the fact that it is what might be called contagious—once established in an area it cannot then be avoided. Will organic production be able to maintain our food supply if/when the oil runs out? Will we be able to produce food in sufficient quantity without using oil or its products? If so, how?

The greatest need is for reasonable prices to ensure that food production is profitable. Three factors mitigate against this. One is the mysterious disappearance of money between the buying of food from farmers, at low prices, and the selling of food to consumers at a considerably higher price. This you have yourselves discovered, and a solution needs to be found, because low farmgate prices do not necessarily produce cheap food in shops. Related to this is the frequent bad behaviour of the supermarket buyers. A proper regulatory control on their trading practices is needed as the buying becomes concentrated in ever fewer hands. The third problem is the importation of cheap food produced to lower standards than are obligatory for home production. We, and many other bodies, have repeatedly pointed out that this is wrong, both ethically and from a public health standpoint. The very welcome rise in beef prices ex farm which

followed the foot and mouth outbreak in South America demonstrated how much our prices can be depressed by cheap imports. Lower welfare standards in Europe produce cheap pig products which are keeping our prices low. Similar instances can be quoted from many parts of the world and for many products.

In the long term our outlook for food production looks poor unless and until there is a sufficient world shortage to provide a strong price incentive for production. The financial return from farming in Britain is now so minimal that increasing numbers of people are ceasing to produce basic commodities. No doubt there will always be imaginative entrepreneurs initiating the production of profitable niche crops, but it is hard to understand why owners of broad acres who receive substantial Single Farm Payments should bother to produce basic crops which are most likely to make a loss. If something is not done to rectify this situation it seems quite possible that food production in Britain could quietly die out, or at least be drastically reduced. It is just not sensible for Defra to suggest that we will be able to farm without subsidies, that Pillar One is not vital, and only Pillar Two is important. On many farms, the only profit comes from the Single Farm Payment. This is a fact which must be recognised.

A reduction of food production may well be brought about by the increasing reliance on highly technical methods. Sophisticated, and expensive, machinery is increasingly being employed, likewise irrigation and large amounts of different types of chemicals, including fertilisers. If/when supplies of these present “necessities” for production become difficult to obtain, it may be found that farmers have forgotten how to manage without them. To a considerable extent these modern aids are a substitute for hard work. But if the present willingness of many farmers to work extremely hard for long hours for a very small return diminishes, who will then produce food? Why has food production, and also its processing, always been among the lowest paid occupations? After all, food is essential to life.

Increased training is often advocated. Why? There is no point in training people to farm unless farming can produce an income comparable to other activities. (At the time of writing, a free lance farm worker is asking £8.50 per hour and a builder/decorator £14!) Who is going to train for farming rather than plumbing or electrical work?

Put bluntly, the profitability of farming will have to increase significantly if food production is to continue in quantity in the long term in Britain. The more so if production is prevented on suitable land in order to encourage wild life. Can we afford to rely almost entirely on imports? We think not.

#### *What can/should Defra do?*

Most importantly of all, it should talk to farmers. It should employ people with farming knowledge and experience, and be headed by Ministers from farming constituencies who are able to talk to their constituents. Many farmers’ sons and daughters now have degrees. They should be active in Defra, ensuring sensible policies. It is quite ridiculous that Defra should have to employ consultants to advise on farming. It should be the source of expertise itself. Until it can arrange to have sufficient expertise in house, it should be talking directly to farmers about their difficulties and making a real effort to understand and remedy the many problems that beset the production of food.

Defra should monitor farming statistics to make sure that the present decline in home production ceases and we no longer waste foreign currency on importing food unnecessarily. Food is going to be badly needed throughout the world.

Defra must also help and advise farmers on how to farm in a wildlife friendly way. Not putting conservation above food production, but studying how the two can be married together. It is not sensible to take prime land out of production, but farmers can be advised which portions of their land can best be left uncultivated, and in a state of nature for wildlife (only very rarely for badgers).

Is it really sensible to have privatised all sources of advice? Advice still has to be paid for out of some purse. Can it be guaranteed to be impartial, or even expert? After the war the National Agricultural Advisory Service (NAAS) did a grand job of helping farmers to modernise and become more productive. Many demonstrations were organised of good practice on successful farms. These proved most useful in disseminating practical information. Now help and advice seem to be fragmented among an infinite series of acronyms, and it is not easy to know where to turn. We do not even have County or Regional Agricultural Directors to answer questions, or otherwise advise us when problems or new policies arise.

Defra needs to put a great deal of thought into how to ensure the continuation of food production on less than perfect land. Farmers whose production is smaller, by virtue of poorer, steeper land, smaller area (which often goes with less productive land), and also young would be farmers getting onto the farming ladder, will need extra support. Land cannot be left derelict and empty of population, just because it is more difficult to farm. Its production will be needed when food gets short.

All land is not suitable for tourism. Well farmed land, especially if populated with healthy livestock, is likely to be attractive to tourists, thus possibly providing extra income. Conversely an abandoned and neglected countryside is not likely to be popular, so that there it is difficult to combine farming income and tourism. “Diversification”, much advocated as an alternative source of income, does not necessarily produce food or care for the environment. How to support food produced on these less productive areas, without

thereby encouraging buyers to pay correspondingly less for the produce is the conundrum that now faces the world, as well as Britain. Something more practical than Pillars One and Two must be devised to maintain food production in difficult terrain.

Globally we must not lapse into the position where highly developed and/or well capitalised nations produce cheap food to feed the world—thereby putting the world’s peasant farmers out of business—in effect abolishing them. At the same time this mass production is destroying forests and causing disastrous climate change. This is the greatest danger we have to face. Present systems are not sustainable and will not produce enough food for everyone forever. Small scale farmers will be needed to produce the shortfall. They must not be destroyed by large competitors. Sensible advice on small scale farming must be available. The problem of rearranging the world’s agricultural economics is too large and complex for the Family Farmers’ Association to solve. But solved it must be if ever more people are not to go hungry. It is to be hoped that, somewhere, there are people who know the answer, and how to put it into practice.

January 2009

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### **Memorandum submitted by the Agricultural Biotechnology Council (abc) (SFS 41)**

#### SUMMARY

1. When given access to the right tools, UK farmers are well placed to supply high quality, affordable food that fully meets consumer aspirations and can contribute to food security—an issue of increasing importance towards the end of the first decade of the twenty-first century.
2. The judicious use of biotechnology in agriculture is reducing the carbon footprint and environmental impact of farming, and must therefore be seen as a tool in the fight against climate change. New traits close to commercialisation will also mitigate changes by climate proofing food crops.
3. Enhancing the nutritional content of food is a priority; reducing the propensity for trans fats in food is already a commercial reality and new products such as omega-3 in soybeans are nearing the market.

#### INTRODUCTION

The Agricultural Biotechnology Council (abc) welcomes the opportunity to provide evidence on the challenges of securing food supplies here in the UK.

abc is the umbrella group for the agricultural biotechnology industry in the UK. The companies involved include BASF, Bayer CropScience, Dow Agrosiences, Pioneer (Du Pont), Monsanto and Syngenta. Our aim is to provide factual information about genetically modified (GM) crops in the UK and around the world and the important role of GM technology in delivering high quality affordable food in a way that minimises the environmental footprint of agriculture.

abc would like to respond to the specific themes of the EFRA inquiry as follows:

1. *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

UK consumers expect to have access to safe, high quality, affordable food that is readily available and which has been produced in an “environmentally-friendly” fashion. UK farmers have been able to satisfy shifting consumer demands by investing in the latest technologies and in turn increasing productivity and reducing environmental and financial costs. UK consumers have greatly benefited from this: the proportion of monthly outgoing spent on food has decreased markedly over the last 50 years and new diet and life-style choices, such as organic or local sourcing, have been catered for.

More recently, the spectre of food security has risen again. As global population dynamics put pressure on the global agriculture supply chain, inevitably prices have risen steeply. Today, food processors and therefore retailers and consumers are faced with unstable and therefore unpredictable commodity prices and as a result many commentators and policy-makers have looked for a solution to the problem. Unfortunately, there is no one solution to food security or food inflation; no silver bullet and no quick fix. The approach to protecting the UK food supply must be integrated and reflective of the complexity of the food security issue. Investment in methodologies to increase agricultural productivity and reduce waste is the key to the future of food supply and Plant Biotechnology, including GM crops, can help form part of the solution by protecting yields and increasing productivity, thereby helping to stabilise food supplies and reduce the rising prices of milk, meat and other staple foods.

In addition, GM crops have a part to play in reducing the environmental and carbon footprint of agriculture, and in the near future, by climate proofing of agriculture with crops that can survive drought and require significantly less fertiliser.

The recent IGD report on consumer attitudes suggests that a majority of consumers are beginning to recognise the benefits of GM crops: 52% of those polled believed that GM can be used to increase productivity and feed a growing world population, with only 13% disagreeing with that view; likewise, 47% of consumers thought that GM can help to protect crops against disease and extreme weather, whereas 12% were not convinced.

Consumers are also looking harder at the nutritional content of their food and are increasingly health conscious. Biotechnology has a clear role in improving the nutritional quality and reducing the allergen content of foods. For example, the provision of vegetable oils with a better fatty acid profile is close to realisation commercially, as are GM varieties of oilseed rape and soybeans are in development with an increased polyunsaturated content.

The problem with such a profile, however is that they tend to be unstable when used in processed food; attempts to stabilise them lead to the production of trans-fats, which are associated with health problems. Oilseed rape and soybean crops have therefore been developed (using biotechnology even if the product is not genetically modified) with an oil profile with a near zero-trans fat potential (low linolenic acid), and have been for sale in the US and Canada for the first time this year. Even more exciting is the development of plants containing long chain omega-3 oil profiles. Nutritionists agree that oils that are high in polyunsaturates are healthier than others, especially if they contain omega-3 fatty acids, and traditionally the only source of these are fish oils. Research teams around the world, however, have succeeded in enriching vegetable oils with this essential fatty acid and soybeans with such a profile will be first to the market and are nearing commercialisation.

*2. What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

Any Government's role, from a regulatory perspective, is to ensure that food entering the market is safe to eat; decisions as to the availability of a product should be left to market forces. The provision of a healthy agricultural sector in the UK is no different. Given the best available tools on the market, UK farmers can meet the challenges of changing consumer preferences and climate change alike. Currently there are no suitable GM crops licensed for use in the UK, despite its use on 114 million hectares of land by 12 million farmers elsewhere in the world.

DEFRA should continue to ensure that UK farmers have access to the tools they need to increase productivity whilst reducing the carbon footprint and environmental impact of agriculture. This will involve leadership at a European level, ensuring that assessment processes for biotechnological products, including GMOs, are rigorously science based and that labelling thresholds for GM products are practical and not restrictively low. abc welcomes Defra's stance taken over these issues recently and hopes that a leadership position will continue in both outlining the potential contribution of agricultural biotechnology and countering potentially prohibitive action from being taken in Europe.

DEFRA must also show leadership in the UK to allow field trials GM crops to be able to be safely undertaken. Currently, UK Government legislation requires those conducting GM crop trials to release a six figure grid reference to disclose the exact location of the trial. This information has to be published in a national newspaper and is readily available on the DEFRA website. Whilst the industry supports disclosure of information transparency, this process is enabling anti groups to actively target those hosting the trials or in many cases attempt to destroy the trial site itself—seen most recently in 2007 in the vandalism of GM trials by Leeds University and at NIAB near Cambridge. Such arrangements deter investment in the UK and many other European countries remain more practical venues to conduct trials. This is potentially putting the UK as risk of being left behind since it is critical to test specific GM traits in UK growing conditions, and DEFRA must therefore take a lead in assessing the effectiveness of the current regulations on disclosure and ensure illegal anti-GM activity is dealt with appropriately. Through specific regulatory changes, abc hopes that Defra will incentivise investment in biotechnological research in the UK and enable crop trials to proceed, which could help Government to realise its farming, health and environmental policy objectives.

abc hopes also that Defra will show Leadership by consistently engaging with all elements of the food industry and ensuring that Government action is reflective of and in response to industry's concerns.

The Food Standards Agency is an increasingly well respected and trusted organisation and its position as a DEFRA agency "independent" of political control is critical to its good name as a food regulator.

3. *How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

Issues central to the future of UK food policy are multifaceted and complex and abc therefore welcomes the publication of the Food Matters strategy and the cross-departmental work being undertaken to realise the Government's objectives. The fact that a number of Government Departments, including DH, DfID and DEFRA, are involved in the delivery of Food Matters highlights that, for the first time, a comprehensive, integrated UK food policy is being developed.

Key policy areas relevant to the future of agricultural biotechnology in the UK require a cross-Governmental approach. For crop trial regulations to successfully facilitate the trialling of GM crops, for example, the Home Office, Defra and BERR are required to be involved, and as agricultural biotechnology continues to be explored as part of the solution to food security we hope that this collaborative approach will continue.

*How robust is the current UK food system? What are its main strengths and weaknesses? How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

Plant Biotechnology, including GM, could be a key contributor to the UK's ability to respond to the challenge of increased food production and could in turn contribute to strengthening food security and tackling climate change.

By protecting yields and increasing productivity GM can help to stabilise food supplies and reduce the rising prices of key commodities; GM can play a role in advancing developing nations' economic progress by increasing yields of food crops such as maize and cash crops such as cotton; and by reducing the environmental and carbon footprint of agriculture and by climate proofing of agriculture with crops that can survive drought and require significantly less fertiliser.

This is achievable on an international level but for this to benefit the UK, UK farmers require access to this technology, which requires a seismic change in the processing of GM applications stuck in the European regulatory system and an ability to carry out field trials without fear of vandalism. Europe has always been a powerhouse of agricultural production, and if this is to continue, the onus on the UK and Europe to increase agricultural productivity has never been greater.

January 2009

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#### **Memorandum submitted by Leicestershire Food Links (SFS 42)**

Our organisation works within Leicestershire promoting locally produced food. We run 5 farmers' markets working directly with local producers.

1. *How robust is the current UK food system? What are its main strengths and weaknesses?*

The main weaknesses are:

- Increased reliance on imports means that home production has decreased substantially and the infrastructure has suffered. Depletion of orchards and market gardens. The number of farmers and farm workers is decreasing due to business failures, low profit margins, poor wages, supermarket practices, transport issues and lack of financial and knowledge based support.
- Reliance on oil. Fertilisers, transport, etc causing an increased demand bio fuels limiting food production.
- Mediocre distribution networks in some areas.
- Climate change—flooding, drought,—failures have large impact on the whole sector.
- Consumer attitudes—supermarket dominated retail environment with all year round range of products, disassociation with rural issues and knowledge of food and its production and preparation, reliance on perceived cheap, quick food, low levels of food education and loss of skills. Businesses have a strong desire to buy local, however they are not willing to purchase locally unless prices are competitive.
- Consumer eating habits -Predominance of meat rich diet large amount of land used for animal feed less land for development of vegetable crops. Dependency on soya, sugars and bulking agents in diet, overconsumption.
- Problems with development versus growing land.



2. *How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

Insufficient information to comment.

3. *In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

*The provision of training*

- Re-introduction of more apprenticeships and specialised part-time courses at colleges for those intending to farm and/or produce food. A new breed of smallholders/hobby farmers/market gardeners lack access to support and training depending on locality.

*Trade barriers*

- Market Charters restricting Farmers Markets. We have experienced problems setting up new markets in Leicestershire because limited permission and/or the fees charged under Local Authority Rival Market policies or because individual Charter holders running a monthly market have refused to hold another during the month. As a not for profit organisation we have not felt that we could risk the expense of legal action on a test case.
- Allotment regulations restricting sale of produce.

*The way in which land is farmed and managed*

- The UK food system will need a complete overhaul. Decisions will have to be made as to whether we revert to a more traditional holistic sustainable way of farming in increased locations or adopt the idea that GM crops are the only method of providing sufficient food. We would not support the latter and hope that the decision errs towards the former.
- Increased number of co-operatives sharing resources and support.
- More land in cities and rural locations made available for food production.
- We would like to comment on the opportunities for people to grow their own food. Allotments allocations have been seriously decreased and are now oversubscribed in many areas. Green spaces have diminished in many town centres for housing development etc and new housing developments offer little space for own production due to land costs.
- To increase the level of support given to smallholders who are currently penalised with planning laws for farming small acreages.
- Introduction of consumer involvement in food production, Community Supported Agriculture, Community Orchards, Abundance projects etc.

4. *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

- Seasonality is supported, with an emphasis on the benefits that local food can bring.
- Education on waste of vital resources continued.
- Current trend due to economic climate is a marked increase in sales of cheaper basic foods and a decrease in organic sales. This may affect the range and amount of local and organic produce sold by supermarkets and as already seen closure of M & S branches.
- Farmers markets will continue to be popular because of
  - (i) environmental issues;
  - (ii) a sense of ownership and community (supporting local producers); and
  - (iii) fresher food and more variety.

However they may experience problems if producers cease to trade or cannot afford staffing and rental costs of stalls with diminishing returns.

Our food culture has changed so dramatically over the last 60 years that it will be difficult to effect change immediately as consumers will still expect strawberries in December. There is an enormous range of imported foods we can currently buy. It is of concern that some of these imports are the life blood of workers abroad. However if more food is grown in the UK it will mean that the market is open for new enterprises to fill gaps. The work of local food networks needs to be researched as they vary considerably but they already have local knowledge of local food production and the issues involved. The CPRE are currently trialling a local food mapping project which will be rolled out later this year. If appropriate the Government must decide if they will offer support to these networks to develop good practice and effect change.

5. *What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

- We have an industry that appears to be in decline so maintenance is long overdue. The average age of farmers is increasing due to the lack of new entrants. The proposition of working as a farmer is not appealing in the current climate. The past reliance on diversification has already shown that farmers have been struggling for many years. Working on a farm is hard work, dangerous and badly paid, housing in rural locations is normally too expensive and transport links may be non-existent—not a good combination for encouraging new workers. However recent research implies that the majority of people regard farmers with respect and would therefore be keen to support them.
- A range of incentives to encourage new entrants to farming would need to be developed to stem the flow from the industry. There needs to be a healthy mix of small, medium and large farms to offer increased choice.

6. *How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

Insufficient knowledge to comment.

7. *What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

Insufficient information for response.

The UK is in a serious position and consumer attitudes to food will have to adapt as each different problem arise whether it is climate change, depleting oil supplies or increased population. We cannot carry on regardless. Many consumers are unaware that there is a problem. The Transition network is in its infancy but is working to explain the issues that Government has to contend with today. Our bank of farmers is dwindling and all necessary steps must be taken to support the industry. Increased legislation and regulations have increased the burden as have planning issues, lack of land for developing businesses in rural areas, limited local services and training opportunities, lack of housing and poor pay. There has been an exodus from the countryside resulting in low levels of knowledge of farming, rural affairs and food origins by many urban consumers. Climate change has already affected harvests and will continue to do so. Oil prices will rise as supplies become less.

- An end to Market Charters restricting trade for local food over imports.
- Increased support for Farmers Markets—a very good mechanism to promote local businesses and activities and to educate and inform consumers.
- Changes in the planning laws to support the set up of small scale food production and development of rural food businesses and improvement of infrastructure—broadband connections, postal services, local shops, distribution networks, transport, low cost housing and training and support opportunities.
- Increased allotment provision and inner city green spaces.
- Removal of restrictions on allotments stopping the sale of vegetables to the public.
- Community Supported Agriculture, Market Gardens and community led projects.
- More local abattoirs to limit livestock travel time and support businesses.
- Increased promotion—Government advocating the consumption and preparation of local and seasonal food with minimum waste to consumers.
- Support of dedicated local food networks to set up food webs, organise distribution networks, providing support and training to new and current producers.
- A range of incentives to encourage new farmers and local producers.
- Stricter monitoring of supermarket practices by Food Standards Agency? Monopolies Commission.
- Increased procurement of local produce in schools, hospitals and supermarkets.
- Financial incentives for producing food.
- Development of partnerships and co-operatives within the local food industries, local government and consumer groups.

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## Memorandum submitted by FARM (SFS 43)

### BACKGROUND

FARM is a nationally based organisation, established in 2002, that represents and campaigns on farming issues. Ours is a democratic organisation, run by volunteers actively involved in farming and it is specifically intended to promote common values and objectives between farmers, consumers and environmentalists.

The NFU (National Farmers' Union) are by far the most influential farming body in terms of their ability to present their view of the challenges ahead within food and farming and how they should be met. The NFU do however represent a very diverse range of farming interests and it is understandably difficult for them to represent all of these in an important process such as this. FARM aims to provide a balance where there is a deficit and this response reflects the views of a significant section of the farming community, which are often characterised as family farms that base their farming practice on traditional values of good animal and crop husbandry. We work closely with both the FFA (Family Farmers' Association) and the SFA (Small Farmers Association).

### 1. INTRODUCTION

1.1 We support the objectives of the Committee in recognising the importance of strategic planning by identifying the role of the UK in securing the long-term future of food supplies both in this and other countries.

1.2 The objectives of increasing food supplies by 50% by 2030 and a total of 100% by 2050 are based on a number of assumptions and guesses. Similar extrapolations in growth could be made of the need to produce cars, electrical goods or virtually any other traded commodity, with the accompanying infrastructures needed to support them. One of the clear messages from the past 10 years is that the model of lifestyle currently enjoyed by the average American or European would require between three and eight planets in order to sustain our current world population, let alone any increase.

1.3 Therefore the most important objective must remain one of sustainability. Although we welcome this inquiry, we recognise that there are inherent dangers in accepting the FAO report's assumptions of population growth, increasing prosperity, and the future demand for food, as well as accepting the predictions of the FAO report as an objective that must be met at all costs. We suggest that the most responsible objective should be that of increasing production as far as necessary to meet production shortages, but to do so in a way that does not deplete non-renewable resources, reduces current levels of pollution and stabilises the man-made effects of climate change.

### 2. CONFLICTING OBJECTIVES

2.1 We believe that farming within the UK has the potential and ability to meet any realistic challenge of producing food and other products required of it and to do so to the highest standards. Equally, we believe that ability can be seriously compromised by a lack of clarity concerning the objectives and by a confused array of interpretations of the various means by which they may possibly be achieved.

2.2 Farming is currently being asked to respond to a bewildering number of objectives, some of which are often difficult or impossible to reconcile. Furthermore these objectives (in particular those of production and the environment) change within relatively short periods of time, depending upon the prevailing economic climate. This can lead to significant levels of uncertainty that affect farming business, which in turn adds considerable doubt to areas of business planning and the investment required to make the necessary changes to prepare for future challenges.

2.3 We therefore believe that it is vital that Government policy and how that is implemented through the work of its various departments and agencies begins to form a more coherent strategy. In recent years, the work of the Treasury and the Office of Science and Technology appears to reflect a strategy for food and farming that is based on international commerce and the knowledge economy. This has often appeared to have little in common with the more immediate practical farming challenges upon which the Environment Agency and DEFRA are focussed. Without a coherent strategy, our farming businesses will increasingly find that what constitutes good business practice and what constitutes good farming practice will become even further detached.

2.4 The principal objective of feeding an increasing world population presents farming with a clear challenge, but we recognise that it presents a significant opportunity for those in other areas of the food chain to promote potential solutions that would benefit their own preferred business model. It also provides an opportunity for countries such as the UK to promote technology as the central pillar for delivering change in farming, and to reap benefits through the knowledge economy without fully understanding the impact that the technology will have when applied. In our experience, the Government tends to overestimate or over-promote the benefits of technology and to under estimate potential negative impacts.

2.5 It is therefore not surprising that with so many vested interests competing for their voice to be heard, that the needs of both producers and consumers (particularly in developing countries) have become so distorted when articulated through business and politics, especially when complex scientific issues are selectively reduced to convenient “yes?” or “no?” fragments.

2.6 Both the Government and its Departments must recognise that the free market is not going to deliver the sort of sustainable models of agriculture needed to provide food security whilst also supporting the countryside and the wider rural economy.

2.7 With these points in mind, we therefore urge the government, through this enquiry, to make the recent IAASTD (International Assessment of Agricultural Science and Technology for Development) reports the central pillar upon which to base future strategy. Within the findings of the report, we recognise the importance of considering social and economic factors as an integral process of developing appropriate technologies. The relatively muted response by the Government and industry to the findings of this report has been a disappointment and we believe suggests an increasing disconnect that has developed between science and those whom it is intended to serve.

### 3. THE STRENGTHS AND WEAKNESSES OF OUR CURRENT POSITION

3.1 Through our work in recent years, we have identified the four areas of most concern as being those of scientific research and technology development, education and skills, the role of commerce and finally the problems of balancing production with responsible environmental stewardship. Although our response reflects the situation in the UK, the same four areas are often quoted as being of equal importance in both developed and developing countries.

3.2 There have been a number of recent reviews concerning the role of science, conducted by both the Government and parliamentary groups. However, within the area of agricultural science and research there appears to have been little change in the way that science is funded, guided and interrogated. Amongst the consultations that FARM has been involved in is a review of DEFRA science, conducted by the OST (Office of Science and Technology). In this and other similar reviews, it has appeared to us that the value of science is treated as the end in itself and measured in purely economic terms. Public trust in science continues to be eroded by the increasing commercial ties developed with business and this is particularly the case within food and farming. In order to meet the objectives of sustainability set out within the IAASTD reports, we feel that a radical change is required in the way that science is funded, procured, evaluated and applied.

3.3 As the number of those employed within farming has declined, colleges and other centres of learning have changed the courses that they offer to reflect a more diverse range of non-farming enterprises. Currently we do not have a strong educational base upon which new entrants can be encouraged into farming and those already within farming can access the necessary ongoing training that reflects the changing nature of farming businesses.

3.4 The tendency for farms to work as independent businesses is a distinct weakness, particularly on smaller farming units and it leads to an unnecessary proliferation of machinery and other resources that could otherwise be shared with compatible businesses. Many farmers are capable of running their own farming businesses with a high degree of confidence, but their ability to engage in effective collaborative partnerships, inter-business dealings or effective marketing strategies can often prove to be poorly developed. It is within business relationships where there is the greatest imbalance of negotiating power, such as dealing with supermarkets, where the need for greater collaboration and cooperation is most needed.

3.5 Although a great deal of attention is placed on the ability to produce food, IAASTD makes the important point that the ability to afford food is of equal importance, if not greater. Within the UK, food still accounts for a relatively modest proportion of expenditure for most families, but at the lower end of the range of incomes, the ability to afford enough food to survive is an ongoing challenge. Therefore, fluctuations in food prices are something that can have a profound effect on the ability to access food both in developed and developing economies. We recognise the arguments made in support of futures trading in agricultural produce and the role of food within commodity markets, but we have also seen severe short-term fluctuations in price of major food staples that have more to do with perceptions of shortage than any real threat to supplies. Earlier in this submission, we referred to the undermining effect that uncertainty has on the ability to plan farm business and to make the necessary investment in infrastructure. Whilst some might argue that variations in commodity prices such as wheat, milk or beef are inevitable in today's global market, we see them as a significant threat towards planning our food supply and the ability to produce it when it is most needed.

3.6 In the introduction to this consultation, the EFRA Committee makes reference to the increasing demand for meat and dairy products, particularly in developing countries such as China and India. We feel there is an important distinction to be made between the role of livestock within farming systems: As grazing animals they provide a useful means of turning a non-food crop such as grass, into a variety of useful products including meat, milk and wool, whilst at the same time playing an important role in the maintenance of uncultivated areas of farmland. This is in stark contrast to the intensive production of livestock, where high-protein and high-starch diets are used as the principal sources of feed, and because animals are kept in purpose built housing, they have little or no role in the management of uncultivated

areas. The efficiency of livestock to convert protein crops that could otherwise be used for human consumption (for instance wheat or soya) is relatively poor and production of both crops to feed livestock and the rearing of the livestock themselves involve a considerable quantity of water and energy. We believe that a more sustainable approach to livestock production within the context of the FAO targets of increasing populations and shifts in diet is one where ruminant livestock are reared on a grass- and forage-based diet that is grown on land unsuitable for food crops.

3.7 The need for a balance between production and responsible environmental stewardship has been further complicated by a similar need to prioritise land use between fuel and food. There have been a number of recent suggestions that in order to deliver the sort of production increases suggested by the FAO, we would not be able to also afford the luxury of environmental management. We do not believe that production and environmental objectives are as irreconcilable as this position would tend to suggest. In recent years, farmers have successfully adopted a range of integrated crop management techniques, whereby good environmental stewardship is integrated within crop management. There is considerable scope for continuing to build on this success, given the necessary research and support.

3.8 We also believe that there should be an opportunity for any productive farmland to be farmed and therefore we have welcomed the removal of the requirement for land to be set aside from production. However, farming continues to lose valuable capacity, as good productive land is lost to development, infrastructure and leisure use.

#### 4 SUMMARY

4.1 The FAO objectives of increasing food supplies by 50% by 2030 and a total of 100% by 2050 are based on a number of assumptions and guesses that we believe may not withstand scrutiny in the light of recent events within the global financial system.

4.2 We believe that DEFRA needs to take on board the recommendation of the IAASTD that an over-reliance on some of the new biotechnologies may not help in the challenge of increasing food production. As food producers we need access to well funded research over the full range of technologies—genetic, cultural and mechanical—to assist us in meeting the challenge of ensuring a proportionate level of national food security from limited or decreasing resources.

4.3 In summary, the most important role that we believe the UK farming sector can play in contributing towards the future needs of a growing world population is to use its inherent skills and ability to develop sustainable systems of farming and to lead by example.

#### FARM

*January 2009*

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### **Memorandum submitted by the British Retail Consortium (SFS 44)**

#### 1.0 EXECUTIVE SUMMARY

1.1 The UK has a robust supply chain based primarily on UK production, supplemented by imports.

1.2 Changing global demand and supply challenges will increase the volatility of food prices and will challenge retailers in the UK.

1.3 As the majority of our food is produced in the UK and Europe, European policy as much as global policy is key.

1.4 Although long term changes are those usually identified, short term problems such as animal disease and interruption in the supply chain pose an immediate threat to the supply of food in the UK.

1.5 The Government needs to better appreciate the importance and operation of food production and the supply chain.

1.6 Government intervention can have a major impact on the supply chain.

1.7 Defra needs to improve its practical understanding and support for food retailers.

1.8 Government needs to improve co-ordination and prioritisation of food policy.

## 2.0 INTRODUCTION

2.1 The British Retail Consortium (BRC) is the main trade association for retailers, and our members are responsible for approximately 80% of all grocery sales in the UK.

2.2 Retailers take a keen interest in the long term issues affecting food production. The UK food market is extremely demanding, where consumers expect affordable food and take an interest in its production and impact on the environment. It is key, therefore, that all retailers plan for the changes in global demand and production that affect our supply chain.

2.3 Retailers recognise that a highly efficient just in time supply chain can also be a vulnerable one and have invested heavily to ensure its robustness. This has been tested by a number of incidents in recent years, including GM contamination of the primary source of rice and several animal disease outbreaks. It is also clear from work with the Cabinet Office that the large food retailers are amongst the most advanced businesses in terms of planning for emergency incidents, such as a pandemic flu outbreak.

2.4 The BRC evidence deals primarily with the issues that we consider are relevant to the continuing robustness of the supply chain from a retailer perspective.

### 3.0 *How robust is the current UK food system? What are its main strengths and weaknesses?*

3.1 The current food system is extremely robust for a number of reasons. Firstly, we should remember that the majority of food sold in UK stores is produced here. The BRC collated figures for the now defunct Organic Action Plan which showed the high proportion of home produced food sold in the major UK supermarkets. For example, in the year ending 2006, 100% of eggs, 100% of milk, 90% of fresh chicken, 89% of beef, 70% of lamb and 96% of carrots sold in major supermarkets were all produced here. Further, as shown in the Defra report (Ensuring the UK's security in a changing world, July 2008) 68% of our food imports come from within the EU. We believe this demonstrates our supply chain is founded on production in "safer" countries in terms of their robustness. It also demonstrates how influential EU policy is on our supply chain.

3.2 Secondly, retailers have improved the robustness of their chains through investment and working closely with their suppliers. Sophisticated traceability systems and co-operation with suppliers means problems such as contamination are minimised and the chain can react quickly to issues such as animal disease. The supermarkets have long term relationships with the majority of their suppliers, which means they have grown their businesses together forming a strong partnership. The UK has faced a number of problems in the last few years but the impact on the supply chain and consumers, due to supply chain relationships, has been minimal.

3.3 Thirdly, through excellent contingency planning the supply chain is flexible enough to react to interruptions in supply. For example, when the primary source of long grain rice, the USA, experienced problems with GM contamination, retailers had to quickly switch to alternative suppliers but all were able to do this without affecting availability. One point to remember is that UK customers expect high levels of production, which means retailers have to substitute with similar products, it is not simply a case of buying the cheapest alternative on the open market.

3.4 The weaknesses in the chain are generally due to two factors. The first is where the interruption is outside the retailers' control, for example, industrial action such as fuel strikes, where despite planning there will be problems if the Government doesn't intervene. The second is the implementation of Government policy and legislation. The current slow progress in approval of GM varieties of maize and soy in the EU will have a major impact on the availability of animal feed and threatens the future production of livestock in the UK. During animal disease outbreaks and recent contamination cases we have also seen how Government decisions on withdrawal of products and controls on imports and exports can have a major impact on our supply chains.

### 4.0 *How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

4.1 Retailers are committed to securing sustainable products, as demonstrated by their commitments to the BRC initiative "A Better Retailing Climate" to reduce the environmental impact and vulnerability of the supply chain. We are committed to ensuring that increased production is sustainable.

4.2 We believe it is more appropriate for those in the primary sector to comment on increasing production, but we do believe that the production of food has not been given sufficient priority in recent years in the UK. In particular, we need to increase support for research and development of increased production that is sustainable.

4.3 Retailers have demonstrated, working with their suppliers that it is possible to meet the challenges of production to meet UK demand whilst considering issues of sustainability. Retailers have led the way to tackle issues such as responsible use of palm oil and responsible production of soya outside the Amazon biome through protocols they have agreed with suppliers.

4.4 Through initiatives such as these the UK has developed an expertise in sustainable development that could be promoted globally.

4.5 As well as increasing production, there is also considerable scope to improve our use of existing production. Food waste remains a major challenge. In the UK recent reports have demonstrated the volume of waste, particularly by consumers. Food waste is a major problem in supply chains in developing countries. This could be an area where the UK, through DfID and FAO could use its expertise in supply chain management to reduce waste through improvements in transport, packaging and storage.

*5.0 In particular, what are the challenges the UK faces in relation to the supply side of the food system*

5.1 Water Availability. This will be a challenge as the demand for water increases, coupled with the impact of climate change. Action has already been taken in the supply chain to reduce water consumption, but this has primarily been in the processing and retail sectors. More focus will be needed at the primary level, in improved use of water, both in general production and irrigation. We do not believe some of the focus on embedded water in dairy products and meat is entirely relevant as the systems of production are often appropriate to their climate and geography. We also believe that consumers are some way off an understanding of the importance of water use and the impact of various agricultural systems on water consumption. It is difficult, currently, to see how consumer demand could influence production to improve water availability which means improvements will rely on the supply chain working together, without a clear added value to the producers. It is more likely that the economic cost of water will have an impact on demand through higher prices.

5.2 Marine environment. It is clear there will be increasing pressure on fish stocks in the future. There are several challenges for the UK. Firstly, can we increase alternatives to current favourites that are under pressure, such as promoting less fashionable species? Secondly, can we increase farmed species, which can be successful but can bring their own problems such as disease and impact on the environment? Finally, can we manage our existing stocks in a more sustainable fashion to ensure their long term future? In all of these areas, the UK has made progress and we will see further activity by retailers to promote alternative species and support schemes such as the MSC but it is difficult to see what difference these will make in global terms, unless others also act.

5.3 Science base. In terms of increased production and sales based on new technology such as animal cloning or GM food this is unlikely to be driven, in the medium term at least, by consumer demand. Consumers in the UK are not demanding these products as they see no benefits for them and have accepted negative comments made about them. We believe, however, it is important that the UK continues to invest in our science base to ensure we are able to improve our supply chain, in areas such as food waste management, animal disease control and sustainable farming. These are major challenges for the food industry, bearing in mind its substantial impact on the environment, and requires investment from Government, agreement on priorities and collaborative work with the supply chain.

5.4 Trade Barriers. There are three areas where we believe short and longer term trade barriers will be a challenge for the supply chain. Firstly, countries reacting to volatile price changes by imposing export conditions on commodities. Although this has not yet lead to major problems, kneejerk reactions such as these may become more common in the future. Secondly, the EU approach to GM approval will cause a major problem on the import of animal feed in future years as the rest of the world grows new varieties of soya and maize. We believe this barrier, imposed due to delays in legislative approval, will have a major impact on the availability of animal feed and the production of livestock in the EU. This could result in livestock production being transferred to non EU countries where animal feed is available. Thirdly, short term trade bans on the movement of meat and meat products during animal disease outbreaks cause significant problems to retailers, particularly as Northern Ireland is seen as an export destination. Our supply chains operate 24/7 and disruption to trade, brought in at short notice, can have a significant impact on food availability. We are likely to see an increase in exotic disease and must find a pragmatic way to control animal disease spread, recognising the need for trade.

5.5 Farmed land. We will see challenges from the environmental impact of land management, including issues such as water and soil management. We believe policy makers need to put sufficient weight on food production compared to environment issues. We have an example of that in the current discussions in Europe on pesticides regulation. We asked for decisions to be postponed until an accurate regulatory impact assessment was prepared to examine the affect on production and prices but decision makers have continued to discuss the proposal ignoring this.

*6.0 What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be the main effect? What use could be made of local food networks?*

6.1 Consumer demand will continue to evolve in future years. There will continue to be more interest in the provenance of our food, its production and sourcing, but these will still lag behind the key drivers of consumer choice, taste and price. The key issue, as graphically demonstrated in the current market, is value, which doesn't preclude issues of provenance but means they must be clearly appreciated by consumers alongside price.

6.2 One interesting impact of the current financial problems and temporarily higher prices has been an increase in cooking from scratch and an appreciation of the value of food. If this continues, supported by increased knowledge of cooking we could see an increase in interest in the sourcing of food and food knowledge.

6.3 Retailers already have a good record on national and local sourcing, this will continue as will support for groups of dedicated suppliers. Using dedicated suppliers has a number of benefits. Not only does it allow them to work with a group of suppliers to react to the challenges of improved environmental management, it also has benefits for food security through continuity of supply and improved surveillance for potential problems.

*7.0 What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

7.1 Although the operation of the supply chain in the UK is largely a private sector issue, the Government can have a significant influence and impact on its operation. It is important the Government understands the influence it has and the impact of its decisions.

7.2 To play any role, Defra needs to improve its understanding of how the UK supply chain operates, particularly beyond the farmgate. This would help it appreciate how decisions it takes on policy and the implementation of legislation affects the supply chain.

7.3 Defra needs to recognise and support food production in the UK which is at the core of our supply chain. It must ensure that it balances support for research and development across all the areas for which it is responsible, including food production. In a similar vein, it also needs to ensure that when taking policy decisions it accounts for the need for a productive agricultural industry within its environmental policy.

7.4 Defra and the Food Standards Agency should continue to take a lead in Europe to ensure we have the policy and legislation framework appropriate to ensure food security. We have been encouraged by the UK Government's approach to recent issues such as resolving trade problems during animal disease outbreaks and the problems of the current GM policy, but we need this to continue. A key issue is understanding the eventual impact through enforcement of what can appear to be minor points in European legislation on the efficient operation of our chains.

7.5 To show leadership in the food industry, Defra needs to demonstrate it both understands and wants to work as partners with it. Currently, we do not believe that food supply is at the heart of Defra's work and do not receive the support we require. This is compounded by the lack of prioritisation of policy, which means the industry is trying to cope with delivery of a range of diverse issues at a time when it is struggling with increased cost pressure and an extremely challenging market.

*8.0 How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

8.1 Defra needs to improve its engagement with other departments and abroad in the issues that concern retailers. Although we accept Defra is not responsible for the majority of food regulation we would like them to sponsor our sector and challenge other departments that have an influence over us.

8.2 Defra has set up a food information better regulation group which involves industry and other departments but we are yet to see tangible outcomes from the group, in terms of prioritising UK support for lobbying in Europe.

8.3 The Government published Food Matters in July 2008 which set out its objective of improving co-ordination of food policy. We were most interested in the food strategy taskforce which brings together key officials from all the departments to discuss food policy and improve co-ordination. Although it is still in its infancy, we are yet to see any positive outcomes from this group. Retailers want to see improved prioritisation of policies, understanding that the sector is under pressure and has limited resources to cope with multiple requests from Government and an improved recognition of the paramount influence of consumers.

8.4 There is also the Cabinet Sub-Committee which will also consider food issues. We feel these two groups should be capable of improving the co-ordination and prioritisation of food policy but they would benefit from input from the sector to identify problems and suggest how Government could lend practical support.



9.0 *What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

9.1 The BRC supports Defra's current work to develop indicators of the UK's food security. Those indicators are still under discussion so it is difficult to speculate on their final content.

9.2 The indicators in the draft Defra document cover global issues on production and factors that underpin it such as research spending, and would appear to be the best way to monitor this issue. Although UK production is important we are a relatively small, already efficient country so it is difficult to see what part we can play in doubling global production.

January 2009

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### Memorandum submitted by Kraft Foods UK & Ireland (SFS 45)

#### COMMENTS FROM KRAFT FOODS

1. Kraft welcomes the opportunity to participate in the EFRA Select Committee Inquiry and is keen to remain engaged in the debate about food security in the UK. In accordance with our involvement in the debate, this response focuses on three of aspects of the Committee's inquiry: upcoming consumer trends and their impact, governmental co-ordination on food policy and the criteria DEFRA should use to monitor its activity on food security.

#### *About Kraft Foods*

- Kraft Foods is one of the world's largest food and beverage companies, producing chocolate, coffee, cheese and biscuit products for the UK market.
- We have about 1500 employees in the UK and Ireland, including Cheltenham (headquarters) and Banbury (coffee processing factory and R&D).
- Our major UK brands include *Philadelphia*, *Dairylea*, *Kenco*, *Carte Noire*, *Terry's Chocolate Orange*, *Toblerone*, *Oreo* and *Ritz*.
- At Kraft, our challenge is to make sustainability a part of every business decision we make. To help prioritize our sustainability activities, we are focusing on six areas where we can have the greatest impact and that have the greatest impact on our business: agricultural commodities, packaging, energy, water, transportation & distribution, and waste. Further information on Kraft's sustainability initiatives is included at the end of this submission.

#### *Consumer trends and their impact on sustainability*

2. As the Committee would expect, Kraft regularly reviews market data covering a range of factors, including consumer tastes and habits. The Committee has rightly identified that these factors are important for their impact on sustainability challenges. Evidence on what specifically this impact will be is inconclusive, but we have noted below for the Committee's information some relevant findings:

3. In the short to medium term, the worsening economic climate is having a real impact on consumer confidence. Due to this, the price of goods will remain a high agenda point. Many customers are changing their spending habits, looking carefully at what they buy, as well as when and where they buy it.<sup>120</sup>

4. Value is a key priority—consumers are keenly looking for offers and deals that represent stronger value for money. Overall, there is evidence documenting the importance of value to consumers generally and how the importance of obtaining value increases during times of an economic downturn.<sup>121</sup>

5. For many shoppers, they will increasingly have to re-evaluate their quality-price priorities.<sup>122</sup> Consumers continually make trade-offs when deciding what products they buy, depending on their individual circumstances and the type of products that they are buying. However, consumers' purchase interest and value perceptions for new products do not change significantly with changes in the economic climate. Products must still satisfy consumers' needs<sup>123</sup> and products that manage to tick a number of different attributes e.g. health, premium, convenience will be more successful in a declining economy.

6. In light of the recessionary environment, there is speculation about whether ethically sourced products which have been popular in recent years e.g. organic, or certified products such as Rainforest Alliance and Fairtrade, may suffer. However consumers concerned with sustainability show greater commitment to their purchases than their more neutral peers and consumers often buy these products because of perceived

<sup>120</sup> State of the Nation 2008.

<sup>121</sup> Recessionary Consumers & Product Choice—New Consumer Insight Series—June 2008.

<sup>122</sup> State of the Nation—Category Trends 2008.

<sup>123</sup> The role of innovation during an economic slowdown—Nielsen 2008.

performance benefits. Evidence is not conclusive but research indicates that ethically sourced products should remain relatively resistant (at least in the short term) but attracting new users to these products will be a more difficult challenge.<sup>124</sup> In addition, a number of brands such as Kenco/ Rainforest Alliance are offering ethical sourcing at no extra cost to the consumer.

7. The economic climate can highlight sustainability issues, such as food waste, as saving money and environmental concerns can work hand in hand as people try new ways to waste less food.<sup>125</sup>

8. There is a possibility that there will be renewed demand for basic ingredients as consumers try and find ways to save money by cooking from scratch—opting for ingredients rather than potentially more expensive pre-prepared options is a potential consumer strategy during a downturn.<sup>126</sup>

9. Consumer may look at innovative and different ways to purchase food e.g. increased access and ability to use internet shopping, and changing fuel costs may make this option more financially and environmentally attractive. People may also complement their regular grocery shopping with top-up shopping from local facilities, providing potential opportunities for local food networks.<sup>127</sup>

#### *DEFRA's work with other departments and inter-governmental bodies*

10. We welcome DEFRA's participation in the recent PMSU "*Food Matters Towards a Strategy for the 21st Century*" report and believe that it was an important step to create an integrated cross-government approach to food policy, which is needed to avoid setting contradictory objectives.

11. It is appreciated that DEFRA has close links with European bodies and the UK actively works with the Commission and Parliament. It is very important that DEFRA coordinate with development agencies. Many of the goods that consumers buy in the UK rely on commodity production in the developing world e.g. Kraft products use agricultural inputs grown in the developing world such as cocoa, coffee and cashew nuts.

12. Kraft Foods believes that addressing the global food security crisis requires engagement of governments and international organisations. Development, trade and agricultural policies should have international co-ordination, focus on removing market distortions and promoting agricultural production in developing countries and supporting supply chain efficiencies.

13. In particular old policy objectives that may conflict with new priorities should be reviewed e.g. in light of the food security threat, removing traditional barriers to trade would benefit developing world farmers and increase the world's ability to feed itself. Specifically with regard to development policies:

- Focus needs to be on market-based agriculture in the developing world in order to break the cycle of hunger & poverty (development has always started by restructuring productivity in the agricultural sector and incomes in rural communities).
- Build infrastructure (e.g. transport) as a way to promote market linkages and enhance supply chain efficiency. This should complement and support private sector investments.
- Micro-finance: microcredit, credit, savings and insurance products for farmers and primary processing sector.

#### *Criteria to measure the UK's response to the challenges of food security*

14. Kraft believes that DEFRA correctly identified the challenges facing global and UK food security in its paper "*Ensuring the UK's Food Security in a Changing World*". Population increases and subsequent increases in the demand for food have led to even greater demands on natural resources. The ambition is to deliver enough food at prices that people can afford to pay, from environmentally, socially and economically sustainable production systems.

15. Our response to DEFRA's consultation on Food Security highlighted that all strategies to address long term supply and demand challenges should adequately monitor social and environmental effects as well as the traditional economic effects and associated indicators such as price and supply data. With this in mind, it is our view that DEFRA should include the following criteria in measuring the UK's response to the challenges of food security:

#### 16. *Economic Criteria*

- *Price*: Criteria should focus upon economic indicators that reflect changes in the stability of food supply and effects on price: real commodity prices, share of UK imports, stock ratios, volatility and price inflation indices.

<sup>124</sup> Recessionary Consumers & Product Choice—New Consumer Insight Series—June 2008.

<sup>125</sup> State of the Nation—External Environment 2008.

<sup>126</sup> Recessionary Consumers & Product Choice—New Consumer Insight Series—June 2008.

<sup>127</sup> State of the Nation 2008—Future Trends.

- *Horizon scanning*: As part of this, we would urge DEFRA to undertake regular horizon scanning exercises, looking for factors that may have a long term effect in order to anticipate trends that will affect food security in the future e.g. structural changes in commodities markets or environmental conditions.
- *Trade*: DEFRA must maintain a global outlook in their monitoring and look at the global food supply in addition to just the UK supply. As a global company, Kraft buys raw materials from a wide variety of sources—we support this theme as a key element towards ensuring food security. The elimination of barriers to trade which can have market distorting effects is important, for example, the reform of the Common Agricultural Policy to liberalise markets and reduce/remove production controls.

#### 17. Environmental Criteria

Environmental and social factors can have a big impact on securing stable food supplies. DEFRA should include certain factors in their analysis of UK's performance against goals:

- *Water (Availability of Water and Impacts on Water)*: The food industry relies on a constant supply of clean water—it is a major ingredient and is a key element of many food production processes. Industry's highest usage of water is in agriculture which accounts for around 37% of Europe's fresh water consumption according to the Confederation of the Food and Drink Industries of the EU. Policies to increase food supply should measure the effect on the availability and quality of water as a result in changes in the farming and processing of food.
- *Energy and the carbon impact of increasing food supply*: Carbon dioxide and other greenhouse gases can have a negative effect on the environment and climate change and should be a key measure to monitor whether the UK is increasing food production in an environmentally sustainable manner.
- *Biofuels*: The impact of biofuels should be acknowledged at a global policy setting level. Kraft welcomes the UK Government's recent reports on the potential impact of increased biofuel production on food output. A cautious approach should be maintained on this issue, taking full account of sustainability factors and prioritising non-food sources of biofuel.
- *Land use (availability of arable land)*: In both the UK and developing countries, availability of arable land will greatly determine capacity for the food industry to supply growing demand. Measuring the impact on land, e.g. deforestation, will also provide guidance towards ensuring that increased production is sustainable.

#### 18. Social Criteria

- *Social Cohesion*: shortage of food and competition over natural resources (water, energy) can lead to social unrest. DEFRA should develop criteria to measure effects of food policy on community and social cohesion in both the UK and developing countries.
- *Labour trends/migration*: the availability of labour and appeal of farming in rural communities is an important factor in ensuring we can continue to meet future demand. With this in mind, the policy framework for farming is important.

Kraft Foods is fostering the advancement of sustainable agriculture to deliver social, environmental and economic benefits in areas it sources key commodities from (see Appendix).

#### 19. Technology Indicators

- *New Technologies*: At a global level, Kraft supports a science-led debate on new technologies that together with widespread adoption of good agricultural practices could stimulate increased food production, particularly in developing countries. DEFRA could benefit from monitoring societal attitudes to potential methods and impacts associated with new technologies that increase food supply.

#### 20. Summary

DEFRA should take a long term and global view in its approach to food security. In DEFRA's discussion paper on "*Ensuring the UK's Food Security in a Changing World*", the supporting indicators highlighted were predominantly short-term economic indicators. However, in order to assess food security effectively over time, analysis of medium and long-term future trends will also be important, as will a holistic approach taking account of social and environmental factors in addition to traditional economic indicators.

*Kraft Foods and Sustainability:*

At Kraft we are focussing our attention on areas where we can make the biggest difference:

- reducing energy use, water use and greenhouse gas emissions;
- reducing waste from manufacturing facilities;
- reducing packaging materials; and
- increasing sustainability in agricultural sourcing e.g. coffee and cocoa.

To find out more please visit: [www.kraft.com/About/sustainability](http://www.kraft.com/About/sustainability)

*Energy:*

Kraft Foods' global target is to reduce CO<sub>2</sub> emissions by 25% between 2005–2011.

Kraft Foods UK & Ireland's coffee manufacturing facility in Banbury, UK has been investing to contribute towards this target:

- New equipment (energy efficient mechanical vapour recompression evaporators) has been introduced to concentrate coffee liquor for soluble coffee processing, resulting in less waste and improving energy efficiency by 27%.
- Spent coffee grounds are incinerated from soluble coffee processes to produce energy and improve efficiency.

Between 2000 and 2008, CO<sub>2</sub> emissions have been reduced by 19%, and Banbury continues to invest in energy reduction projects and renewable energy sources.

*Water:*

Kraft's global target is to reduce the company's water consumption by 15% between 2005 and 2011. We look for opportunities to reduce our water use and minimise the impact of water.

*Commodity Sustainability*

At Kraft we aim to enhance the communities we source commodities from and do business in. We believe a sustainable approach to commodity sourcing—based on environmental, social and economic responsibility—has a major role to play in protecting food security.

We have sustainable sourcing initiatives in the key commodities of coffee and cocoa. We are engaged in efforts to promote long-term coffee sustainability via our partnership with the Rainforest Alliance ([www.ra.org](http://www.ra.org)) and our membership in the Common Code for the Coffee Community ([www.4c-coffeeassociation.org](http://www.4c-coffeeassociation.org)).

The Rainforest Alliance is an independent, non-profit international organisation. The Rainforest Alliance Certified™ programme assures consumers that the products they are buying come from farms that meet demanding standards for environmental, economic and social improvements.

We understand that our consumers are increasingly demanding high quality, sustainably sourced products that make a tangible, positive difference to the quality of life for farming communities and environments. We also depend on coffee farmers' long-term ability to provide the quality and quantity of coffee beans that can help us meet the demands of our consumers.

Kraft Foods is the largest buyer of Rainforest Alliance Certified coffee in the world. Promoting coffee sustainability helps improve the environment, as well as economic conditions of local communities in which crops are grown—the Rainforest Alliance estimates that our purchases of coffee from certified farms ensured the sustainable management of 101,311 acres of farm and forestland; and benefited more than 205,000 farmers and their dependents.

In the UK, Kraft has set the goal of converting the entire Kenco coffee range to using Rainforest Alliance Certified™ coffee by 2010. We source cocoa from Rainforest Alliance Certified farms in Cote d'Ivoire and earlier this year launched Rainforest Alliance Certified *Suchard* hot chocolate.

In addition, Kraft participated in setting the Common Code for the Coffee Community, a multi-stakeholder initiative that seeks to establish baseline sustainability standards for mainstream, non-certified coffee markets.

*FDF's Five Fold Environmental Ambition*

Kraft UK & Ireland are also participating in the Food and Drink Federation's *Five-Fold Environmental Ambition* which aims to make a collective contribution for the food manufacturing sector in the UK.

January 2009

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**Memorandum submitted by the Institute for Animal Health (SFS 46)**

EXECUTIVE SUMMARY

Meat, eggs and dairy products are a major part of the UK diet and infectious diseases have a major impact on the efficiency of livestock production with huge losses caused by chronic, sub-clinical episodes of disease.

New disease scenarios are expected with changing UK agriculture/farming practices; changes in climate, demography and land use; increasing international movements; and a greater preference by the consumer for non drug-based methods of disease control.

Control of disease is absolutely essential for some sectors of livestock production, principally the intensive production of broiler chickens. In the absence of effective vaccines or drugs, the major pathogens of poultry would be uncontrolled, cause high rates of mortality and prevent large-scale poultry production.

Defra must continue to invest in the control of important livestock diseases, be prepared to ensure the long-term availability of key scientific and technical skills and adequately support the provision of key infrastructure.

Defra must continue to provide leadership in research for better control of disease. Current funding models within the UK for this topic are "fragmentary" and may be dependent upon commercial or academic considerations yet the current statutory obligations of Defra for disease surveillance dictate a leadership role and much ownership of the agenda.

Given the national importance of diseases such as bovine tuberculosis, foot-and-mouth disease, bluetongue and avian influenza, Defra must also develop a stronger leadership role in the communication of science to a lay audience.

1. INTRODUCTION

The value to the UK of livestock production is estimated at around £8 billion arising from the annual production of around 10 million cattle, 35 million sheep, 6 million pigs and around 850 million chickens.

The impact of infectious diseases is considerable and directly accounts for a loss of around 20% of total production through a reduction of the value of livestock (poorer quality), less efficient rates of conversion of food to meat, less optimal weight gains, increased costs of production associated with use of vaccines and other medicines and poorer welfare. In addition, diseases such as bovine TB (bTB), bluetongue, avian influenza and foot-and-mouth disease (FMD) have impacts on the social fabric of the UK and, as illustrated graphically during the 2001 outbreak of FMD, the potential to restrict national and international trade in livestock and the rural economy more widely. Last but not least, some livestock diseases have the potential to establish in man (zoonotic pathogens).

In seeking to secure food supplies up to 2050, an important part of the UK national strategy must be to control infectious diseases of livestock.

Defra must continue to provide significant leadership of any multi-faceted strategy to control infectious diseases of livestock, backed by a consistent and realistic investment and be prepared to support longer-term research into key pathogens. They should continue to contribute to the provision of the necessary infrastructure, which includes trained scientists and technical staff, buildings and genetic resources of livestock, with the reasonable expectation that demand will increase for solutions to disease problems because:

- There will be a continuing need to protect animal health and welfare against new and variant pathogens.
- Infectious diseases will emerge and re-emerge with changing UK agriculture/ farming practices. For example, further demand for poultry reared less intensively will create opportunities for diseases that have been virtually eliminated by the husbandry practices associated with intensive production; for example diseases caused by worms.
- Infectious diseases will remain a global problem that is exacerbated by changes in climate, demography, globalisation, trade, animal movements, land use and diversity of livestock products.
- There will be increased threats to human health from zoonoses.

- There will be greater risks associated with bioterrorism to UK livestock and human health.
- There is already now a reduced availability globally of drug-treatment for food-producing animals.
- A rising global population, together with the factors above, increases further the need to protect UK food supply and food security.

If Defra do not show the appropriate leadership, there are no guarantees in place to ensure that other organisations in the UK have the capability to fund the breadth and depth of relevant scientific research needed to provide sustainable solutions for control of current livestock diseases, or to predict and prevent new incursions of disease. It is noteworthy that some viruses, e.g. African swine fever virus, now circulating within Eastern Europe are characterised by an ability to kill close to 100% of the animals they infect. Incursions of such pathogens (and BT virus killed 15 million sheep in Belgium in 2007) are now much more likely in the UK due to the factors bulleted above.

Defra investment will be necessary to help support a vision for the future production of disease-free livestock that contributes to ensuring the delivery of a pipeline of new and increasingly sophisticated control measures in collaboration and alignment with the best commercial companies. Defra and other funders, such as BBSRC, must continue to work closely together and, in turn, help create the best working environment for scientific collaborations with the commercial sector.

For control of disease in major livestock species, it is clear that vaccination is becoming the approach of choice. The poultry sector, especially, relies heavily on vaccines and given the importance of this sector to the UK Defra must have ongoing investment into poultry disease research so that the UK can best protect its breeding and egg-laying flocks from the many viral, bacterial and parasitic pathogens that they encounter.

## 2. A NEED FOR CONTINUED INVESTMENT BY DEFRA INTO DISEASES OF LIVESTOCK: SOME EXAMPLES

### *Poultry*

#### *A continued need for Defra to invest in relevant, longer-term research*

Chicken meat and eggs comprise a major part of the UK diet. Chicken is often the meat of choice and consumption in the UK is about 25 kilograms per head per year—exceeding that of any other meat and accounting for about one third of all meat consumed.

Chickens (broilers) reared commercially for their meat are housed in large numbers on the ground and at high stocking densities. The UK annually produces around 850 million broilers, 17 million turkeys, 19 million ducks, and around 100,000 geese. The degree of self-sufficiency in poultry meat in the UK has declined to about 89 per cent in the early 2000s from around 97 per cent in the late 1980s.

Vaccination against many pathogens is an integral part of the poultry industry and it is unlikely that poultry production on the current scale would be achievable if just one of the major diseases were to become uncontrollable. Many pathogens of poultry evolve with time, through the selection of genetic variants which can lead to dramatic changes in their virulence and pathogenicity; the sector has also had to deal with incursions of entirely new diseases on occasion. To illustrate that continuity of current poultry meat supplies cannot be taken for granted, reference can be made to Marek's disease, a highly contagious neoplastic disease caused by Marek's disease virus (MDV). This disease can cause devastating losses through high mortality and morbidity and the UK provides world-leading skills on this pathogen. The first ever vaccine against Marek's disease in poultry (in fact the first ever vaccine against a cancer-causing virus) was developed by UK scientists and the vaccine was a critical component in the transformation of the developing poultry industry. The current use of Marek's disease vaccines is colossal and the economic impact of control of Marek's disease by the principles and vaccine arising from UK research can be measured in £ billions. Unfortunately, every decade or so, markedly more aggressive forms of MDV evolve and there is an ongoing need to develop and introduce new vaccines otherwise poultry production and supplies of meat worldwide would be seriously compromised. Increasingly sophisticated solutions to new vaccine development are needed and the UK commercial sector has an absolute long-term commitment to invest in the use of each new generation of product. Currently much of the critical expertise needed to develop the new vaccines resides within Government-sponsored Institutes such as IAH and provides cutting edge research that complements the manufacturing capacity of the commercial sector for delivery of the next generation of vaccines.

A critical point about the example with Marek's diseases is that the relationship between the host (chicken) and the pathogen (Marek's disease virus) can be viewed as a classic "Arms Race" in which the continued evolution of the pathogen through natural genetic mutation enables the selection of viruses that

can overcome an intervention strategy such as vaccination. Thus, whilst vaccines may “win” for a period of time, a rapidly mutating pathogen that cycles rapidly through livestock reared under highly intensive conditions of husbandry has the potential to become the ultimate “victor”. History indicates that, in the case of Marek’s disease, perhaps five or more new control measures will be required by 2050.

### 3. CATTLE AND SHEEP PRODUCTION

*A continued need for Defra to invest in relevant, longer-term research and science communication*

The UK cattle population is about 10 million and the total value of cattle, pigs and sheep in the UK is about £8 billion per annum.

In view of the changing livestock diseases and patterns of disease experienced in the UK, increasingly as a result of climate change, Defra will again need to continue to support a range of scientific research activities with a preparedness to invest in the infrastructures necessary, be they facilities, scientific and technical experts or tools and reagents, to ensure that the UK is adequately equipped with the resources necessary to control, contain and eradicate diseases as necessary.

There is now the prospect that diseases currently given the status of “exotic” to the UK, such as bluetongue, will become established in the UK and a revision of their status may be warranted. The example of BT illustrates well the need for investments in potential disease scenarios because there may be no time for a “catch-up” of scientific activity in the event of a new entry of disease. Prior investments in BT virus research enabled the UK to be best prepared in 2008 and they provide a good lesson of the need for advance planning and an acceptance that the next disease threat may come from an hitherto unlikely source, e.g. Africa.

The dairy sector provides a good example of the opportunity that exists for Defra to help lead on the agendas of communicating scientific advice and improving the relationship between scientific experts and the lay public. It is probable that improvements to the quality of cattle products could be achieved through some relatively simple steps, but some culture changes will be needed in the farming sector and Defra are well placed to help lead.

- Ongoing changes in the UK dairy industry, which include reduction in herd numbers, increase in herd sizes, geographic concentration of dairy herds and small profit margins leading to rationalisation of husbandry, are likely to have an impact on the way animal diseases are spread within the dairy cow population and on the way diseases and their impact are viewed and dealt with by the industry.
- Establishing a greater farm-level biosecurity culture in the farming sector would improve control of the spread of endemic diseases and better prevent incursions of exotic diseases, but farmers and others within the dairy industry seem reluctant to pursue this approach.
- There is a need to understand more fully the reasons why farmers adopt or resist disease control mechanisms. A key factor in the adoption of disease control measures is the communication of scientific advice and the relationship between scientific experts and the lay public.
- New forms of engagement between expert and lay actors (e.g. participatory and deliberative experiments) may foster better uptake of science-based disease control measures by resolving conflicts between different perceptions of knowledge and best practice.
- A key requirement is, therefore, to understand how disease control advice is communicated to farmers and to identify the main conflicts between scientists, veterinarians and farmers in developing disease control solutions.
- Important examples of endemic disease with increasing prevalence in the UK dairy herd are Bovine Virus Diarrhoea (BVD) and bovine tuberculosis (bTB). Ninety percent of UK dairy herds now show evidence of infection with BVD, but convincing farmers to control BVD is a challenge because the virus does not cause overt clinical signs. However, BVD has a significant deleterious economic effect on cattle production causing infertility, abortion and poor calf health and profound immunosuppression for at least two weeks.
- The immunosuppression caused by BVD may have two outcomes in relation to bTB
  - some cases of bTB may not be revealed by testing; and
  - subclinical cases of bTB may be exacerbated by unhindered dissemination of tubercle and become clinical “open” cases allowing spread of infection to other cattle and humans.

- The presence of these two diseases in British cattle may, either singly or in combination, be affecting the viability of dairy farms, thus having a major impact on rural communities and on the dairy product and live animal value chains, thus affecting the wider economy. bTB is also a zoonosis and an increase of bTB in cattle is causing a risk of a corresponding rise in the number of human cases.
- In other countries, both within and outside the European Union, BVD and bTB have been eradicated, or there are on-going eradication programmes. By not following this example and eradicating these diseases, the UK is putting at risk the chance of regaining valuable export markets for British livestock, which were lost during the BSE epidemic.
- During the next four decades, Defra has an opportunity to work with others to eradicate some important disease and, in so doing, ensure that cattle production is optimised further.

Institute for Animal Health

January 2009

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### Memorandum submitted by the Research Councils UK (SFS 49)

#### SUMMARY

- This response from Research Councils UK focuses primarily on research and postgraduate training in the UK.
- The UK has a strong research base underpinning agriculture, aquaculture, fisheries and food, including major centres of expertise and facilities at Research Council institutes. Applied R&D and translation into practice are weaker and need to be strengthened.
- The UK can be expected to contribute through its scientific expertise to meeting future challenges of increasing global food production and managing supply while minimising environmental impact.
- Sustained funding for research will be crucial to enable the UK research base to deliver the necessary basic and applied research and to ensure its translation into practical application.
- Defra should play a leading role including appropriate contributions to research programmes and working effectively with the Research Councils to ensure sustainable UK capacity and capability in agricultural research and development.
- Some of the issues raised in this document are also being discussed by the members of the Living With Environmental Change partnership, of which the Research Councils, Defra and some of its agencies are members. The aim is to co-design and co-deliver research addressing food and water issues in the context of a rapidly changing environment.

#### INTRODUCTION

1. Research Councils UK<sup>128</sup> is a strategic partnership set up to enable the seven UK Research Councils to work together more effectively and enhance the overall impact and effectiveness of their research, training, innovation and public engagement activities.

2. The Research Councils welcome the opportunity to respond to this Inquiry. This evidence is submitted by RCUK on behalf of the following Councils:

Biotechnology and Biological Sciences Research Council (BBSRC)

Economic and Social Research Council (ESRC)

Engineering and Physical Sciences Research Council (EPSRC)

Natural Environment Research Council (NERC)

3. It represents their independent views, and includes contributions from relevant NERC-sponsored centres and units (Annex 1). It does not include or necessarily reflect the views of the Department for Innovation, Universities and Skills (the sponsoring government department for the Research Councils). In addition to this response, the BBSRC and several of its research institutes are submitting separate information to the Inquiry.

4. This response focuses mainly on research and training, in keeping with the Research Councils' mission and roles. Annex 2 provides summary information on relevant cross-council research programmes, and Annex 3 sets out some definitions.

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<sup>128</sup> Further details are available at [www.rcuk.ac.uk](http://www.rcuk.ac.uk)



## POINTS RAISED BY THE EFRA COMMITTEE

Q1. *How robust is the current UK food system? What are its main strengths and weaknesses?*

5. The UK is around 60% self-sufficient in food production<sup>129</sup> and could in principle be made more so, but even if greater self-sufficiency were achieved it would not provide total security of UK food supply. The UK would remain dependent on import of foods that could not be produced domestically, and (crucially) also dependent on imported fossil fuels required for food production and distribution. Future policies may require changes in farming practice away from oil dependency, possibly at considerable cost to the consumer and productivity.

6. *Strengths*

- (a) The UK is well suited to some food production, with a moderate climate and fertile soils, generally with good water supply (see also Q2).
- (b) Highly productive and efficient, modern agriculture (although growth in UK productivity since the mid-1980s fell behind than in some other European countries, and this has been associated with reduced public spending on agricultural R&D<sup>130</sup>).
- (c) Excellent research base in basic/strategic biological (including biotechnology) and environmental science underpinning agriculture, fisheries and food. Major facilities and centres of expertise at Research Council institutes (Annex 1) are key parts of the national capability. (But see *weaknesses* regarding erosion of parts of the research base and the need for improved translation of basic research into practice.)
- (d) Expertise in modelling of climate, the climate-water cycle and agricultural productivity. Research capacity to tackle complex multi-sectoral issues that impinge upon food security.
- (e) Long term, spatially extensive, national datasets (soils, water, biodiversity) exist—required to monitor and assess the vulnerability of UK and internationally sourced food supplies.

7. *Weaknesses*

- (a) Lack of coordination across the many players in a varied and fragmented industrial sector where there is a need to provide a systems perspective of the rural economy.
- (b) A lack of integrated analysis of food-related policy objectives to include environmental and socio-economic aspects e.g. advice from the FSA on health benefits of increasing fish consumption is in conflict with current pressures on wild stocks and problems in the fisheries supply chain.
- (c) Limited coordination across government for collaboration between UK researchers and those overseas, especially outside the EU.
- (d) Many factors have contributed to changes in the emphasis given to food research, including decline in Defra's funding of research related to agriculture, food and fisheries over many years, with negative impacts on the research base and infrastructure including Research Council institutes. Agriculture and food research and training in the universities have also declined, with closure of some departments, facilities and courses and loss of associated expertise.
- (e) Shortages of key skills, leading to recruitment and succession problems in topics such as agronomy, weed science, plant pathology and mycology, plant breeding, soil science, animal disease research and whole animal physiology, agri-environment and areas of ecology and hydrology, numerical modelling and social policy.
- (f) Translation of underpinning research into practice needs to be informed by integrated insights from social science and made more effective. Applied agricultural R&D has declined; extension services for demonstration and advice also appear to be less effective than previously. Translation from basic and strategic research through more applied work and into practical application by industry needs to be strengthened.
- (g) Dependence of food production and supply chains on inputs such as energy and fertilisers puts them potentially at risk from rising energy prices and disruptions (as shown, for example, during industrial disputes that disrupted petrol supplies in 2000 and 2008).
- (h) Fisheries are at risk from overfishing and from discarding catches, poor implementation of scientific advice and enforcement measures, and potentially climate change and ocean acidification. Fish farming (but not shellfish or seaweed farming) is in turn largely dependent on wild capture fisheries and can itself have detrimental environmental impacts.
- (i) Agri-environmental practices can be too narrow, lacking adequately holistic frameworks and therefore undermining their long-term sustainability.

<sup>129</sup> *Ensuring the UK's Food Security in a Changing World* (Defra, 2008), para 4.12  
<http://www.defra.gov.uk/foodrin/foodstrategy/security.htm>

<sup>130</sup> *The need for a new vision for UK agricultural research and development* (Commercial Farmers Group, 2008); summary at  
[http://www.arthurrankcentre.org.uk/projects/rusource\\_briefings/rus08/644.pdf](http://www.arthurrankcentre.org.uk/projects/rusource_briefings/rus08/644.pdf)

- (j) Improvements are required in the extent and availability of spatial datasets (e.g. soils) that are essential to both long-term monitoring, planning and assessment, and short-term management. The UK also needs to improve its capacity to anticipate, model and appropriately respond to invasive species, ranging from viruses to larger vertebrates, that can threaten food supplies.

*Q2. How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

8. The UK is well suited to produce some foods, given its moderate climate and rainfall and fertile soils. With changing climate, northern Europe is projected to become more important in global food production. The climate of south-east England is projected to resemble the current climate in the Mediterranean, hastening the growth of new agri-industries (e.g. wine growing), while making some existing crops uneconomic—especially in areas that are already water stressed.

9. Global fisheries yields from marine capture appear close to their sustainable limits. Rebuilding of depleted stocks and further diversification of the industry may lead to some small increases in production. Increases in aquaculture production may be possible but are limited in the UK by the tendency to farm carnivorous species (e.g. salmon, trout) which in turn require substantial inputs of animal protein. Increased farming of shellfish and macro-algae has much greater potential.

10. Arguably among the greatest contributions the UK can make is in applying its scientific expertise to the global challenges. Greatly increased production using the same or less land and resources will be achievable only through integrated research and its effective application. For example, in many areas supply of freshwater may limit agricultural production on land, so marine farming lower in the food chain is an obvious area for expansion. UK research played a major part in the “green revolution” of the 1960s. The UK retains a strong research base in underpinning science<sup>131</sup> and can be expected to make similar significant scientific contributions towards increased production, both in the UK and internationally. As leading centres, the Research Council institutes will be crucial in the UK effort. But major sustained investment in high quality research will be required over the coming years to deliver the required improvements (see also Q3, science base).

*Q3. In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

#### *Soil quality*

11. Sustainable agricultural production depends critically on maintaining soil quality (soil fertility requiring suitable chemical and microbiological composition and physical structure). Basic and applied research (including soil mapping) will be needed to advance understanding of soil biogeochemical processes and to develop improved agricultural practices that conserve soil quality, control erosion and run-off, reduce compaction and enable reduced inputs.

#### *Water availability*

12. Climate change will impact on land use and lead to changes in rainfall, evapotranspiration and, crucially for groundwater resources, natural replenishment of aquifers. Increased demand for irrigation water can be expected in the dryer south-east of the UK. The UK will need to follow other regions of the world and speed up the use of unconventional water resources (saline and brackish, waste waters from sewage and industry, etc) in agriculture, and develop technical and policy solutions to reduce consumption.

13. In addition to changes in average rainfall, increasing variability and increasing frequency of extremes will affect agricultural productivity and food security. Our understanding of, and hence ability to model and predict natural variability is quite poor. A repeat of the prolonged dry period in the late 19th century would severely test the UK’s food (and water) security.

14. The global food production targets for 2050 will need to be met without increasing demands upon already unsustainably exploited water resources. While the green revolution doubled food production from many key food crops, this was accompanied by a trebling of water consumption.

#### *The marine environment*

15. Defra’s core aim is for safe and productive seas which can sustain fisheries and other human activities whilst also supporting a rich and diverse wildlife via an ecosystem-based approach to marine management. Challenges include balancing competing pressures (e.g. fisheries, marine renewable energy and nature

<sup>131</sup> For example, the UK is ranked top among G8 countries for citation impact of papers in biological sciences (DIUS statistics, Jul 2008): table and chart 1.10.03 at <http://www.dius.gov.uk/publications/IntComparativePerformanceUKResearch.pdf>

conservation), spatial planning and implementing Marine Protected Areas. Monitoring and research will be needed to support the ecosystem approach and to develop planning tools that support multiple, synergistic uses of the marine environment including food provision.

16. It is widely accepted that the Common Fisheries Policy has been a failure within the UK in terms of delivering its objectives of supporting economic, social and biological sustainability. There has been insufficient emphasis upon conserving the biological resource and the consequence has been degradation of the economic and social objectives. A challenge is to reduce the volume of capture fisheries within UK, EU and global waters and its collateral damage to ecosystems and local economies, without reducing profitability while competing in a global market.

17. Food production from marine ecosystems is under combined pressure from climate and fisheries. Pollution issues include wastes from and disease in fish farms, and impacts on migratory species and from terrestrial run-off. Changes in ocean temperature, storminess and acidity can be expected to affect productivity. Many species that are currently fished will decline; in particular cold water species (e.g. cod) will become less abundant in EU waters. Warmer water species (e.g. mackerel, sea bass) may compensate to some extent.

18. The projected loss of the Arctic ice sheet in summer months may lead to a local increase in fish numbers, mainly benefitting nations around the Arctic Ocean but contributing to the global supply of protein.

19. Aquaculture will outstrip fisheries as the major producer of marine food within the next decade, representing a paradigm shift in exploitation of the aquatic environment. As freshwater resources are already over-committed in many areas, this increased production will come from the sea. This represents a major challenge to sustainable management of the marine environment. Research investment in this area is required.

20. Wild fish supplies from warmer latitudes are likely to reduce as a consequence of climate change, but especially through over-fishing. Fish farming in Asia and Africa is likely to increase.

21. Fresh waters also support diverse fisheries and aquaculture operations. Research is needed into links between freshwater quality and habitat quality within the framework of integrated water catchment management planning.

#### *The science base*

22. The UK has a strong research base relevant to food production. But in order to meet future challenges it will be essential to sustain sufficient investment to provide appropriate capability, skills, infrastructure and facilities and enable the necessary research and its transfer into practice in the UK and overseas. Sustained funding is needed to support basic underpinning science, feeding into strategic, applied and policy research, and coupled with knowledge transfer through to practical applications for end users by mechanisms including effective extension and advisory services.

23. Research will need to become more interdisciplinary to address complex questions relating to food security, especially in the context of climate, environmental and social change. Systems approaches and research at a range of scales from molecular to field, catchment and regional will be needed. Integration of biological, environmental and socio-economic research will be essential, and the Research Councils will continue to promote and support interdisciplinary approaches wherever appropriate (see also Annex 2).

24. In relation to fisheries and aquaculture, improved co-ordination and links between the government-funded laboratories (FRS, CEFAS and AFBI) and the NERC capacity (marine laboratories and research ships) could maximise benefits.

#### *The provision of training*

25. A continued supply of skilled natural and social scientists will be essential to meet future challenges, both to sustain the research base and for the benefit of the economy more widely. The Research Councils play a central role in provision of training, particularly at postgraduate level. The Research Council institutes are an important component, hosting significant numbers of research students in relevant topics in underpinning biological and environmental sciences.

26. There appears to have been a shift in recent years in student numbers away from biology (and especially agriculturally relevant courses) towards biomedical topics. Skills shortages (see also Weaknesses) tend to be complex issues, with problems potentially arising in both supply (e.g. declining numbers of students) and demand (availability of relevant jobs). Incentives need to be improved to take up training and careers in more applied topics.

*Trade barriers*

27. The UK is a trading country with an open economy. A secure food supply does not, therefore, solely depend on the UK's potential for domestic production; this must be balanced with importation. Many national governments, however, responded to food price increases by adopting protectionist policies. Research shows this only serves to exacerbate price spikes and food security issues, cutting off trading flows at a time when they are most important. Food market regulation and socio-economic research can help inform both national and international practice and policy. This must be pursued, however, with a view to ensuring fair prices for both consumers and producers around the world; in this way the facilitation of an open global market in the food industry can be balanced by a commitment to tackle global poverty through the economics of food production and trade. Moreover, given the UK agricultural industry's dependence on energy inputs sourced from elsewhere, it is vital that efforts for international trade liberalisation also extend to these industries.

28. Other important issues to take into account are debt, distribution of wealth amongst producers and consumers within the UK, and local engagement in policy development, to enable bottom-up approaches with an understanding of cultural and social drivers. The impact of trade on the sustainable use of water resources globally is also important.

*The way in which land is farmed and managed*

29. To meet the increase in global food demand, the availability of agricultural land may need to increase, but land for food production will continue to face competition from encroaching urban development. A major challenge will be achieving a balance of productive agriculture (for food, fuel and raw materials) while also providing other ecosystem services (such as water, biodiversity, recreational use of the countryside) and in the context of climate and other environmental change. Severe water shortages, sea level change and the need to reduce inefficient fertiliser and pesticide usage are further challenges. In the interests of global food security it is paramount that agricultural productivity reaches its high untapped potential in the developing world and that efforts to reduce international poverty are more successful.

30. Research will be needed to support agricultural systems that manage land for a variety of purposes, and to predict, manage and mitigate possible consequences such as soil degradation, depletion/replenishment of groundwater resources and impacts on biodiversity in agricultural and associated habitats.

31. Further research is needed into the effect of farm size upon agricultural productivity. Small household farming units can help maintain food supply and underpin local rural economies. But larger production units (such as in Brazil) can often improve agricultural productivity.

*Q4. What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

32. The *Food Matters* report reviewed the main trends in consumption. An increasing proportion of consumers are likely to want foods offering health benefits and some will be prepared to pay a premium for this. There will be increasing demand for foods that are perceived to have low environmental impact or not to degrade quality of life in developing countries. Convenience foods are associated with increased energy input and wastage and this may become increasingly unacceptable to consumers and to industry, particularly as 30–50% of production is lost to food chain wastage. However, cost will remain a prime concern for the majority of consumers.

33. Consumers will want to be increasingly reassured of the provenance of foods and traceability will become more important. Local food networks may become more important but are unlikely to provide more than a minority of sales and will not address issues such as diversity, convenience and cost. Locally sourced foods may be attractive but must be priced right and available through existing sales infrastructures.

34. A drive to greater national self-sufficiency would lead to increased seasonality and a much narrower choice of foods that would require considerable changes in attitude for acceptability. However, benefits to health, the environment and industry make attempting to change consumer attitudes worthy of perseverance.

35. Other issues that must be considered in relation to consumer behaviour include demographic changes (i.e. different ages have different tastes and desire different foods) and current concerns over obesity and health in relation to dietary trends.

*Q5. What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

36. In our view Defra (acting with its devolved counterparts) should take a leading role, in its capacity as the government department with responsibility for farming and food. The department's focus in recent years has tended more towards environmental issues than to food production *per se*. The Foods Standards

Agency (and FSAS) has shown a strong lead in relation to food safety and nutrition; similarly the Environment Agency (and SEPA) has a clear role in environmental protection and regulation. The position for food production and supply is less clear.

37. The Research Councils have little direct experience of Defra's interactions with the food industry. However, it is a matter of record<sup>132</sup> that in the area of animal health the department is exploring cost sharing with the farming industry. The philosophy seems to be that of "industry pays for the research that it wants". While this may be appropriate for some activities, the industry is likely to be unable or unwilling to contribute on the scale envisaged. Government needs to step in and show leadership where it is necessary to address market failures.

Q6. *How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

38. We address these questions under separate sub-headings of engagement across government and cross-government food strategy.

#### *Engagement across government*

39. We are in a position to comment only on direct interactions of the Research Councils with Defra. The department engages appropriately through UK advisory and coordinating bodies on various food-related research topics (e.g. microbiological food safety). Defra leads for the UK in various international fora and engages well with the Research Councils (e.g. in developing the EU Framework Programmes; the European Commission's Standing Committee on Agriculture Research (SCAR); tetrapartite meetings on agri-food research with France, USA and Canada).

40. Defra's engagement with Research Council programmes and support for research through its policy-linked work is welcomed. Defra has been a significant player in the design of LWEC (see Annex 2) which has a specific objective on food and water. However, declining Defra funding of BBSRC institutes with a direct relevance to food production and diet and health has been problematic. A particular issue has been the department's reluctance to acknowledge its role in contributing to the sustainability of the research base and infrastructure, contrary to RIPSS<sup>133</sup> principles. The House of Commons Science and Technology Committee reviewed these funding issues in its report on Research Council institutes (March 2007) and recommended that Defra should implement RIPSS. This remains outstanding.

#### *Cross-government food strategy*

41. To date there has not been a coherent cross-government food strategy but recent coordinating activity following the *Food Matters* report gives cause for optimism that a strategy is being developed. We strongly welcome the interest and leadership shown by the Government's Chief Scientific Adviser.

42. We further welcome the establishment by Defra of the Council of Food Policy Advisors, although in our view it would be strengthened if its membership included additional scientific expertise. The recent growing interest across government in food policy is welcome and creates considerable opportunity to improve the governance of the UK food system with enhanced policy engagement including in relation to the EU and World Trade Organisation.

Q7. *What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

43. Defra should continue to publish statistics on UK agricultural and fisheries production, and related environmental measurements such as water use and quality. In liaison with DfID and relevant international bodies such as FAO, similar measurements of global food production and the environmental impacts of agriculture, fisheries and aquaculture should be monitored. Data and associated metadata should be made fully available in a timely manner, to assist researchers.

44. The Defra report recognises the need to better quantify the greenhouse gas emissions associated with food production and supply. As methods develop it will be necessary to monitor such emissions.

45. In exploiting the UK's leadership in global climate-water modelling, Defra/DfID/FCO in conjunction with the Research Councils should support improved modelling of global and regional climate-water-food-population relationships. This could be done under the auspices of existing partnerships such as UKCDS and LWEC (Annex 1).

<sup>132</sup> Defra cost sharing proposals (2007-08): <http://www.defra.gov.uk/animalh/ahws/sharing/index.htm>

<sup>133</sup> RIPSS: *Research Council Institute and PSRE Sustainability Study* (DTI, 2004)

<http://www.berr.gov.uk/dius/science/science-funding/ripss/page22675.html> and <http://www.berr.gov.uk/files/file14578.pdf>

46. The department should monitor its research spending in relation to food production, alongside that by the Research Councils in the UK and also government counterparts overseas. Full details of all the department's research investment and strategy should be readily available.

## Annex 1

### RESEARCH COUNCIL CENTRES AND INSTITUTES RELEVANT TO FOOD SECURITY

#### *BBSRC institutes*

[www.bbsrc.ac.uk/organisation/institutes/sponsored\\_institutes.html](http://www.bbsrc.ac.uk/organisation/institutes/sponsored_institutes.html)

The BBSRC institutes conduct long-term, mission-oriented research using specialist facilities, some of which are unique in the UK or internationally (such as animal disease containment facilities, long-term field experiments). They maintain strong interactions with industry, government departments and other end-users of their research to provide advice and promote knowledge transfer, and are leading partners in numerous overseas collaborations.

Institute for Animal Health (Compton and Pirbright)—combating livestock diseases.

Institute of Food Research (Norwich)—food structure, quality and safety, diet & health.

John Innes Centre (Norwich)—plant and microbial science underpinning crop production.

Rothamsted Research (Harpenden) and North Wyke Research (Devon)—arable and grassland agricultural systems, including long-term field experiments (some continuous since 1843).

#### *NERC Research and Collaborative Centres*

[www.nerc.ac.uk](http://www.nerc.ac.uk)

British Geological Survey (BGS)—the world's longest-established national geological survey and the UK's premier centre for earth science information and expertise. Research covers soils and groundwater.

Centre for Ecology & Hydrology (CEH)—climate-water, water resources, droughts, floods, water quality, ecology, agri-environment, irrigation, soils, genetically modified organisms, land use, biodiversity, invasive species, energy crops.

Proudman Oceanographic Laboratory (POL)—oceanographic research including ecosystem modelling.

Plymouth Marine Laboratory (PML)—research on environmental issues in marine science including sustainable marine ecosystems, environment and health (which encompasses the sustainable management of the oceans).

National Oceanography Centre, Southampton (NOCS)—research, teaching and technology development in ocean and earth science.

Scottish Association of Marine Science (SAMS)—research and modelling underpinning a) the sustainable use of the marine environment for aquaculture; b) the quality and safety to humans of marine shellfish and c) novel food products from marine organisms.

Sea Mammal Research Unit (SMRU)—interdisciplinary research into the biology of marine mammals, including fisheries interactions.

## Annex 2

### SOME CROSS-RESEARCH COUNCIL PROGRAMMES AND PARTNERSHIPS RELATED TO FOOD SECURITY

Ecosystems Services for Poverty Alleviation (ESPA)—NERC, ESRC and the Department for International Development (DfID) join forces to explore the potential for a multi-disciplinary research programme that will address how to achieve sustainably managed ecosystems.

Living with Environmental Change (LWEC)—a ten-year programme, to provide decision makers with the best information to effectively manage and protect vital ecosystem services. Partners include all the Research Councils together with departments of state, devolved governments and agencies, business and other stakeholders.

The Research Councils' Energy Programme has funded the Food Climate Research Network (University of Surrey) to provide a focus for research and policy on food and climate issues in the UK.

Rural Economy and Land Use (RELU)—an interdisciplinary programme focusing on understanding the social, economic, environmental and technological challenges that rural areas face. RELU is funded by ESRC, NERC, and BBSRC with additional support from the Scottish Government and Defra.

Global uncertainties; security for all in a changing world—all Research Councils will work together to address four inter-related global threats to security—crime, terrorism, environmental stress, and global poverty, each linked in a systematic way to address three themes—causes, detection, and possible interventions to prevent harm. ([www.rcuk.ac.uk/research/ccprog/security.htm](http://www.rcuk.ac.uk/research/ccprog/security.htm)).

UK Collaborative on Development Sciences (UKCDS)—a forum bringing together relevant UK government departments and research organisations to improve coordination of research in support of international development. Current and recent activities include studies on climate change and food security.

Sustainable Marine Bioresources (joint between NERC, Defra, Scottish Government and AFBI).

### Annex 3

#### DEFINITIONS AND SCOPE

We take the scope of the “UK food system” to cover the supply of safe and nutritious food to the UK. It includes primary agricultural production (crops and farmed animals), freshwater and marine fisheries and aquaculture in the UK. In addition it is essential to consider the wider context including: global food production and international trade; storage, distribution and transport; food processing, manufacture, preservation and wastage; food safety throughout the supply chain; and the interactions of diet and health. In addition, energy, water and other inputs (for production and supply chains) must be taken into account.

Food security must be understood as a multi-faceted concept that operates at household, local, national and international levels. It is defined differently under different jurisdictions and as such is highly complex. While new food production methods and systems are an important element of food security, issues of price, access, nutrition and environmental impact are also important. Above and beyond all of these concerns lie policy issues at all levels as well as questions of responsibility and ethics.

We take “food production” to cover production of crops (for food and farm animal feed) and animals (farm animals, aquaculture and fisheries), including management of agricultural land and soils, and dealing with pests and diseases of crops and livestock. Production of non-food crops (for fuel or industrial raw materials such as fibre) may also need to be considered, for example to address competition for land and other resources.

January 2009

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### Memorandum submitted by the Biotechnology and Biological Sciences Research Council (BBSRC) (SFS 50)

#### SUMMARY AND MAIN MESSAGES

- BBSRC is the UK’s leading public funder of research underpinning agriculture and food supply, and plays a key role in supporting relevant science through universities and the BBSRC research institutes.
- Climate and other environmental change are important factors but food security must also be considered more widely.
- BBSRC research institutes are a key resource and national asset, central to the UK’s capability to respond to the challenges ahead.
- Improvements are needed in the translation of underpinning science into practical applications: Defra and the Technology Strategy Board must play a leading role in partnership with BBSRC.
- Substantial and sustained new funding for research and training from the public (research councils, government departments) and private sectors will be essential to deliver basic and applied research and to ensure its translation into practice.
- There is a need for better coordination across research funders, including more leadership from Defra as the responsible government department.

#### INTRODUCTION

1. The Biotechnology and Biological Sciences Research Council (BBSRC<sup>134</sup>) is the UK’s leading public funder of research and postgraduate training in the non-medical biosciences, including agriculture, food, and diet and health. Embedded within our strong ethos of excellence in research we actively promote knowledge transfer from basic research to applications in industry, policy and public services, and foster public engagement across the biosciences.

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<sup>134</sup> BBSRC, a non-departmental public body, is one of seven Research Councils supported through the Department for Innovation, Universities and Skills (DIUS). BBSRC works with partner Research Councils through RCUK. Further details are available at [www.bbsrc.ac.uk](http://www.bbsrc.ac.uk)

2. This response should be read in conjunction with the submission from Research Councils UK, to which BBSRC contributed and which addresses each of the questions posed by the EFRA Committee. In addition, four BBSRC research institutes have submitted separate evidence that each provide more detailed scientific perspectives, in particular on animal diseases (Institute for Animal Health), crop production (John Innes Centre and Rothamsted Research) and food safety and nutrition (Institute of Food Research).

### *The challenge of food security*

3. We strongly welcome this inquiry by the EFRA Committee. Future food security for the UK and globally is a crucially important and wide-ranging issue that requires coordinated approaches across government, industry and other stakeholders. Research and skilled people will be essential to meet the significant challenges ahead.

4. Food security is not simply about climate and environmental change. If we had no climate change then, as the Government's Chief Scientific Adviser has made clear, mankind would still be faced with a significant food security challenge—for example through global population growth, changing demographics and competition for land. But factors such as climate change exacerbate the problem through additional threats to food production.

5. While crop production and the security of grain supplies have received much attention, we emphasise that food production and security (and the underlying research needs) must be considered more widely. Crop production depends on sustainable management of agricultural land and soils. Also centrally important is the production of animals for food (including farm animals, aquaculture and fisheries). The understanding, prediction and control of pests and diseases of livestock and crops are further vital topics, particularly in the context of climate change that is likely to lead to changes in the distribution of disease-causing organisms and/or their vectors (insects, etc) (see BBSRC institutes, below).

6. Food security drivers and associated research needs need to be considered at UK, European and global levels, while recognising that all are inter-related. Furthermore, the security of food supplies must be considered in the broader context of global production and international trade; storage, distribution and transport; food processing, manufacture, preservation and reducing waste. Food safety must be maintained throughout the supply chain. The relation between diet and health must be better understood as part of the context of providing increased supplies of nutritious food.

7. A further aspect of the broader context is that food security depends on energy, water and other inputs such as fertilisers and pesticides—directly for food production and also as fuel etc needed for food processing and supply chains.

### ROLE OF BBSRC

8. BBSRC, as the principal public funder of research related to food production and security, supports fundamental, strategic and applied research and postgraduate training that underpins agriculture and food supply. This continues a long history in the UK of high quality research related to agriculture and food, funded largely by BBSRC and its predecessors.

9. BBSRC total spend in this area was around £185 million in 2007–08. This included research on: plant and crop science (including the control of pests and diseases); soil science; aquaculture; animal health; animal welfare; food safety; food manufacturing; diet and health; agricultural systems and the effects of environmental change on those systems.

10. BBSRC supports research in UK universities and in the Council's sponsored institutes. Research ranges from basic underpinning biology aimed at fundamental understanding of how plants, animals, microbes and biological systems function (at molecular, cell, organism and population levels), to more strategic and applied research (including work in collaboration with industry) focused on important questions of direct relevance to food production and supply.

11. BBSRC works to support international partnerships and research collaborations around the world, including links with countries of growing economic importance such as China and Brazil. We are also pleased to work closely with DfID and have recently put in place two major research initiatives co-funded with the department, both directly relevant to food security in developing countries.

12. Examples of BBSRC-funded and other research (relating particularly to crop production and underpinning plant science) can be found in the recent BBSRC publication *Bioscience behind secure harvests*.<sup>135</sup>

<sup>135</sup> *Bioscience behind secure harvests* (BBSRC, 2009)

[http://www.bbsrc.ac.uk/publications/corporate/bioscience\\_behind\\_secure\\_harvests.html](http://www.bbsrc.ac.uk/publications/corporate/bioscience_behind_secure_harvests.html)



## BBSRC INSTITUTES

13. The BBSRC sponsored research institutes form a core component of the UK's national capability in research and training relevant to agriculture and food security. They provide critical mass of scientific expertise together with essential facilities, infrastructure and resources for research. They are also a vital source of independent advice to Government.

14. The BBSRC institutes related to food security are:

- Institute for Animal Health (Compton and Pirbright)—combating livestock diseases [www.iah.bbsrc.ac.uk](http://www.iah.bbsrc.ac.uk).
- Institute of Food Research (Norwich)—food structure, quality and safety, diet & health [www.ifr.ac.uk](http://www.ifr.ac.uk).
- John Innes Centre (Norwich)—plant and microbial science underpinning crop production [www.jic.ac.uk](http://www.jic.ac.uk).
- Rothamsted Research (Harpenden) and North Wyke Research (Devon)—arable and grassland agricultural systems [www.rothamsted.ac.uk](http://www.rothamsted.ac.uk).

15. In addition, BBSRC continues to provide significant funding for research relevant to agriculture at two former institutes that have recently transferred from BBSRC to universities: the Roslin Institute (Edinburgh—farm animal science, [www.roslin.ac.uk](http://www.roslin.ac.uk)), and the Institute of Biological, Environmental and Rural Sciences (IBERS, Aberystwyth—grassland and associated livestock science, [www.directoribers.co.uk](http://www.directoribers.co.uk)).

16. Particular strengths of the BBSRC institutes include the ability to conduct long-term, mission-oriented research using specialist facilities, some of which are unique in the UK or internationally (such as animal disease containment facilities and long-term field experiments). The institutes maintain strong interactions with industry, government departments and other end-users of their research to provide advice and promote knowledge transfer, and are leading partners in numerous overseas collaborations. They are active in public engagement, and also contribute significantly to training future generations of scientists: the institutes host numerous postgraduate research students, building on the many links between the institutes and leading UK universities.

17. Most of the UK's capacity to work on pathogens of livestock and crops rests in BBSRC sponsored institutes. This is particularly the case with animal disease where the Institute for Animal Health (IAH) is a major international centre of excellence. An example of the crucial role of the institute's research is that of the recent occurrence of bluetongue virus (BTV) in the UK. Bluetongue is a significant disease of ruminants such as sheep and cattle which is carried by biting midge vectors. Scientists at IAH have monitored the progression of the disease and its vector from northern Africa through the Mediterranean to northern Europe. In 2007 they were able to predict, based on temperature and weather patterns, the first occurrence of the disease in eastern England. This significantly increased the UK's preparedness for the disease and a vaccination campaign (again based on IAH research) in 2008 prevented significant recurrence. IAH remains at the forefront of the battle against BTV as further different types of the virus now threaten the UK. An independent report by consultants DTZ<sup>136</sup> estimated that the institute's work on BTV has potentially saved the UK economy £485 million and 10,000 jobs. Further details of the science behind bluetongue and the role of IAH can be found on the Institute's website.<sup>137</sup>

*Future funding and coordination*

18. Food security is a broad and complex area: food production and supply must be set in the wider context that includes environmental and socio-economic considerations. The *Food Matters* report is a welcome analysis, and the submission from RCUK sets out some of these complexities from a research perspective. Research on many topics will be central to meeting the challenges of future food demands.

19. Substantial and sustained new investment in research and development will be needed over the coming years and decades. Food security will be a priority for BBSRC research funding, but coordinated investment from other partners across government and industry will also be essential.

20. Defra is clearly an important player and the department should take more of a lead across government and in partnership with others. The submission from RCUK draws attention to the long-standing difficulties in interactions with Defra over funding for Research Council institutes, and in particular Defra's failure to implement RIPPS<sup>138</sup> and acknowledge its role in contributing to the sustainability of the research base and infrastructure. The department's focus on short-term funding has not been conducive to planning what are intrinsically longer-term research programmes. Overall, Defra's support for research in agriculture and food has declined considerably over many years. Funding cuts have had significant impact, notably at BBSRC institutes and especially when imposed with little notice, and it has not been possible for the Research Councils or other funders to fill the gap.

<sup>136</sup> DTZ report: [www.iah.bbsrc.ac.uk/ecosoc/docs/Blue-Tongue-case-study.pdf](http://www.iah.bbsrc.ac.uk/ecosoc/docs/Blue-Tongue-case-study.pdf)

<sup>137</sup> Bluetongue information on IAH website: [www.iah.ac.uk/news/btnews.shtml](http://www.iah.ac.uk/news/btnews.shtml)

<sup>138</sup> RIPSS: *Research Council Institute and PSRE Sustainability Study* (DTI, 2004)

[www.berr.gov.uk/dius/science/science-funding/ripss/page22675.html](http://www.berr.gov.uk/dius/science/science-funding/ripss/page22675.html) and [www.berr.gov.uk/files/file14578.pdf](http://www.berr.gov.uk/files/file14578.pdf)

21. While Defra should take a lead in coordination across government and other stakeholders, BBSRC will have an important role as a major funder in this topic. We will continue to work closely with other funders including Defra to deliver the necessary research and help meet the future challenges.

*Translation into practice*

22. While the UK has major strengths in basic bioscience and other relevant disciplines, the translation of that underpinning knowledge into practice is less well developed and rather fragile. Key areas of concern where translation is problematic (all relevant to Defra and where the department should have a role) include: the improvement of crops and farm animals; addressing the health and welfare of farm animals; food safety throughout the supply chain; and issues around impact of EU legislation on UK farming practice. There are also important translational considerations in areas such as the support of collaborative research between academia and industry, enabling SMEs to engage in relevant research, and the promulgation of best practice throughout the farming sector.

23. Further emphasis, with suitable incentives and rewards for researchers, needs to be placed on strategic and applied research, and directed towards promoting practical application by industry.

24. BBSRC and its institutes have an important role to play in helping to deliver the full range of research, from basic to applied, and its translation into practice. But other funders must also contribute. It is to be hoped that plans to develop funding mechanisms in partnership with the Technology Strategy Board can be brought to fruition.

*Future directions—BBSRC food security meeting, February 2009*

25. BBSRC is currently developing a new strategic plan for the next five years, in which food security, and the relationship between diet and health, will feature prominently. To take forward its new strategy, the Council is holding a high-level meeting in February 2009 to draw together scientific thinking about food security, including input from the Government's Chief Scientific Adviser, Professor John Beddington. The purpose of the meeting is to develop a "roadmap" for coordinating scientific and user responses to the research challenges of food security—on timescales of 20 and 40 years—and to provide a framework for BBSRC's future investment in association with other Research Councils and government departments.

26. Skills shortages are a problem in a wide range of topics related to food security (the RCUK submission to this inquiry also refers). Recognising the fragile nature of the delivery pipeline, there will need to be an emphasis on the provision of appropriate skills, mechanisms and funding for strategic and applied research to translate the findings of the UK's excellent basic science in biology and other disciplines into practical applications by the farming and food industries.

*BBSRC*

*January 2009*

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**Memorandum submitted by Ms Joanna Wheatley (SFS 51)**

**INQUIRY INTO FOOD SECURITY TO 2050**

I am a beef farmer, and have owned and solely managed a beef herd since 1984 when I inherited my father's farm. My father had been unable to use many chemicals because they affected his breathing. I enjoyed the extra wildlife that afforded my acres so continued in the same vein. I also stopped buying in cattle and increased the herd solely by selecting the best female calves. This action effectively stopped me introducing infective diseases and parasites which enabled me to relax on routine worming and vaccination, none of the cows on my farm now, have ever been wormed or vaccinated, and are completely healthy and fertile. Apart from being more fertile they grow fitter and faster than neighbours do, and I only feed my own meadow hay in the winter.

When I left school I worked as a research scientists developing Organo Phosphate [OP] pesticides, so have had the benefit of experimental scientific training. This meant I questioned and rationalised rather than just followed the set trend, being raised on a farm I had good common sense, you cannot fake things in the real world, it's actual, life or death profit or loss, it's not an experiment that you throw away and write up.

I became aware of the cavalier attitude of most farmers to chemical usage through being chairwoman of the local branch NFU. Cavalier promotion, plus inadequately dangerous warnings on containers, even the spouts of canisters would run back on to overalls, this situation has improved but the general farmer is addicted to the chemical quick fix, trapped like a hamster in a wheel.

In this position and regional livestock representative plus my mother has a neurological disease [never before had a neurological disease been considered infectious] I took a keen interest in BSE. Culminating in attending and closely following the BSE Inquiry, I went supporting the overuse of OPs theory but had to

reconsider when I heard evidence about the use of injectable bovine based pharmaceuticals. With regard to BSE the specific use of growth and fertility hormones obtained from cadaveric pituitaries which have a history when injected directly into the same species of causing in humans CJD that became my greatest concern.

We are injecting cattle with the remains of other cattle, humans too, surely this is risky and should be acknowledged in risk assessments and monitored.

Furthermore what standards are these animals farmed to?

I consider the way I raise my cows to be the purest you could get and worthy of being a pharmaceuticals herd. As far as my MP, Adam Afriyie, and I can establish there is no such thing, even worse there seems to be no traceability as to where this material has been sourced. Whereas with food and feed the area is burgeoning with legislation leading to an unsustainable use of imported Soya and the like. The same expensive anomaly has arisen with pigs they all have to be fed expensive high protein cereals lest they become contaminated with Foot and Mouth [FMD]. In the rest of the world these restrictions do not apply. But these pigs could have got the disease through contaminated injectables; this situation is never checked.

Unless these loopholes are addressed we will continue to have uncontrollable outbreaks of diseases such as FMD, BSE, TB, to name only the most costly of transferable diseases by this route.

There is no legislation covering the collection of these valuable items at the abattoir although there are very expensive veterinary officials supposedly overseeing disease contamination. However with the best will in the world they cannot detect microscopic infection, this can only be achieved by routine microscopic testing of material, not by the vets who can be users of these materials, thus have an intellectually corrupt position.

Hygiene rules are completely different now to how they were thirty years ago, to the financial burden of livestock producers. It may even be to pharmaceutical standard, these materials are certainly leaving the abattoir, although the farmer receives no recompense or generally has any knowledge of such uses.

In order for the survival of livestock production in this country the above needs to be rectified.

Here is a list of the most important:

Open and accountable systems must be established so integrity can follow.

Pharmaceutical herds established with the farmer's knowledge and acceptance for which he should receive recognition and payment.

The animals are transported to a designated abattoir that needs to have all the extra measure suitable for this trade. The extra measures required for pharmaceutical standards should be borne by the recipients of the materials.

An audit trail should be established from the abattoir to the end use, including research materials, being logged along the way. So if contamination should happen it can be traced right back through the chain.

Absolutely no animals used in research of any kind should enter an abattoir, thus eliminating the ability to recycle and spread disease. These animals should be dealt with on site.

With regard to chicken production I am on less sure ground, but I do know for a fact that vaccines are grown in fertile eggs. I also know that salmonella and new strains of E coli which can give a very unpleasant tummy upset if ingested, a situation which animals have been coping with since the beginning of time, it can be expelled rapidly from the digestive tract. Not so if injected, there is no rapid expulsion method, hence the infection will be very serious.

Again are the producers aware that this is the trade that they are supplying?

If they are supplying this trade, they also should ease back on chemical use. Specifically OPs which may not only be in high residue in the grain they eat but also used as a douse for parasite control and their houses fumigated for 24 hours air control for flies etc. giving continuous dosing to the chicken that may provoke first signs of poisoning, flu-like symptoms. [As identified in Health and Safety Executive [HSE] Medical Statement [MS] No 17.]

Could this be the route of Bird Flu?

I also know the OP grain treatment Pirimiphos Methyl can mutate E coli, thus forming new strains. A nightmare scenario for the farmer, all animals have E coli benignly living in their guts, surely if OP treated food is ingested then new strains are bound to occur.

The same affliction may be catastrophically affecting dairy herds, who have to be fed cereals because of the BSE regulations before mentioned.

The move towards Genetically Modified pharmaceutical replacements should not be hasty as these also usually have an animal base, which has been cloned. Still presenting the opportunity to create immune system rejection effects, which are bound to happen when injecting tissue within species, and unless you are going to administer anti-rejection drugs for the rest of the animal's life, which in itself would be unacceptable for food animals.

With direct respect to the questioned posed at 2.

Unless the above anomalies are addressed and corrected, meat and milk production of the UK will continue to become increasingly unsustainable and we will be increasingly reliant on imports, the quality and consistency of which we are less able to control. The turnover in cattle is increasing most dairy cows are burnt out by the age of eight whereas cows used to last for routinely more than a decade. Chicken and pig finishing ages have shortened to keep prices competitive but that cannot continue. Both of these situations occur to the detriment of animal welfare, contented well-looked after will always “do” better.

*Soil quality* will become increasingly less fertile unless the natural cycles of flora and fauna are protected and reintroduced where possible. E.g. applying of nitrates negates the need for naturally occurring humus. Chemicals inadvertently also kills more than the target, i.e. weedkillers also kill beneficial plants like clover, a natural way to return nitrogen back to the earth. Fungicides also kill natural mycelium in the soil, some of these assist root hairs in their uptake of nutrients.

Livestock reinvigorate the soil; the preservation of the ability of a rotation to include livestock should be protected and promoted.

1. *Water availability*, a humus rich fertile soil will hold a lot more water than one stripped of life.
2. *Marine environment* will also suffer from loss of livestock, as run off will be greater through lack of natural binding.
3. *The science base* needs to be reality based, alongside all the interconnectivity of real life not in the laboratory under controlled conditions that cannot be replicated in the outer environment. Nor is there any sustainability than scientists thinking farmers can be “clean”. Soil is not “dirt” and it can and always has got everywhere, without causing too many problems.

No treatments should be compulsory for the whole country, if you treat everything, you lose your inherent reference point.

Risk analysis should always be unbiased, never just one professional bodies’ pet theory.

Vets should not be considered independent “experts”, the same should be said of any professional body.

Farmers should have routine independent health checks. Plus the same organisation which sells or licenses a product should never be associated with investigating an adverse reaction claim. They are the “canaries down the mine” when it comes to the effects of chemicals, front line users, therefore should be monitored. Cancers, diabetes and mental health conditions to name but a few listed in HSE Guidance note MS 17 and in Organophosphates and Health. Editors Lakshman Karalliedde, Stanley Feldman, John Henry, Timothy Marrs. Published by Imperial College Press ISBN 1860942709. This book should be widely distributed to GPs and hospitals.

A more holistic view should be taken of science generally, never forgetting the natural and immensely intricate symbiosis that has taken millennia to develop.

4. *Provisions of training* should also be based in practical learning in farm situations, with more bias on observation, which should override the textbook, because everything is variable and should never be shoe horned to fit a scientist’s vested point of view.

5. *Trade barriers* should be in place to protect our agriculture, this is human fuel and as such should be treated with the greatest reverence. We should protect our natural bounty of inheritance against all the odds, it is our collective biggest treasure. Ours is a temperate climate historically, good at livestock with breeds that have furnished the world. That base is of world importance and should be maintained.

6. *The way in which land is farmed and managed*. Small farms should be encouraged. They can be very biodiverse thus protecting and saving reservoirs of species that the supermarket/mass supplies have to lose. Most importantly they provide a practical skills and knowledge reservoir.

We are experiencing a polarisation of consumers into the mass market where it is all about price and “delicatessen” where people are prepared to pay for local environmentally produced foods, which can protect all the above. Local food networks are completely sustainable and should be encouraged.

Defra as it stands at the moment can help to oversee most of the above, however I’m not sure about the Food Standards Agency [FSA] which, through the arm of its Meat Hygiene Agency [MHA], has a lot of legislative control in abattoirs. There should be a separate agency to oversee the responsibilities for pharmaceutical material, after all the FSA is supposedly a food agency.

If required I can substantiate all of the above with evidence.

*Joanna Wheatley*

*January 2009*

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**Memorandum submitted by Dr Wayne Martindale (SFS 52)**
**EXECUTIVE SUMMARY**

The UK food system is capable of being robust and resilient if the effective deployment of new technology and evidence based consumer information is stimulated and enabled. Ultimately, the equitable supply of food is determined by agricultural production which has proved resilient and robust under many pressures for over 50 years in the UK. There are now new pressures to overcome. It is clear that low crop yields and high food waste will not offer food security and that agronomic and biotechnological applications must have a clear role in developing future food security. Indeed, in some-part, recent increases in food prices have been underpinned by the taut global balance between cereal production (influenced by crop yield) and storage (influenced by waste production). It is likely that limited food supply and the need for an even more resilient supply chain will incite much innovation and this future system must fit with emergent cultural trends defined by consumer and shopper choices. However, the management of world food supply is not solvable as a yield or production issue alone. Nutritional value, consumer behavior and the infrastructure of the supply chain are all of key importance in developing a robust food system. At a global level, it is clear that the only way nine billion will live in harmony with nature and produce enough food to eat is through scientific and technological development; not removing themselves from it altogether. The complexity of our aim to develop robust and resilient food supply chains lends support to the case for the establishment of a new “centre” or “focus of multi-disciplinary expertise” that can pool research disciplines to provide information and evidence based research for users across the food chain from farm to shopper. This centre or focus would create the system wide vision for a sustainable food system that is currently lacking. The evidence submitted below considers (1) how current evidence can be used to demonstrate sustainable food production (2) determination of how best to provide evidence based information for consumers or shoppers, and, (3) the requirement to integrate production and waste supply chains.

**PART 1***How robust is the current UK food system? What are its main strengths and weaknesses?*

The solutions for achieving a robust food production system are well known and characterised. Indeed, they have recently been evidenced in UN criteria for sustainable food (and biofuel) production (FAO 2008). These criteria are relevant to the UK. Ultimately they focus on the improvement of crop and livestock yields per unit area of land. Achieving this solution represents the most efficient way of lowering greenhouse gas emissions and creating a sustainable supply chain in which producers, processors and retailers can co-ordinate activities effectively (Martindale *et al* 2008, Martindale and Swainson 2008). As yet, over fifty years of Norman Bourlaug’s agricultural legacy have shown us; yet again, that technology can defeat Malthusian attitudes to food security if we are able to implement new innovations to overcome new pressures in our food system.

The evidence provided by the Green Revolutions show beyond doubt that technological improvements in crop and livestock yield are the factors that stimulate the development of a robust food system. Furthermore, the impact of technologies used to achieve this has exposed and characterised potential weaknesses that have been consistently corrected for. These have predominantly included over-supply and the application of technology without effective knowledge exchange. These specific aspects of the Green Revolutions are consistently reviewed in a negative light by NGOs despite the overall impact of them lifting billions of people out of starvation and conserving billions of hectares of land. For example, the recent International Assessment of Agricultural Science and Technology for Development (IAASTD; <http://www.agassessment.org/>) initiated by the World Bank (Geneva) and the United Nations Food and Agricultural Organisation (Rome) reported on the potential of agricultural knowledge, science and technology for reducing hunger and poverty. However, the IAASTD also provided an outlook of precaution with regard to new biotechnologies that are largely proven to be safe. It has also exposed serious divisions between those who promote Malthusian attitudes and those who implement sustainable technologies within the global food system (with members of the IAASTD reporting committees publicly withdrawing from the IAASTD process before the assessment was published). These divisions must be considered carefully if a sustainable food system is our goal. Furthermore, the IAASTD report has provided a sense of confusion by seemingly contradicting reported requirements of organisations such as FAO (FAO 2008).

Indeed, such confusion is apparent within the UK food system and represents a potential weakness in aiming for sustainable food production. A resource for tackling such confusions and contradictions is required. Uncorrected, it will result in the inhibition of science and technological solutions entering the food chain. These factors are encouraged by a “cult of the amateur” (Trewavas 2008), the result is technological development in the food system is being mired in complex regulations, a stifling of innovation from precautionary attitudes and a lack of political will to deal with reactionary activists who, for example, damage agricultural trials. The later is particularly pertinent to the future development of efficient food systems if technologies are to be deployed globally without the threat of vandalism. Science demonstrates GM crops present no significant risk to human health or the environment, indeed, the risk of planting GM crops in the EC is vandalism of property. This situation is not acceptable and with this example in mind,

there should be no reason for British farmers and the food industry not being able to adopt the full benefit of biotechnological methods and chemical technologies to the full. Indeed, if they are not adopted with robust regulation, it is likely that the UK food system will not be sustainable.

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#### PART 2

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable? In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:- soil quality—water availability- the marine environment —the science base—the provision of training—trade barriers—the way in which land is farmed and managed*

There are currently enormous uncertainties about food production for a projected nine billion people and a rightful desire to remove poverty, the scourge of disease and food insecurity will not be achieved without linking energy, food and waste systems effectively (Martindale and Trewavas 2008). It is clear we must produce more, using what we have more effectively and the agricultural industry has a major dataset that provides a means for us to do this. These data are under-utilised and rarely communicated to the food industry, they are the global Long Term Agricultural Experiments. The UK has the oldest of these at Rothamsted, near London, and Palace Leas, near Newcastle, representing over 160 years of livestock, fodder, roots and small grain crop data coupled with environmental and biodiversity data. Globally, these experiments categorically show us how land can be managed sustainably, using the Brundtland definition of sustainability- essentially leaving resources to our next generations in a fit state. The Long Term Experiments have been exhaustively researched and written about (Rasmussen *et al* 1998) but rarely communicated to the food industry. Indeed, a US-based project resulted in the first films of the Rothamsted experiments for the agricultural sector (Vorst and Martindale 2003). Furthermore, these datasets need to be linked with economic factors and trade scenarios; this has not been achieved within the UK in any detail yet. The global Long Term Experiments show the development of minimal soil cultivations (not using the plough, where appropriate) can provide huge benefits to soil quality and stimulate soil carbon capture. A major limitation to the utilisation of minimal soil cultivation in the UK is the inability to utilise herbicide resistant crops (Martindale and Trewavas 2008). This situation illustrates the need to remain open minded to new technologies that provide environmental benefits.

A further weakness in aiming for robust food supply is the patchy provision of agricultural and food industry training in the UK that is often at a disadvantage compared to other nations where extension (extended education and Continued Professional Development) infrastructures are pro-active in technology translation, knowledge exchange and networking. For example, the agricultural extension services and agricultural college and university infrastructure of the USA offers specific food and agricultural training excellence that does not exist nationally in the UK. A further example of extension at farm level is provided by the Landcare organisation in Australia (Martindale 2004). The impact of these extension systems and lack of them in the UK, places our food system at a clear competitive disadvantage globally. Indeed, an effectively farm-based extension and training infrastructure that integrates science and technological developments with agricultural and food industry practices could provide the suggested target of 50% increase in yields by 2030. Such an extension system and vision could provide even greater yield benefits throughout the food system if production, processing and retailing were integrated responsibilities for such a service.

An example of the disregard for integrating energy, food and waste systems in food chains is provided by current biofuel policy in the EC which limits our vision with precautionary attitudes and complex regulation (Martindale and Trewavas 2008). There are clear opportunities to apply biotechnology in the development of 2nd, 3rd and 4th generation biofuels from crop and food residues (Martindale and Trewavas 2008a). Achieving this will require a synergistic development of food, waste and energy infrastructure. This is not happening currently at a national level and, in the UK remains proven by lone-innovators who are often working at localised and personal-interest levels within their own businesses. This is unlike the USA where strategic governmental programmes are providing demonstrations of 2nd generation biofuel production

from food residues (ligno-cellulosic technologies) and signalling the deployment of a clear “Billion Tonne Biofuel Vision”. Sadly, as a nation we lack this vision but hold the skills and innovators who would be able to enable it.

#### REFERENCES FOR PART 2

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Vorst JJ and Martindale W (2003) Sustainable Land Use: The Broadbalk Experiment (Film production) <http://www.agriculture.purdue.edu/broadbalk/>. Sample films of long term experiments at <http://www.mpcresearch.com/mpcresearchcom060603/rothltae/contentsfilm.htm>, The Rothamsted Long Term Agricultural Experiments. OECD Cooperative research fellowship report <http://www.mpcresearch.com/cw/webpubs/OECDfellowship1004.pdf>.

Rasmussen P E, Goulding K W T, Brown J R, Grace P R, Janzen H H Körschens M. 1998. Long-term agroecosystem experiments: assessing agricultural sustainability and global change. *Science* 282, 893–896.

#### PART 3

*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

Knowledge exchange between consumer, shopper and producer (of farm products and food items) remains an interface where ethical, evidence-based communication is an absolute requirement. The influence of non-evidence based shopper communications has created a situation where nearly 50% of Europeans believe the food they eat is bad for them according to EuroMonitor statistics (Bánáti, 2008). This is a ludicrous situation that must be tackled through utilisation of existing evidence, and, current traceability and surveillance systems including organisations such as the Regional Food Groups (see Martindale *et al.* 2008 for an initial supply chain assessment in the Yorkshire and Humber region). There is an emergent requirement for an independent centre providing expertise across the food supply chain from farm to shopper that can link evidence based science on environmental, health and economic criteria of foods. Such a centre would be able to effectively link environmental, technical, health and sustainable information about food types and product-types for shoppers and consumers. Such a centre exists for non-food crops (The National Non-food Crops Centre, York); there are no centres like this for food crops that take a farm to shopper viewpoint. Our research shows shoppers understand the health impacts of food products but the issues of environmental impact and food “miles” are less understood (Martindale and Richardson 2008). Achieving a better shopper understanding of health impacts has been achieved by the FSA “traffic light” system (Martindale and Richardson 2008). Linking environmental and health impacts offers many challenges to our current research. For example, initial studies linking Global Warming Potential (GWP) and carbon footprints to Calorie content of food products at their point of consumption show us that manufactured products and ready-made meals can have lower GWP but highest Calorie content. Placing such findings into environmentally-balanced and healthy-balanced diet scenarios is a challenge for our current work. This research has demonstrated above all else that we may need to separate the requirement to enjoy food from the requirement for sustainable consumption because shoppers will not buy what they do not like eating. This scenario raises the need to determine what “healthy balance” is in our future robust food system. Our initial research goes some way to define this (Martindale and Richardson 2008).

#### REFERENCES FOR PART 3

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Martindale W, Johnson DM, Jones M, Knight J, Towler M, Fitzpatrick S and Grant D (2008) Project FLOW Report 1: Developing Sustainable Regional Foodscapes MAY 2008 <http://www.foodinnovation.org.uk/download/files/FLOW0608.pdf>.

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry? How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

As cited above there is a requirement for a Centre in the UK food system for consumer and shopper communications that are developed from evidence based information on food production systems. This does not currently occur across supply chains. Currently, cross governmental strategies can be confusing in that they can provide conflicting messages regarding health, environment and economic criteria of food. Knowledge exchange within the food production sectors exists but much of it is currently passive, does not link across sectors (e.g. shoppers, fuel and waste) and much more can be done (see [www.foodinnovation.org.uk](http://www.foodinnovation.org.uk) Martindale 2008 for manufacturing industry based examples).

#### REFERENCE:

Martindale (2008) Launch of FIT for Food portal <http://www.foodinnovation.org.uk> (World Food Innovation Forum, Dublin November 2007)

*Suggested guidance for criteria Defra should use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

1. Engagement and knowledge exchange between industry, academia and Centres of Excellence.
2. Market entry and take-up of technologies and processes that link energy, food and waste systems.
3. The ability to export expertise from the UK that implements the food innovations required for doubling food production by 2050 globally.
4. World class research as described by University REA and REF actions.
5. Improved competitiveness globally for the UK agricultural and food manufacturing industries.
6. Ability for end-users to obtain fast, reliable, evidence based data on agricultural systems and food production. There is significant evidence to show that this is not easily available using the currently established systems.
7. Sufficient infrastructure to support the timely access to evidence based research by research users across the food system.

January 2009

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### **Memorandum submitted by The Fresh Produce Consortium (SFS 54)**

#### INTRODUCTION

1. The Fresh Produce Consortium (FPC) is the UK's trade association representing the complete spectrum of the fresh fruit and vegetable produce industry: from growers, importers, wholesalers, retailers, distributors, packers, food service organisations and other allied organisations. Among our members are a number of wholesale market tenants' associations, as well as individual companies trading at markets.

#### EXECUTIVE SUMMARY

2. FPC welcomes the inquiry by the Environment, Food and Rural Affairs Committee into securing food supplies up to 2050. We believe that the fresh produce industry has a pivotal role in helping the Government deliver its strategy "Food Matters", and welcome the recognition that long-term food security, sustainable food production and consumption must be delivered in a global context.

3. There are a number of actions identified in the strategy to which FPC and its members can contribute: from meeting strategic policy objectives to achieving food production in a low-carbon world, calculating greenhouse gas emissions from agriculture, reducing excess packaging and increasing re-use and recycling, to reducing food waste and recovering energy.

4. Until recent price rises last year there had been an actual long-term decline in real UK food prices, with the average UK household spending 9.2% of weekly expenditure on food in 2007 compared to 20% in the 1960s.

5. The UK is more self-sufficient than before and after the Second World War, with UK production of 60% in all foods and over 74% in foods which can be produced in the UK.



6. Around 60% of fruit and vegetables are imported into the UK, providing us with produce outside the UK season as well as varieties which simply cannot be grown in the UK.

7. Government investment in research and development, as well as training, is essential to ensure that the industry is equipped with the necessary resources to meet the challenges of delivering food security in 2050.

8. In addition, the fresh produce industry would welcome further support to remove unnecessary documentary processes imposed within the UK which put the UK on an unequal footing with regard to other EU member states and third countries which apply and interpret the same legislation in a less bureaucratic manner.

“GLOBAL NOT LOCAL”

9. Research indicates that about 83% of greenhouse gases are created in the production phase of food, with transportation representing only 11% of the life cycle of greenhouse gases. The Fresh Produce Consortium is working with the Carbon Trust and others to look at how we can identify sources of emissions and reduce the carbon footprint of companies and their products.

10. Sectors of the industry like the wholesale markets are well placed to provide local supplies of affordable, good-quality fresh fruit and vegetables. The potential for local markets to contribute both within local communities and their economy is significant. Independent retail markets are a key customer group for wholesale market traders and an important element of the local economy.

11. According to the Food Climate Research Network studies have shown that some imported products will have been grown or manufactured in less greenhouse gas intensive ways than their UK counterparts, with savings from greater efficiency outweighing negative impacts of additional transport. It is therefore essential to balance transport emissions with other factors when evaluating and fully understanding the environmental impact of fresh produce, regardless of its origin.

12. Encouraging a healthy diet. The total quantity of fruit and vegetables marketed in the UK in 2006 was 8.1 million tonnes. Since 1996 the market volume has grown by 1.2 million tonnes, or 16.8%. The market still has the potential for further expansion in order to meet consumption targets of 5-a-day. If the entire UK population were to eat the recommended 5-a-day, actual consumption would be in the region of 8.8 million tonnes.

13. In addition, the industry's campaign “Eat In Colour” is ideally placed to provide consumers of all ages with advice on how to enjoy eating healthily and to reach the recommended 5-a-day target. We recently published the findings of a TNS consumption survey which indicates that on average consumers are eating 2.5 servings of fruit and vegetable a day. Without a dramatic change in eating habits it could take another 25 years for consumers to meet the recommended 5-a-day.

14. With rising obesity levels across Europe it is essential that we encourage more people to eat fresh fruit and vegetables and that we can continue to provide a sustainable supply of fresh produce against the challenges of feeding an increasing world population, competing pressures on agricultural land and the impact of climate change.

15. *The role of Defra.* FPC wishes to ensure that consistent standards allow businesses to trade effectively in the UK and across Europe. We are concerned that the revised Marketing Standards, as stated by EU and UK Government representatives, are being promoted as a simplification when in effect, subject to clarification of Defra's interpretation, they are likely to introduce additional layers of bureaucracy, complexity and cost to the fresh produce industry.

16. Over and above the specific Marketing Standards for ten types of produce, the introduction of a new General Marketing Standard for all fresh produce means that products which have not been included previously will be covered by the new Regulations. We assume that this will require the industry to register details for import notification for a considerably greater number of products via the online PEACH system which will certainly increase both workload and cost to the industry.

17. The Regulations are due to come into force on 1 July 2009 and we are still awaiting the start of a full consultation with the fresh produce industry. Our concern currently is that we will not have enough details or sufficient time in which to make a meaningful contribution to assist with the effective implementation of these new Regulations.

ENSURING HORTICULTURE CAN MEET THE CHALLENGE OF INCREASING GLOBAL FOOD PRODUCTION

18. The European Parliament's recent vote in favour of removing key products which are vital for controlling pests, weeds and diseases will jeopardise the ability of European horticulture to supply good quality affordable produce in a safe sustainable manner. Critically, this decision has been made with no full assessment of the wider impact on food supply.

19. Growers already have a limited range of products to protect horticultural crops, and in some instances there will be no viable alternatives for treating common pests which reduce yields and damage fresh produce. It may become uneconomic to grow some crops such as sprouts and carrots, and lower yields will mean hard-pressed consumers will have to pay higher prices for their fruit and vegetables, including apples, pears, raspberries, leeks, peas and beans.

20. Around 1.9 million less well off people in the UK are eating less than one serving of fruit and vegetables a day. Increasing food prices would deter them further from enjoying a healthy diet, adding to concerns about rising obesity levels and poor health.

21. In addition, it could become harder to manage pests and diseases globally. A limited range of crop protection products could lead to the intensive use of surviving active substances, increasing the risk of spreading resistant strains of pests and diseases.

22. International trade could be affected. A substance banned in the EU could still be used on produce imported from third countries. In theory the Commission should allow an import tolerance if supported by appropriate data, however this would allow produce to be imported which may contain residues of substances not approved in the EU. Refusing to grant an import tolerance despite risk-based evidence of safety being presented by a non-EU country could lead to a challenge by the World Trade Organisation.

23. The horticulture industry already leads in the adoption of integrated pest management systems and we will continue to press the UK Government and others to ensure that the industry has the necessary tools to provide a sustainable supply of fresh produce.

#### INTEGRATING SYSTEMS AND USING ELECTRONIC PROCESSES

24. A report by SITPRO (“The cost of paper in the supply chain” 2008) found that the current documentary systems cost the perishable food supply chain more than £1 billion annually.

25. UK perishable food imports for 2005 were valued at £25,960 million (flowers: 3.4%—£876 million; vegetables and vegetable products: 98%—£2,535.1 million; fruit and fruit processes: 11.9%—£3,097 million). Exports from the UK totalled £10,761 million (flowers: 0.5%—£48.6 million; vegetables and vegetable products: 2.9%—£313.6 million; fruit and fruit processes: 8.3%—£892.8 million).

26. The cost of document-related administration in the sector is estimated to be around 11% of the supply chain value per annum, with the generation of paper-related documentation estimated at £126 million a year. Nearly 13 million man hours in 2005 were estimated to have been taken up with entering data, chasing late or missing documents or preparing claims for deferment monies deposited with HMRC, equating to over £354 million a year.

27. A single consignment transaction, from grower to retailer, can comprise up to 150 documents (or up to 225 pieces of paper) which results in duplicate elements of information being entered up to 42 times.

28. There is enormous scope to simplify procedures between importers, exporters and authorities, and to integrate electronic systems to reduce these costs to the fresh produce industry. According to the SITPRO report, with the introduction of e-documentation and shared data through a “single window” the chilled food industry could save at least £700 million, around 70% of the costs, and benefit from fewer inspections of consignments, and reduced clearance processing time. The fresh produce industry represents about 25% of the chilled food industry, and therefore could save around £175 million according to SITPRO’s estimates.

29. There is evidence that several Government departments and agencies often require the same documentation, leading to duplication of resources by the industry. Improved sharing of data, transfer of documentation and better integration of Government departments and agencies would also reduce unnecessary bureaucracy.

#### GOVERNMENT INVESTMENT—RESEARCH AND DEVELOPMENT, AND TRAINING FOR FUTURE WORKFORCE

30. There is a need for Government to invest further in research and development to support the industry. It is vital that the industry continues to make advances and develops the necessary tools to meet the challenges of increasing food production.

31. Government support is needed to encourage young people to develop careers in food production and to provide the necessary training. The fresh produce industry has to compete with other industries which have greater investment in this area and which are perceived as more attractive by a younger generation.

### Memorandum submitted by The Royal Academy of Engineering (SFS 55)

The Royal Academy of Engineering welcomes the EFRA Select Committee inquiry on “Securing food supplies up to 2050: the challenges for the UK” and is pleased to submit evidence. This response has been compiled using contributions from appropriate Fellows of the Academy and from a meeting held in October 2008 on *Engineering and Global Food Security*.

#### EXECUTIVE SUMMARY

1. Food security is a complex issue that will require leadership from the Government and interdisciplinary working between farmers, scientists, engineers, policy-makers and consumers. An integrated and systematic policy approach is needed to address properly the interdependent issues affecting the food industry.

2. The Academy is not aware of a coherent cross-Government food strategy with clear and well publicised aims. Within Defra there needs to be better integration and communication.

3. The Government must encourage food production alongside consideration of environmental issues, and develop policies that reflect the dual aims of increasing food security and preserving the countryside.

4. Significant food wastage occurs in the UK. Government and the science/engineering community must help to communicate the right message in order to effect changes in consumer behaviour.

5. It is important for the UK to consider the relationships between food and energy and to seek ways to improve energy intensive processes. This will reduce the sensitivity of the food system to oil and gas prices.

6. The UK’s water drainage infrastructure must be reinvigorated and properly maintained. There should also be significant investment in water storage to allow for more efficient irrigation and water distribution on a national scale.

7. The UK has indirectly reduced its engineering skills capacity through a range of policies. Over the last few decades training provision has declined, particularly in the applied areas of food production and agricultural engineering.

#### 1. *How robust is the current UK food system? What are its main strengths and weaknesses?*

1.1 The UK food system is reasonably robust. The UK produces around 60% of its food, particularly in temperate products such as grains, oilseeds and vegetables.

##### 1.2 Strengths include:

- Mild climate with adequate rainfall and fertile soils.
- Large farms (compared to some EU countries); this is important for better land efficiency.
- The top UK farmers are also world leaders in agricultural methods.
- Very robust quality assurance and control systems are in place and enforced.

##### 1.3 Weaknesses include:

- Lack of legislative support over recent decades, with generally more emphasis on preserving the countryside than primary food production.
- Perceptions caused by periods of food surplus in Europe (i.e. the “grain mountains”), that led the Government and consumers to believe there wasn’t a global food shortage problem but a distribution problem. Although the global situation has since changed, this belief is still fairly widespread and hinders the UK’s prospects for food security.
- Insufficient consideration of the energy and carbon costs involved in food production.
- Lack of effective applied research and knowledge transfer services to deliver research messages to farmers and feedback to researchers.
- Land scarcity; the land area available to farming in the UK is approximately one third of a hectare per person, making land the most limited input to agriculture. To maximise yields from limited land, farmers rely on intensive methods and the substantial use of fertilisers, chemicals and fuel which causes the cost of food production to be sensitive to oil prices.

#### 2. *How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

2.1 As a result of the weaknesses detailed in section 1 and other factors, the UK is not currently well placed to make a major contribution to increasing the world supply of food. However, the UK should be able to meet a larger proportion of its own requirements, and thus contribute to increasing global food production if certain actions are taken.

2.2 By 2050, because of mounting concerns over energy sources and environmental impact, it will be necessary to have found a way to either reduce the amount of energy required for the Haber Bosch process (the energy intensive method by which nitrogen fertiliser is produced) or find an alternative process/source. Here the role of chemical engineers will be particularly important. Maintaining soil quality is vital for sustainable food production, hence the importance of the nitrogen fertilisers. Using existing technology, biowaste and compost could also be modified and applied to fields to maintain soil fertility.

2.3 New technologies should be fully exploited where appropriate to increase production sustainably. Nitrogen and water use efficiency could be improved using plant and animal genetics research to develop crops and agrochemical equipment, and employing precision farming methods to reduce wastage during application.

2.4 In order to sustain a robust glasshouse industry renewable energy sources or more efficient processes will be required. The UK should explore how the Dutch manage an effective glasshouse industry utilising waste heat from power stations. Utilising waste heat to warm soils can also have a positive impact on productivity.

### 3. *In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system?*

#### 3.1 Water availability:

- Irrigated agriculture accounts for 1% of UK water abstraction and 4% of the crop area, yet accounts for 20% of the crop value.
- There needs to be significant investment in water storage to allow for more efficient irrigation and water distribution on a national scale. The number of on-farm storage reservoirs could be increased and precision farming methods could be used to apply water more effectively.
- The water drainage infrastructure has been poorly maintained since Government subsidies were removed in the 1980s; this will become increasingly problematic as the delayed effects start to show. The drainage infrastructure must be reinvigorated and properly maintained. Studies have shown that strong relationships exist between drainage and yield. For example, in 2007, Birds Eye lost 40% of its pea crop due to heavy rainfall and poor drainage.

#### 3.2 The science base:

- The UK food science base is reasonable at the moment, but lacks adequate funding to safeguard it for the future.
- The incorporation of the Agricultural and Food Research Council into the Biotechnology and Biological Science Research Council in 1994 has resulted in a loss of focus on food research in the UK.

#### 3.3 The provision of training:

- The UK, once an international leader in the provision of services, has indirectly reduced the engineering skills capacity through a range of policies. Over the last few decades training provision has declined, particularly in the applied areas of food production and agricultural engineering.
- Training facilities are not attractive and the food industry has a reputation of poor rewards for long hours.

#### 3.4 Trade barriers:

- The dominance of the “Big 4” supermarkets imposes distortions in the market place and reduces competitiveness through effects on various parts of the supply chain.
- EU quotas and tariffs limiting the production of foods in the UK (e.g. milk) reduce opportunities to become food secure.

### 4. *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

4.1 It is likely that there will be a continued decrease of home-cooking caused by changes in lifestyle. This will increase the demand for packaged and processed foods.

4.2 Developments in technology (e.g. machinery, genetics, chemicals) will continue to become available. However their acceptability to consumers, and therefore their adoption, will be questionable. In the case of genetic modification there is still a lack of consumer acceptance in the UK.

4.3 Due to superficial quality standards particularly for fruit and vegetables, there is significant food wastage in the UK. Consumer and supermarket-driven standards feed back into the supply chain, often resulting in fruit and vegetables not being harvested by farmers. Additionally, an estimated 25% of all fresh produce is thrown away by consumers after purchase. Government, along with the science/engineering community, must help to communicate the right message in order to effect changes in consumer behaviour.

4.4 Dietary preferences for meat protein increase pressure on farming as vastly more land, water and feedstock is required to produce meat than plant-based foods. The global demand for cheaply priced meat is increasing.

4.5 It is likely that there will be an increase in the trend for local production. Much more use could be made of local food networks. However the importance of convenience to the consumer means supermarket chains are likely to remain dominant. For local food networks to be viable across the UK there would be significant logistical and operational changes required. The current value of the pound against the Euro could now encourage more home production.

5. *What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

5.1 The Government must encourage food production alongside consideration of environmental issues and develop policies that reflect the dual aims of increasing food security and preserving the countryside. Past schemes such as set-aside land initiatives have disincentivised the farming community from increasing production.

5.2 The decline of agricultural research centres in the UK has significantly reduced agricultural research capacity. Defra could now take a more strategic long-term view of what research is needed and maintain strategically important areas.

5.3 Food security is a complex issue that will require leadership from the Government and interdisciplinary working between farmers, scientists, engineers, policy-makers and consumers. An integrated and systematic policy approach is needed to address properly the interdependent issues affecting the food industry.

5.4 Technology can help increase food production and has historically resulted in many agricultural revolutions. In the UK, leading up to 2050, changes in consumer behaviour, trade barriers and agricultural policies could have a comparable impact to technology.

6. *How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

6.1 The Academy is not aware of a coherent cross-Government food strategy with clear and well publicised aims. Within Defra there could be better integration and communication.

7. *What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

7.1 It should be possible for Defra to monitor the UK's progress using its existing statistical collection methods, although measures for sustainability may require further development.

January 2009

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**Memorandum submitted by Jill Sanders (SFS 56)**

Our food chain is more vulnerable than it has ever been. Very little is produced locally or on a small scale. The great majority of our food supply is beyond the control of those who consume it. The chain of production and delivery is uniquely at risk of just about anything and everything that could occur from point of growth to plate: disease, maintenance of energy supplies and freedom of movement, commercial interests, consistency of supply and demand and much more. Imagine any shortage of any product significant to a healthy household: panic at the supermarkets.

I am typical of thousands of small growers across this country, and there could be many more households like ours. We have an allotment on the Thames alluvial flood plain in East Molesey, Surrey. The soil is good, with a topsoil layer of probably something approaching one and a half to two spits (spade lengths). We improve the soil with organic farmyard/stable manure annually and our own compost made from organic vegetable matter. We also rotate our crops to minimise pests and disease build-up. We work the soil each winter in order to expose it to the beneficial effects of frost. The health and condition of our soil is important to the success of our crops, and it never ceases to amaze me how fertile it is and how much we can grow on a small area. We can secure a significant proportion of our own food supply, which we augment with hens in the garden. Many more people could do the same with more allotments and better utilised allotments and gardens. This form of resilience (i.e., providing one's own food) should be encouraged and developed because the interest is very much there among individuals and local communities right now. Surpluses could

be used locally, perhaps to provide schools—we have one opposite our allotments but there are no links—and local greengrocers and farmers’ markets. If we are looking at reducing food miles, this is the sort of thing to encourage.

We run our allotment along organic lines, though we occasionally use a topical proprietary application to nip blackfly in the bud when there is no real alternative: an infestation can leave you without a successful crop of beans, for example. In the main we propagate our seeds in a small plastic “green house”, which is just a series of shelves inside a polythene cover, before planting them out in spring, after the danger of frost has passed. The trick is to propagate plenty of seeds so that if some young plants fail you have more ready. We find that on the whole there is no requirement for chemical sprays or other measures to repel pests. Healthy crops do well, and we have no objection to our indigenous birds having a share of the soft fruit. Where there is a need to protect, we simply put some netting over for the duration.

Physical measures are used to manage weeds. We find that weeds grow back where other allotment holders apply herbicides. Our method is to dig clean edges to define the growing area and to water only the growing plants. This we do by hand, with topical application of water from a can to the roots of the plants. This does not have to be done every day, even in drought conditions, and it makes for strong and healthy plant growth. It brings the added benefit of discouraging pests, especially slugs, which flourish in warm, moist conditions. This is the method I have observed used by Ugandan farmers, who are first class growers often cultivating two or three crops at one time (beans beneath coffee trees, for example). I have managed to make myself a tool that is widely used in Africa by farmers growing vegetables: the hack hoe. This is a lot less strenuous than the fork as you don’t lift the weight of the earth but just turn it and pull it. I have seen very elderly men and woman farming with a hack hoe.

I tell you this to let you know what is possible because you may not have this knowledge. Having described what we do, how we do it, and what we derive from it, I believe there are answers here for Government, bearing in mind the Committee’s terms of reference and series of questions. Right now, in January, I have many, many jars of bottled fruit in safe storage awaiting consumption—rhubarb, apple, soft fruit coulis, jams. I also have even now a two to three month supply of potatoes and onions in sacks in the shed. There are still parsnips, carrots, beetroots and leeks in the ground as winter crops, and I have been able to cut spinach up until the recent frosty weather. I also dry apples and tomatoes in a low-energy consumption dessicator which then keep very well in jars tied off with greaseproof paper, with some sugar for the apples and some salt for the tomatoes as an indicator that the produce is good and dry.

I have not been a food producer before, but in the past few years have accumulated these skills and knowledge. Early in 2008 I felt we might need to seriously produce food so this year—just a gut feeling—we put a lot more effort into it. I also work full time, so it is quite possible to find time in a busy life to grow your own food locally.

There are very many advantages to learning about, growing, harvesting and storing food produce, as I am sure the committee will appreciate from this submission. I know that in the war this was fully appreciated and most people kept hens and grew crops of some kind. Also, areas were made over to vegetables and fruit. I would like to see, for example, community orchards of apples, pears, plums, damsons, etc. Grapes grow well, as do soft fruits like raspberries, blackcurrants, gooseberries and other native fruit. Food could be grown on school grounds and corners of parks, waste ground and land owned by utilities, councils, care providers and voluntary and community organisations. Why don’t we have some local food champions who would be willing to work with teachers, students, youth clubs and others in a position to become food producers?

If I can run a household allotment and garden that produces almost more than we can eat, and with a range of foods, I don’t see why the population of any temperate country should go short. For myself, I feel more secure for having a resilience that comes with a personal food supply. Should it be necessary, I could probably feed our household for six months, even now at this time of year when we have gone through many of the stores. And my situation is sustainable—there will be more again next harvest. And there is more we could do—bee-keeping for example.

As regards Government policy, I don’t think it is coherent or joined up, or practical. If it were, there would be robust working connections between DEFRA and the departments for schools and local communities, to take advantage of and benefit from locally growing food. Most of us are city-dwellers now, but this kind of activity can re-connect us all with the earth and living things as well as giving us skills and healthy outdoor exercise. You can grow many crops in pots—there is no reason why anyone with a patio, balcony or window sill couldn’t get involved. There is also a great sense of reward and satisfaction from presenting and eating your own produce. Now is the time to tap into society’s increasing awareness about locally produced food and seasonal produce.

The UK’s food system is not robust, as we see any time there is a disease or a scare—especially among animals. The dependence on a complex logistical network of far-flung suppliers, how these are monitored and how the quality of the produce is assured, what chemicals and drugs are applied in the agri-industry, how well the food is stored and preserved—all these things concern people and impact on the health of not only the humans that eat the food, but also the wider environment and the animals themselves.

Supermarket-bought food puts us at risk of everything, we can know not what: from food poisoning (it's a leap of faith to consume pre-prepared dishes that require no heating, like pate for example); from busy lorry-filled roads; from chemical usage/dosage in mass production.

I should like to see an emphasis on local food production down to an individual and community level to build resilience widely. When the chips are down, grow your own potatoes—it's the best thing you can do. We can reacquire the skills they continue to practise in Africa because they know their importance, skills that our grandparents had.

*Jill Sanders*

Allotment holder and small grower

*January 2009*

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### **Memorandum submitted by the Campaign to Protect Rural England (CPRE) (SFS 59)**

#### SUMMARY

1. The value attached to the food supply system by society is very closely linked to the animal welfare and environmental outcomes of farming and food production

2. Key strengths of the nation's farming industry include good animal welfare standards, effective agri-environmental schemes and close association with the great variety of landscapes found in Britain. These are at risk from narrowly productionist farming.

3. The three processes most likely to damage locally distinctive landscapes and habitats on a wide scale are abandonment of less rewarding farm land, ruthless rationalising of farming techniques to cut costs, and renewed and increased intensity of farming on productive land.

4. From research CPRE undertook with the NFU, it appears that a weakness of England's food production system is the reliance of some farmers on the CAP Single Payment to remain economically viable.

5. We would like to see the CAP evolve into a new policy that delivers sustainable land management, a European Sustainable Land Management policy. The policy should reward farmers for the full range of environmental public goods that are produced through farming activity, while also being compatible with sufficient provision of high quality food and other production.

6. The onset of climate change means far more uncertainty than ever before over the viability and productivity of farm land everywhere in the world. Competitive advantage may one day come to our relatively temperate climate and rich soils in the event that growing conditions deteriorate in major commodity and food producing parts of the world.

7. A strategic approach to the integration of soil and farm land protection across all sectors of Government policy is thus urgently needed given the existing, accelerating and competing pressures on land.

8. We believe there will be an increasing need for research into how food production and environmental protection and enhancement can be successfully integrated and expanded. CPRE also believes an increase in the provision of agricultural training is vital for the future of sustainable farming in the UK.

9. There is a serious risk that a solely production and target led approach could lead to a level of environmental degradation through intensification last seen in the 1980s.

10. CPRE strongly believes that our farming industry is an immensely valuable national asset, with strategic, technical, environmental and societal contribution to make beyond the calculation of contribution to national prosperity from food and commodity production.

11. The monitoring of the effects of increased production should include both quantitative and qualitative measures, including landscape quality, biodiversity, archaeology and the viability of local food networks.

#### SUBMISSION

1. CPRE has led the debate about the purpose and the future of the countryside since its foundation in 1926. We have worked with successive Governments to ensure that the incomparable asset of the English countryside is retained and enhanced for future generations. CPRE works for a beautiful and productive countryside for both present and future generations.

2. We are closely involved in the debate over the connection between food production, rural businesses and communities and planning policy. We have pioneered work on these relationships (*Food Webs*, 1998 and *The Real Choice*, 2006). We are now continuing this work through *Mapping Local Food Webs*, a lottery funded project that will map local food networks and identify their benefits to local economies, communities, farmers and the countryside.

3. CPRE does not own land and this means that the perspective of our policy judgement is sometimes usefully different from that of leading land-owning environmental NGOs.

4. CPRE acknowledges the crucial role that food production plays in the management of the English countryside. We are also strongly aware of the importance of sustaining a farming community which has this expertise, together with the associated professions and businesses: veterinary practices; machinery maintenance, markets, product processors and trade support.

5. We gave evidence, both written and oral, to the House of Commons EFRA Select Committee during their inquiry into the Government's CAP Vision document (February 2006) and to the House of Lords European Union Committee, Sub-Committee D (Environment and Agriculture) inquiry on the Future of the Common Agricultural Policy (June 2007). We also recently responded to the Defra discussion paper, "*Ensuring the UK's Food Security in a Changing World*" (September 2008).

6. Our responses are framed within the following question which CPRE believes is crucial to the issue of securing the UK's food supplies:

*What should be the extent of land used primarily for food production and how should this be influenced by prioritising built development, protection of the natural environment or opportunities for innovations in research, technology and land management policy?*

*How robust is the current UK food system? What are its main strengths and weaknesses?*

7. CPRE considers that the terms of reference for answering this question need to be broad. Many of the things which our society regards as strengths in our food system are related to the environmental quality associated with food production.

#### *Strengths*

8. We would draw the Committee's attention to two important strengths of much English farming which are of great importance to the majority of the population. These are good animal welfare standards and thorough implementation of EU Directives and policies aimed at improving the environment whilst conducting productive farming. The UK and British farmers has shown leadership in developing agri-environment schemes amongst EU member states. However, implementation of the Water Framework Directive and Nitrate Vulnerable Zones has been slow, and the Government and the farming lobby have opposed the development of a Soils Directive.

9. At the same time, CPRE notes that EU environmental and animal welfare legislation, agri-environment schemes and cross compliance are often alleged by some of the farming lobby to reduce the potential for viable food production in the UK. An alternative might be that farmers could elect to produce food to lower quality and environmental standards. Quite apart from environmental considerations, CPRE is unconvinced that this would be an economically sustainable route. It would relinquish the opportunity to benefit from the marketing advantage of added value and a reputation for quality. The farming element of the food system in this country remains, for the time being, within striking distance of re-establishing the valuable reputation of the farmer as hero. This should not be forgotten in a future dominated by production-led thinking.

10. CPRE believes a key strength of the England's farming is its close association with the variety of England's landscapes. The significant intensification or rationalisation of agriculture in England would have far more destructive consequences for landscapes and habitats than in many other countries. This is because of the intimate association over millennia of the productive use of land, wildlife habitat and the character of the landscape, by comparison with places in the world where productive agricultural land and biodiverse wilderness are much more segregated. Examples include much of Canada, the USA and the formerly collectivised farmland of some central European countries. An extract from a speech by CPRE's president, Bill Bryson eloquently describes the contrast between the quality of farmland in England and other countries. "*If you suggested to people in Iowa, where I come from, that you spend a day walking across farmland, they would think you were mad. Here walking in the country is the most natural thing in the world, so natural that it is dangerously easy to take it for granted.*"

11. This harmonious relationship between farming and the environment is vulnerable, however. Significant restructuring of farming in England could lead to networks of semi-natural landscapes (our farmland), with combinations of management to which the majority of native species have adapted, gradually being lost. The variation across the country, expressed in the style, scale, age and pattern of field boundaries, woodland, farm buildings, livestock, crops and soil, would be suppressed or allowed to degenerate. The three processes most likely to damage locally distinctive landscapes and habitats on a very wide scale are the abandonment of unrewarding land, ruthless rationalising of farming techniques to cut costs, and renewed and increased intensity of productive farm land. All three are very likely if farming is encouraged to respond in an unmitigated way to market pressures and opportunities.



*Weaknesses*

12. From research CPRE undertook with the NFU in 2006 it is clear that a weakness of the UK's food production system is the reliance of many farmers on payments from the CAP to remain economically viable. The Government's *Vision for the CAP* (December 2005) supports the ending of the CAP. The cessation of the Single Payment is likely to have a profound impact on the profitability of some businesses, communities and families engaged in farming and land management. Some beneficial land management activities will become less easy to accommodate within farm businesses calculations. Means need to be found within an international agricultural trading system of providing sufficient incentives to ensure these continue where they are necessary. Where more competitive farming is likely to bring pressure for environmentally harmful activities, avoidance of these should be encouraged. Otherwise, the indirect costs to society in terms of soil and water quality and condition, as well as landscape and wildlife damage, will escalate in the long term. The recent results of the ten-yearly Countryside Survey by the Centre for Ecology and Hydrology suggest a gradual overall coarsening of biological communities associated with farm land. CPRE recommends that the Committee considers this evidence carefully in its inquiry.

13. Before the CAP was established, national agricultural policies which damaged the environment were pursued explicitly in the name of food security. During the last twenty years, a gradual shift in funding, regulation and objectives on the part of Government, farmers and environmental NGOs has started to slow and in some cases reverse the damage with very little reduction in efficiency. Welcome animal welfare obligations have, in particular, imposed increased costs on the livestock sector. The issue of food security raises a variety of questions beyond the merits of the case itself: whether or not there is a need for "critical mass" in farming; the level of resilience of English farming businesses to world competition; the question of the export of environmental damage through the raising of environmental standards at home and the threat of these standards to our own farming communities.

14. CPRE is committed to helping the reconciliation of the national asset of our farmed landscapes on behalf of the whole population, farming interests and rural communities, and the demands on farm land and rural settlements which introduce urban, suburban, recreational or industrial processes and development. The new demands on land all make increasing demands on the use of land and the skills of those who manage and make a living from the land. We recognise that the competition between different interests is increasing. It is, therefore, becoming more important to establish clear policy objectives for the use and appearance of the countryside and to ensure clear processes exist to make choices over the nature and extent of rural development.

15. CPRE would like to see the CAP evolve into a European Sustainable Land Management policy. The policy should reward farmers for the full range of environmental public goods that are produced through farming activity, while also being compatible with sufficient provision of high quality food and renewable energy. Such a policy should avoid relying heavily on a global approach to food and energy security focused purely on markets which will be susceptible to extreme weather, global or regional economic instability and political events that could disrupt supplies.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

16. Opportunities for responding to the challenge of increasing global food production should not be calculated in purely productionist terms. CPRE believes it would be perverse for the UK to deplete the quality of its natural resources and its environment in a drive for production. The globalisation of food production has failed to address the critical issue of making sure supply and distribution networks deliver food to where it is most needed whilst avoiding serious environmental degradation. There is a need for caution in determining how much this country can contribute to targets for food production given its land area and society's commitment to high ethical and environmental standards.

17. Paradoxically, climate change could actually make the United Kingdom's farmland more valuable in global terms for its relative resilience and versatility. We will need to respond to the demands for energy production from land when the climatic pressures might set greater store (and greater price) by increased food production. Competitive advantage may one day come to our relatively temperate climate and rich soils in the event that growing conditions deteriorate in some major commodity and food producing parts of the world. Even if climate change is less severe than anticipated, there are likely to be very serious shortages of water for agriculture in many parts of the world in the near future. Our own relatively efficient use of water in food production will become a more valuable factor in world food production.

18. There is, in the opinion of CPRE, a serious risk that target driven food production policy could bring about the levels of landscape and habitat degradation associated with the early to mid 1980s. We suggest that this would, in the long term, be very damaging to farming interests. Society has spent the last 20 years paying handsomely to undo some of this damage.

19. Meanwhile, farming in this country is also put at a disadvantage through the serious decline in indigenous agricultural research and innovation work. As well as contributing to increased productivity overall, research could contribute far more to helping farming deal with changing climate, enhance production on a similar area without damage to the environment and finding new high value crops and low cost, effective cultivation and husbandry. In particular CPRE considers it to be an urgent priority to expand support and funding for research institutes beyond the ambit of university departments.

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system? Soil quality; water availability; the marine environment; the science base; the provision of training; trade barriers; the way in which land is farmed and managed.*

- (i) *Soil quality*—CPRE has pressed for recognition of the importance of soils for over a decade. We have called for Government to protect soils more effectively by: linking agricultural support to good soil management practices; revision of the Agricultural Land Classification (ALC) system; raising the profile of soils in the planning system; and supporting the proposed EU Soil Framework Directive. Across the policy spectrum soil and the land space it occupies does not have the same priority in terms of environmental protection as air and water. A strategic approach to the integration of soils protection across all sectors of Government policy is urgently needed given the existing, accelerating and competing pressures on land. CPRE does not believe that current planning policy with respect to Best and Most Versatile (BMV) land gives adequate recognition to the importance of soils. The existing planning mechanism is now weaker, since the publication of Planning Policy Statement 7 in 2004. Previously, national planning policy stressed that BMV land “*should be protected as a national resource for future generations*” (para. 2.17) and so “*land in grades 1, 2 and 3a should only be developed exceptionally, if there is an overriding need for the development*” and other land of lower grade and without overriding environmental value could not be found (para. 2.18). Under PPS7 protection of soils was downgraded and given parity with “*other sustainability considerations*”, with the inevitable effect of making the sealing and loss of versatile agricultural land more likely.
- (ii) *Water availability*—CPRE believes that because of climate change there is an inherent danger in locating the majority of our arable crop production in the East of England. This emphasises the danger of the polarisation of single sectors in different regions of the UK. If the new demands of protecting water resources and managing the volumes, velocity and quality of water flows are added to farmer’s ecosystem services management responsibilities, we have a huge portfolio of activities that place additional constraints on food production. These will require additional funding to agri-environment schemes.
- (iii) *The science base*—CPRE is pleased that the Government now recognises the importance of agricultural research given the recent withdrawal of funding for Rothamsted and the closure of some of the Centre for Ecology and Hydrology research facilities. We note that £400 million is to be provided over five years for international research and that Defra spends half its research budget of £300 million per year on the farming and food sectors. We believe there will be an increasing need for research into how food production and environmental protection and enhancement can be successfully integrated.
- (iv) *The provision of training*—CPRE believes an increase in the provision of agricultural training is vital for the future of sustainable farming in the UK. It is interesting to note that there now appears to be a polarisation between training in agricultural skills and traditional land management skills where once these would have been one and the same. CPRE looks to rural development measures to provide the training needed. However, current levels of funding have meant the Government has had to prioritise agri-environment measures.
- (v) *The way in which land is farmed and managed*—CPRE believes there is an urgent need for the CAP to evolve into a system of support for land management with a range of public benefits clearly stated as objectives. This could deliver public goods through farming which would compete in world markets. The attendant public benefits of competent and responsible agriculture would be accommodated through the financial support of a land management fund. CPRE strongly believes that our farming industry is an immensely valuable national asset, with strategic, technical, environmental and societal contributions to make far beyond the calculation of contribution to national prosperity from food and commodity production. Most of the landscape, access and habitats that we value require management which is intimately associated with the productive use of land. Our joint report in 2006 with the National Farmers Union, *Living Landscapes: hidden costs of managing the countryside*, illustrates this point very clearly. We identified landscape management activity conservatively estimated at £412 million per year, beyond that directly stimulated or required through agri-environment schemes. This figure takes no account of work dedicated to wildlife management by farmers which will not always overlap with the landscape work we recorded in our research.

*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

20. CPRE has campaigned on local food since the late 1990s and this work has combined understanding of local food economies, landscape management, retail planning policy and the distinctiveness of market towns. The work has built on Caroline Cranbrook's seminal *Food Webs* report (CPRE 1998) on the local food network—or food web—in the market towns and villages of East Suffolk. Further research in 2004 into the East Suffolk food web was published in *The Real Choice*. This emphasised the importance of local food to the survival of local retail infrastructure, enterprise, land management, diversity of the area and general economic, social and environmental well being.

21. CPRE joined a partnership led by Plunkett Foundation in submitting a bid to the *Changing Spaces* Programme of the Big Lottery Fund in 2006. CPRE's part in the programme is a joint project with Sustain to equip local community groups to survey and document their local food networks, and to disseminate these findings at local, regional and national levels to promote supportive policy change. The full portfolio of projects is entitled "*Making Local Food Work*". The programme aims to show how the needs of land and people, producers and consumers are interdependent, and that community enterprise can make this connection in a mutually beneficial manner

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

22. CPRE believes that a key factor in making the UK food supply system resilient is to maintain diversity of production. This suggests the role of supermarkets in influencing the scale and location of production needs to be tackled. The proposed impact test in draft Planning Policy Statement 6 should work to increase diversity of sources of supplies of food, not restrict it. If the proposed impact test fails to retain the diversity of food retailing this could lead to a reduction in entrepreneurial stimuli with fewer more dominant retailers.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross Government food strategy?*

23. The need for Government departments to work together is illustrated in the drafting of Planning Policy Statement 6 by the Department of Communities and Local Government. The cause of viable local food networks could be greatly strengthened if there were closer collaboration between Defra and DCLG. CPRE welcomes the Foresight study on future land use challenges. This includes the Government Land Use Project led by Defra to identify "*the policy tools and levers needed to optimise our use and management of the land*" to 2050 and beyond. Departmental relationships with the Treasury will be of particular importance due to the ongoing review of the EU's Budget which could have important consequences for funding of the CAP and rural development measures.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring there such production is sustainable?*

24. Defra should consider amending PSA targets to take account of the potential pressures of increasing food production. Environmental monitoring criteria that will be needed to measure the sustainability of food production should include landscape condition, archaeology, biodiversity, (through existing PSA targets and the Countryside Survey) soil, water, and carbon emissions. CPRE is concerned that quantitative measurements are likely to be favoured over the more difficult task of qualitative monitoring of the effects on the environment of increasing food production. However, it is the qualitative experience of the countryside that visitors care about most. It is our view that it will be essential to monitor changes to landscape character through further development and expansion of landscape character assessment such as Natural England's *Countryside Quality Counts* work.

CPRE

January 2009

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**Memorandum submitted by The Royal Society for the Protection of Birds (SFS 60)**

**SUMMARY**

1. The environment must be recognised as the productive base of agriculture. Protecting and enhancing the environment will in turn secure the ecosystem services it provides, including food.
2. Intensive farming systems which maximise production produce negative environmental outcomes including greenhouse gas emissions, biodiversity declines and degraded water and soil quality, which can significantly degrade food production capability. Climate change will also drastically alter the way food can be grown in the future.
3. Although the global population is projected to increase significantly by 2050, there is no immediate need to significantly increase food production as current production levels are expected to satisfy global calorific demands until approximately 2030.
4. Meeting the challenge of growing food sustainably will require producing nations to develop productive systems which respect the carrying capacity of the land and enhance environmental quality within a context of climate change.
5. Governments should develop strategies to address unsustainable or inequitable consumption and food distribution patterns, including food waste.
6. The UK has limited capacity to contribute to doubling global food supplies by 2050 but its continued food production is important to maintain domestic supplies and a stable global trading system.
7. Developing countries must have support to develop their own productive capabilities in a sustainable way. The findings of the IAASTD report should be fully assessed as a contribution to this process.

*How well placed is the UK in responding to the challenge of increasing global food production, while ensuring that such production is sustainable*

8. The need to grow more food for a growing global population must be viewed within a broader context: by the time food production must be doubled, climate change will have started to radically alter the way food can be grown. The recently published UN and World Bank sponsored IAASTD report (International Assessment of Agricultural Science & Technology for Development) has made it clear that conventional, industrial agricultural systems have degraded the environment to such an extent that “business as usual is not an option”. A new approach to agriculture is required which combines enhanced productivity with improved resilience of the natural environment.
9. The UK Government’s response to the food supplies debate must clearly distinguish, and be informed by, the short, medium and long-term realities. In the short-term, the world is not running out of food: the UN Food and Agriculture Organisation states that the average adult requires 2500 calories (kcal) per day. Current global food availability stands at around 2800 kcal per person and is projected to rise to 3050 kcal by 2030. Therefore, current global food production would be sufficient to feed everyone in the world, even with increasing population and consumption, at least until 2030.
10. The short to medium-term priority must be to prepare for increased demand which is produced in a sustainable way. In the longer-term, farming systems around the world must be adapted to produce sustainable, safe and adequate quantities of food that are not dependant on diminishing oil supplies and can respond to the challenges of climate change as well as protecting wildlife, water and soils.
11. Current rates of UK self-sufficiency are high (60% in all foods and 74% for foods that can be produced domestically). The UK has exceeded these rates only once in the last century, peaking, in the 1980s at almost 80% and over 90% respectively. This heightened production, driven by subsidies and market measures within the Common Agricultural Policy (CAP), facilitated a suite of negative impacts:
  - (i) Market distorting dumping of EU surpluses on international markets, which helped to suppress the development of food production in developing countries;
  - (ii) Inflated food prices for consumers; and
  - (iii) Further intensification of agricultural production systems (e.g. increased fertiliser and pesticide applications, simplified landscapes) with negative environmental impacts (e.g. loss of natural and semi-natural habitats, increased greenhouse gas emissions, degraded water quality).
12. Following recognition of these impacts, the CAP has substantially changed. A series of reforms have removed the incentive to over produce and land-managers in receipt of direct payments must respect baseline environmental standards (cross-compliance). Pillar 2 of the CAP has also been established which provides financial support to farmers undertaking measures to positively manage land for environmental benefit.

13. These changes were informed by the growing realisation that maximising production, well in excess of the natural carrying capacity of the land and reliant on high levels of chemical input, was degrading its environmental quality and putting at risk its productive capability. Although positive, these reforms are still framed within a “business as usual” approach which does not adequately reduce the current system’s contribution to environmental degradation or plan for the necessary changes to farming which will arise from changing climatic conditions in the coming decades.

14. The Government has recognised that “*Bird populations are considered to be a good indicator of the broad state of wildlife and the countryside*“. Farmland bird populations (the Farmland Bird Index—FBI) have declined sharply in the era of industrial agriculture, and numbers continue to fall.

15. Agriculture and conservation are not incompatible and it is possible to design systems that are both productive and benefit the environment. Measures taken at the RSPB’s Hope Farm in Cambridgeshire, such as skylark plots, have a negligible effect on crop yields, whilst massively boosting bird numbers. Overall, the farm’s FBI has more than doubled against a background of national decline, with no impact on crop yields. Within a context of heightened concern over global food supplies Defra should be commended for developing a set-aside mitigation measure, which will combine productive agriculture with biodiversity benefit.

16. Although the UK will need to increase food production over the coming decades it is vital to acknowledge that individually, we cannot contribute significantly to doubling global food supplies by 2050. Ortiz *et al*<sup>139</sup> argue that, in order to accommodate a growing global population, average global wheat yields will need to increase over the next 25 years from 2.6 to 3.5 tonnes per hectare. In 2007, average wheat yields in the UK were 7.2 tonnes per ha. Increasing this already exceptional efficiency may still be achievable but the productive capacity of the UK is tiny in global terms: the UK holds only 0.34% of the world’s agricultural land and is responsible for 0.8% of global cereal production.

17. Domestically, it is essential that the UK continue to grow food, both to secure local supplies and to play a role as part of a stable global economy. However, there is little rationale for immediately pursuing maximum production levels and disregarding the other roles agricultural land performs, as the net impact on food supplies would be negligible and the environmental consequences dire. Food security is also about more than just the levels of food grown. Every year, UK households waste 6.7 million tonnes of food, a third of the total bought. 61% of this waste is avoidable and could have been eaten if it had been managed better. A simple way to contribute to available food supplies is to address unsustainable levels of waste.

18. Globally, the priority for improving food supplies must be to help developing countries increase their own productive capabilities through supporting research and development into ways to sustainably increase yields and reduce post-harvest waste.

19. The RSPB believes that policy-makers around the world must better recognise that food production systems and the environment are not mutually incompatible but rather inter-dependant and key to attaining genuine food security. The UK has a key role in leading the development of low carbon, productive systems with high environmental standards that increasing proportions of the world’s temperate agricultural regions will need to adopt in the future.

### *Supply side challenges faced by the UK*

#### *Soil quality*

20. Intensive crop cultivation has been made possible through the application of significant quantities of pesticides and artificial fertiliser, both associated with ecosystem disruption, water pollution and rising greenhouse gas emissions. Inversion tillage and drainage have reduced the amount of organic matter left within many soils in the UK. This has reduced both its natural productivity and stability, in turn leaving it more vulnerable to erosion.

21. Soil loss, whether through erosion or degraded quality has the potential to significantly affect our capacity to grow food in the future. Modern cultivation methods, including larger field sizes, have led to agriculture being responsible for 95% of the 2.3 million tonnes of soil lost in the UK between 1995–1998. Intensive irrigation can also lead to soil salinisation, which interferes with plant growth, is a major contributor to desertification and affects an estimated 1–3 million hectares across the EU. In the EU, Spain is particularly affected but the problem is starting to emerge in East Anglia.

22. The RSPB believes the content, stability and quality of soil must be improved if the UK’s productive capacity is to be maintained. A stable and healthy soil bank becomes especially important if we look ahead to farming systems which will need to rely less on greenhouse gas emitting fertilizers and changeable water availability.

<sup>139</sup> Ortiz *et al*. Climate Change: Can wheat beat the heat? Agriculture, Ecosystems & Environment 126 (2008) 45–58.

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*Water availability*

23. According to the Environment Agency:<sup>140</sup>

*“Farmers use less than 1% of the total amount of water abstracted in England and Wales for spray irrigation. The biggest demand for spray irrigation is in East Anglia, where abstraction can average 20% of the total for all uses over a typical summer (when water resources are most scarce). Sometimes more water is used on a hot dry day for spray irrigation than for public water supply. Nearly all the water used for spray irrigation is used by crops or lost by evaporation and can therefore have a much greater impact on the environment compared to other forms of abstraction where water is returned after it has been used.”*

24. The demand for irrigation is likely to increase with climate change, just as the resources available are likely to decline. The south east of England is already considered to be under severe water stress.

25. Even if Government targets for increased water efficiency are met, population growth and demographic shifts to the southeast will place new demands on water resources.

26. The farming industry can make water go further with improved irrigation scheduling and technology and developing on-farm reservoirs etc. However there is no doubt that water availability will limit the quality, quantity and type of produce grown in England and may also affect the quality of our soils.

27. The issue of water quality must also be considered: the UN Millennium Ecosystem Assessment has identified eutrophication, the pollution of watercourses by plant nutrients, as one of the three most serious threats to biodiversity and ecosystem function alongside climate change and habitat loss. In 2002, it was estimated that agriculture was responsible for around half of the phosphorous and 70% of the nitrogen entering water in England. As future farming systems must be able to maintain productivity, it is vital that valuable plant nutrients are not allowed to escape into the wider environment, where their ability to boost crop production is lost and harm is caused to the natural environment.

28. Environmental stresses produced by unsustainable water use in agriculture will be exacerbated by climate change. Practical and effective solutions must therefore be developed as part of the development of farming systems with reduced environmental footprints.

*The marine environment*

29. In 2007, Defra produced “*Fisheries 2027—a long-term vision for sustainable fisheries*” which aspires to a scenario in which stocks are “plentiful and sustainably harvested”, and to catch levels which optimise long-term economic benefits and ensure stocks are not over-exploited. As fishing is a trans-boundary activity, the capacity of the UK to contribute to growing food demands should be viewed under the aegis of the Common Fisheries Policy (CFP).

30. The main objectives of the CFP are to “*ensure exploitation of living aquatic resources that provides sustainable economic, environmental and social conditions*”. These objectives are far from being achieved, with productivity at best running to standstill, and arguably declining. Currently 30% of fish stocks for which sufficient information exists are outside safe biological limits, which means that recruitment levels to the adult stock cannot guarantee future sustainability. 80% of Community stocks are fished so intensely—above maximum sustainable yield (MSY)—that yield is reduced.

31. Against this background, the UK’s fortunes are inextricably linked to those of other European fleets, whose fishing capacity the Commission currently estimates to be 40% in excess of that needed to balance exploitation with available resources. Much will depend on the success of the 2012 reform of the CFP in finding measures to reduce fishing effort substantially, otherwise doubling fish landings by 2050 is a vastly unrealistic aspiration.

32. This forward projection also needs to take account of several related factors: (1) the increasing (and uncertain) impact of climate change on fish stocks (Defra’s 2007 vision already acknowledges that “*Climate change has altered the abundance and distribution of fish stocks in EU waters*”). (2) Increasing pressures on fishing space from other human activities in our waters, notably from renewable energy developments. Both of these trends are likely to make it harder to achieve the productivity increases sought, and at the very least adds to uncertainty. (3) The increasing onus to take an ecosystem-based approach to fisheries management (which some regard as a constraint on traditional fishing practices).

33. The number of fish stocks subject to abundance assessment in UK waters has also declined markedly in recent years and this needs to be rectified, otherwise we cannot judge what level of exploitation they can sustain.

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<sup>140</sup> Environment Agency (2008) Water resources in England and Wales- current state and future pressures.

*The science base*

34. Agricultural research and development is necessary in order to determine how, and if, crop yields can be improved. However, investment in has been reducing steadily in recent decades, along with a shift from public to private sector investment in developed countries. In the UK, there was 45% decrease in funding for MAFF (Ministry of Agriculture, Fisheries and Food) between 1986 and 1998. The decline in public investment in agricultural research and development has mirrored a fall in the rate of productivity gains.

35. Research and development is vital if the UK is to maintain food production and adapt to future climate challenges. However, as the IAASTD report highlights, current forms of industrial agriculture are unsustainable, and will become increasingly impractical as climate change impacts begin to manifest.

36. Instead of trying to adjust the current system to improve yields, governments must commission research which takes a broader, system-level approach. The recent announcement by Defra to direct £4.3 million to bee disease and surveillance research is an encouraging indication that the value of biodiversity to food security is being recognised (pollination services provide by bees are estimated to be worth €153 billion each year but global bee populations are in steep decline).

37. Through the SAFFIE project (Sustainable Arable Farming For an Improved Environment), the RSPB worked with partners to demonstrate practical ways of combining productive agriculture with positive biodiversity delivery. Since Hope Farm was brought under RSPB control in 2000, farmland bird numbers have increased by 119%, against a backdrop of national decline. This has been achieved in parallel with exceptional cereal yields, which reached a record 11.69 tonnes per hectare for 1st wheat in 2008. This demonstrates that it is possible to manage modern farms to yield both food and environmental goods.

38. Within this broader framework, The RSPB believes the development of new technologies, must be governed by the following key principles:

- (i) The health of biodiversity and the natural environment is integral to securing and maintaining productive increases.
- (ii) Any novel technology must be fully assessed for its environmental, social and economic impacts before being approved for cultivation.

*Trade barriers*

39. Trade barriers, used in 2008 when key food producing countries imposed export bans and tariffs to buffer their consumers from global price increases, both intensified price fluctuations and restricted food availability in certain parts of the world. When operating as it should, international trade is important for national food security as it provides a means of spreading risk.

40. The current trading system has however failed to internalise the environmental costs associated with industrial agricultural systems.

41. Trade rules must not prohibit or limit measures taken by governments to correct the market's failure to value the environment (via WTO Green-box proof agri-environment schemes for instance) or to meet domestic or multilateral environmental commitments.

*The way in which land is farmed and managed*

42. Farmers, responding to economic signals, can be relied upon to produce the types and quantities of food that the market demands. The role of government must be to remove obstacles to this process (e.g. market distorting production related subsidies). It is not the role of government to set or support specific levels of production, this should be determined by a country's natural (i.e. productive) and competitive (i.e. food quality and safety) advantages.

43. There is however, a role for government to reward the environmental outputs from farming which are not recognised by the market. In 2005, Defra and HM Treasury produced a joint paper entitled "*A vision for the Common Agricultural Policy*". This vision sets out clearly that sustainable agriculture should be "*rewarded by the market for its outputs, not least safe and good quality food, and by the taxpayer only for producing societal benefits that the market cannot deliver.*"

44. The RSPB believes the Government must proactively take this "public money for public goods" vision forward at the European level, taking full advantage of the forthcoming EU Budget review as an opportunity to spotlight the need for a new focus. When this has been established, new market mechanisms or techniques (which may build upon current cross-compliance rules and agri-environment schemes) should be developed, along with an adequate budget allocation, to facilitate the move towards a new, sustainable system of land management in the UK.

*Demand side trends*

45. Global demand for meat and dairy is projected to double by 2050, with developing nations' consumption patterns moving closer to that of the UK. The environmental impacts of livestock production are significant, both in terms of land-use change (such as habitat loss to create cattle grazing), greenhouse gas emissions and the diversion of cereals for feed.

46. These projected levels are unlikely to be sustainable but without government intervention, patterns are not likely to change. The RSPB believes that full life-cycle analyses should be undertaken for all production systems to determine their environmental impacts. This should then be used to develop mechanisms that encourage more sustainable consumption patterns. Support for equivalent government action in developing nations such as China and India, must also be provided otherwise the global impact of action within the UK will be extremely limited.

47. Local food networks have real potential for both establishing more sustainable production systems and re-connecting consumers with agriculture. However, such networks should not be encouraged at the expense of wider trading systems which provide a cushion against local crop failures/extreme weather events etc.

## ACTION TO MEET CHALLENGES

*The role of Defra*

48. To address the weaknesses highlighted in this response and to capture the strengths, Defra must drive the CAP reform process at the EU level and lead the development of environmentally sensitive production systems.

*Leadership and assistance from Defra*

49. Within the context of secure food supplies, the key role for Defra must be to continue to support and develop sustainable production techniques. Agri-environment schemes are extremely important as they provide an incentive for farmers to view the management of their land in both environmental and commodity terms. Although there is significant scope for scheme improvement, it is vital the Government continues to place an emphasis on agri-environment measures.

50. In terms of the UK food industry, consumer interest in the "environmental footprint" of food is growing and many retailers are accessing this by developing marques or brands which highlight the "sustainability" benefits of certain products (such as Freedom Food, Leaf Marque, Fair-trade). The RSPB welcomes the development of mechanisms that enable farmers to access a premium price for a production method that supports the delivery of ecosystem services. However, there is significant scope for the retail and food sector, crucially regulated by government, to better regulate marketing to avoid misleading messages (e.g. implying a product is "greener" than it is) and to strengthen existing standards.

*Engagement across Government and internationally on food policy and the regulatory framework*

51. The principle cross-department issue with potentially significant impacts on food supplies is biofuels, in particular the impacts of governmental targets on land use. Biofuels should not be grown on land currently used for food production or on land which is important as a carbon store or for biodiversity.

52. At present, the tools required to properly address the adverse impacts of UK and EU biofuels policy have not been developed and the only logical response is to stop setting targets in this area. The Government's response to merely slow down the rate of increase in the Renewable Transport Fuel Obligation (RTFO) will still lead to adverse impacts on land use, greenhouse gas emissions, biodiversity and food security.

53. It is essential that Defra is fully engaged in policy debates and decision-making on biofuels, biomass and other areas that impact on agriculture, forestry and land use.

54. The recent establishment of Defra's Council of Food Policy Advisors has significant potential to contribute to the food supplies debate. As the Council's remit includes assessing how increased production can be achieved while maintaining climate change goals and targets, the opportunity should be taken to investigate sustainable production systems that deliver multiple benefits.

*RSPB*

*January 2009*



## Memorandum submitted by the National Institute of Agricultural Botany (NIAB) (SFS 61)

NIAB's expertise is in plant genetics, plant breeding and the services, staff and infrastructure required to deliver improved crop varieties and seeds to farmers. Our submission therefore focuses on these areas.

### EXECUTIVE SUMMARY

1. The challenge for 21st century agriculture is to double food production over the next 40 years, on a finite amount of land and using increasingly scarce and costly resources. Advances in plant breeding will be the single biggest factor in meeting this increased demand, and significant opportunities exist—using both conventional and transgenic approaches—to boost crop productivity.

2. Exploiting these opportunities, however, will require a step-change in public sector investment in the translational research and infrastructure needed to support innovative plant breeding for public benefit.

3. The UK has progressively cut public sector investment in applied agricultural research and knowledge transfer in favour of a market-based approach. But it is clear that the income from commercial plant breeding—through royalty payments on seed—is not enough to support a more speculative, long-term approach to R&D.

4. The pipeline from research has now narrowed to a precarious level. While our research institutes and universities remain world-leaders in basic plant science, much of that work is taking place in model crop species without being transferred to potentially useful crops.

5. Working in partnership with these plant science organisations, NIAB has the unique scientific skills and agricultural expertise to translate advances in basic plant science into genetic backgrounds and material which will be of use to commercial plant breeders.

*Q1. How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

6. Global demand for food is beginning to outstrip supply, and with limited land available to bring into agricultural production, the only viable option to feed a rapidly increasing world population will be through productivity growth—producing more output per hectare.

7. Furthermore, climate experts predict that the world's agricultural production will become increasingly dependent on temperate regions such as Europe and North America as climate change affects crop yields and water availability in sub-tropical regions.

8. The UK in particular benefits from good quality soils and a favourable climate for consistent, high-yielding crop production. On the whole, UK farmers are technologically aware and quick to adopt new innovations.

9. Crop improvement through plant breeding will be the major contributor to increased crop productivity for the indefinite future. Interim findings of a recent study by NIAB suggest that between 1947 and 1982, around half the yield gain of major UK arable crops such as wheat and barley could be attributed to plant breeding, shared equally with the contribution of other factors such as improved agronomy, machinery and inputs. Since 1982, the contribution of plant breeding to yield gain has increased to more than 90%.

10. There is scope to deliver continued incremental improvements in plant breeding, for example through double haploid production, improved understanding of genotype x environment interactions, and more routine use of marker-assisted selection to reduce the breeding cycle time.

11. Advances in our basic knowledge of plant genetics are also opening up major opportunities for radical, dimension-changing developments in plant breeding. Improved understanding of the photosynthetic process, for example, could allow conversion of C3 crop species such as wheat and rice into more productive C4 crops such as maize. The development of apomictic crops—allowing asexual reproduction through seed—would enable desirable traits to be maintained year after year, with no loss of hybrid vigour. The introduction of perennial cereal crops would result in reduced inputs—e.g. no ploughing—and other environmental benefits.

12. Exploiting these opportunities, however, requires a fundamental shift in research funding (see response to Q2, below).

*Q2. In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system?*

*The science base*

13. There are clear indications that the annual rate of yield improvement in the major UK arable crops has slowed in recent decades. For example, the annual increase in average UK cereal yields has fallen from around 4% in the 1980s to less than 1% today. This decline in UK agricultural productivity can be directly linked to a progressive withdrawal, since the mid-1980s, of public sector investment in applied agricultural science and technology transfer.

14. The need to reverse this chronic under-spending in applied UK research for crop improvement was identified in a major BBSRC review of UK crop science in 2004 led by Professor Chris Gilligan of Cambridge University. This review confirmed the strength of the UK's fundamental science-base, but also identified weaknesses in the translation of basic genetic discoveries into improved crop varieties of practical relevance and application for farmers and growers.

15. Professor Gilligan's review highlighted an urgent need to strengthen the delivery pipeline to take the findings of underpinning research—mostly conducted in model crop species—through to practical application by plant breeders.

16. Measures put in place since Professor Gilligan's review—including support for the establishment of Crop Genetic Improvement Networks, and projects supported under the BBSRC's £13 million Crop Science Initiative—have helped strengthen links between public research and commercial plant breeding sectors. In addition, there is increased recognition in funding priorities for public sector research of the need to validate and transfer gene discovery to practical application. However, lack of public sector support for essential translation activities—particularly pre-breeding—remains a major block to the delivery of step-change innovation in the main UK arable crops.

17. The fixed nature of plant breeders' income through seed royalties seriously limits investment in more speculative or long-term approaches to breeding and trait selection—and so prevents the practical application of major advances taking place in gene discovery.

18. Total royalty income to UK plant breeders across all crops is in the order of £30 million per year, of which perhaps 2% (£600,000 p.a.) might be available for speculative research. In the context of commercial plant breeding, it is clear that a market-based approach to funding near-market or applied agricultural research is not working because the market is simply not big enough.

19. The widening gap between our basic understanding of plant genetics and our ability to apply that knowledge in practice presents a compelling case for public sector funding to bridge the gap.

20. As a demonstration of what can be done, NIAB through its strategic alliance with the John Innes Centre and in partnership with other research institutes (Rothamsted, IBERS) and Universities—is re-connecting the R&D pipeline by providing a dedicated pre-breeding platform capable of translating basic genetic discoveries into materials suitable for use in commercial wheat breeding programmes.

21. This innovative programme will provide a delivery mechanism allowing novel traits and associated marker technologies to flow from publicly funded research through to exploitation in commercial breeding. Trait genes and markers will be validated and assessed in pre-competitive germplasm, adapted to UK conditions, and made available for use by commercial breeders and other research organisations.

22. NIAB has already made significant progress towards that goal, with a £1.25 million investment in laboratory facilities, equipment and growth rooms at its Cambridge site. Over the past two years, a team of more than 30 highly-skilled scientific staff, including three plant breeders, has been recruited.

23. The building blocks are in place, and already NIAB has secured a number of short-term research contracts—both independently and with other research partners—which serve to illustrate the pre-breeding skills and capability on offer. But plant breeding is a long-term process—the challenge now is to establish a secure funding base which will safeguard the future of the centre and the team behind it as a vital resource in support of plant breeding for the public benefit, focused on the following strategic objectives:

- Low-input farming and climate-proofing traits.
- Improved human and animal nutrition.
- Durable disease and pest resistance.
- Plant-derived industrial products.

*The provision of training*

24. There are widespread concerns within the agricultural research sector over the lack of new blood coming through to succeed a generation of applied agricultural scientists now reaching retirement. There is a strong view that researcher career paths—and project funding priorities—have in recent decades been driven and rewarded more by scientific publications than by practical research impact.

25. As a training organisation, NIAB provides a range of courses across virtually all aspects of crop production—from seed sampling, testing and inspection through to the latest methods in plant breeding and quantitative genetics. The practical focus of NIAB’s role as a training organisation is now virtually unique among UK plant research institutes, yet the need to strengthen links between research and productive agriculture is viewed as essential to meet future policy objectives.

26. The establishment of a pre-breeding initiative presents a significant opportunity to provide genuine career opportunities for applied plant scientists motivated less by “high science” publications than by delivering practical impact and innovation on the ground.

Q3. *What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

27. Today, Governments around the world are introducing new laws and financial support to address and mitigate the effects of severe economic conditions.

28. Tomorrow’s crises will be in food, energy and water supplies. Given the right signals and the necessary support, the UK science base is well-placed to respond, but the UK Government must act now to invest in crop science, plant breeding and knowledge transfer.

29. There appears to be increased recognition within Defra of the importance of food security, and the role of productive agriculture in addressing future food needs. The recent establishment of a Council of Food Policy Advisors is a welcome development, and the Secretary of State’s recent speech to the Oxford Farming Conference highlighted the importance of maximising UK-based food production, and the vital role of science—and plant breeding in particular—in meeting that objective. These words must now be backed up by positive action.

January 2009

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### Memorandum submitted by Food Security Ltd (SFS 62)

*Response to EFRA Committee Enquiry “Securing food supplies up to 2050: the challenges for the UK”*

1. The call for such a massive increase in food production by the UN Food and Agriculture Organisation is an extremely serious challenge. It is reported in the *Farmers Weekly* (9 January 2009) that the Council of Food Policy Advisors has been instructed not to recommend any measures that would increase domestic food production. This is a strange but certainly not unexpected state of affairs. Defra is adamant that food security is global, yet refuses to take up its responsibility to play its part in increasing production.

2. Climatic conditions for food production up to 2050 are likely to be far more favourable than in many other countries. However, if the Government has any intention of responding to the call to increase food production, the following policies will have to be seriously reconsidered:

- The oft-stated intention to cut the yield-enhancing fertiliser usage nitrogen, when already the nitrate levels in many rivers is falling.
- Removal of tax relief for farm buildings, especially crippling for those already built in expectation of ABAs, giving farmers a further unwanted feeling.
- The smug feeling that we will be OK now that we are in Europe.
- The determination to raise revenue from farmers via compulsory registration for dealing with exotic diseases.

3. In order to increase food production, an impact assessment of the Government’s policy to “Scrap the CAP” should be undertaken. The following questions should be asked:

- The average UK farm income without any form of Government support would have been about £25 a week in 2007 (*Farmers Weekly* 8 February 2008), and farmers’ borrowing is at an all-time high—showing how effective Government policies for farmers to be “keepers of the countryside” rather than producers of food have been. If SFPs or equivalent had been finished with ten years ago, who knows how many farmers would have been left by now?
- How much less tax would the Inland Revenue be collecting?
- How much will our inevitably-increased dependence on food imports, at a time when the pound is rapidly declining in value, increase a family’s shopping bill? Also, how high would that bill have been by now?

4. The current UK food system is strong in that our agriculture is of the highest standard. However, its strength cannot be sustainable unless farmers receive a fair price for their produce. In the face of continual uncertainty and financial loss, it will continue to decline. If Defra does not take measure to force buyers to treat their suppliers fairly, who will? Other major issues have had to be faced by earlier governments—slavery, child labour, for example. Why should the present Government not follow suit?

5. The question raised about how well Defra engages with other relevant Government Departments is very potent. We would like to draw the Committee's attention to the recent article by the Royal United Services Institute, "Risk, Threat and Security", in which they say "We need to remind ourselves of the first principles which govern priorities in the liberal arena of short-term party politics". Defence and security must be restored as the first duty of government. Moves are needed to take defence and security, as far as possible, back out of democracies. They make proposals "that would help both ministers and officials comprehend the inter-related nature of today's risks and the emergence of threats". How can defence be even considered without reference to the food supply? This is common sense to the simplest of individuals—maybe there is some hidden reason why politicians adamantly refuse to see it. Their antipathy to English farming seems to be distorting their judgement to the point of endangering the nation, as well as damaging our economy and therefore everybody's bank balance.

6. Some Government advisors claim that we are no longer an island, but part of a trading block. We would like to raise the question, have any signed and dependable treaties been put in place which would be honoured in the event of our trading routes being disrupted or our imports drying up for any reason? How can we be sure that France, Germany, Denmark, Holland, etc. would feed us if they needed their own supplies for their own people, or in the event of international crisis? These nations have not been inclined to come to our aid over the years—some certainly do not pull their weight in Afghanistan. Do we really want the humiliation of having to call on America and Australia again? We spoke to the Australian Ambassador when he was at Westminster a while ago, and he assured us that they would help us if necessary, but why should we allow such a terrible situation to develop again, where we expect these countries to sacrifice their men, ships and planes on our behalf? We were ashamed as we spoke to him. Have we forgotten the suddenness of Russia's recent invasion of Georgia? We certainly worried at the time as to what the consequences might be worldwide. No doubt the Committee members are aware that, while the EU is busy regulating on pesticides and nitrogen, Russia is busy with a massive re-armament programme, costing some \$183 billion dollars (see House of Commons debate, "Defence in the World", 1 February 2007).

7. The present economic crisis may well prove impossible to solve until attention is paid to agriculture—the primary industry which is the foundation and mainstay of the economy. Has this not been proved in Zimbabwe?

Food Security Ltd

January 2009

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### Memorandum submitted by Syngenta (SFS 64)

#### 1. INTRODUCTION

1.1 Syngenta is a world-leading agribusiness committed to sustainable agriculture. The company's innovative research and technology helps maximise food, fibre and bio-fuels production whilst protecting the environment. The company is a leader in crop protection and ranks third in the global commercial seeds market with sales of \$8.1 billion in 2006. Syngenta employs 21,500 people in over 90 countries.

1.2 Syngenta has a strong UK heritage, operating here for nearly 100 years. We are one of the country's top 35 biggest investors in research and development (R&D) as evidenced by the Department for Innovation, Universities and Skills and Department for Business, Enterprise and Regulatory Reform's 2008 R&D Scoreboard, which also places Syngenta as the top chemicals investor in the UK.

1.3 We also contribute over \$1 billion of value to UK exports and have the largest dedicated agricultural research centre in Europe, based at Jealott's Hill in Berkshire, where we employ over 500 scientists, including many world leading chemists, biologists and environmental scientists. Syngenta spends \$200 million a year on agricultural research in the UK and \$800 million globally, in an industry where it can take 10 years and up to \$280 million worth of investment to bring a new product to market.

1.4 Given our role supporting primary producers in the UK and around the world, we welcome the opportunity to respond to the Environment, Food and Rural Affairs Select Committee inquiry, *Securing food supplies up to 2050: the challenge for the UK*, and hope that our response is a useful and informative contribution.

2. SYNGENTA POSITION

*The challenge*

2.1 At present UK consumers have a reliable and consistent set of quality and healthy food choices available to them. Much food is produced domestically. However the UK food supply is also tied to a complex global system of food production and distribution, the overall stability and security of which is dependent on variables ranging from global weather patterns to international politics. Systemic pressures during 2008—both environmental and political—caused the price of some food commodities in the global market to increase sharply. Such volatility raises questions about the robustness of the global food supply system in the face of rapid population growth, increasing water scarcity and a limited availability of agricultural land.

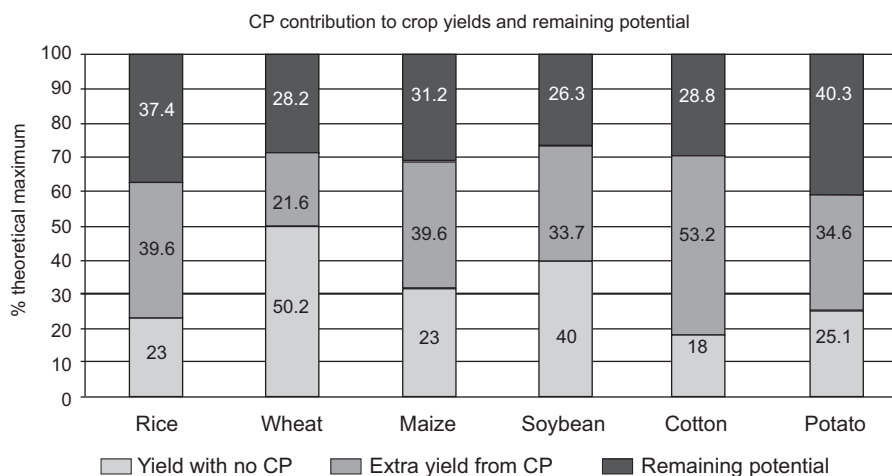
2.2 Although the UK has an advanced and well developed agricultural sector and we are well positioned to grow significant amounts of food for domestic consumption it would be difficult, and not particularly desirable to consumers, to achieve national food security by working towards self-sufficiency. Certainly UK domestic food production should be supported and encouraged, but the overall security of the UK food supply will to some extent remain dependent on the outcomes of agricultural production elsewhere in the world.

2.3 The challenge for the UK is to play its part in a sustainable agricultural system in Europe which maximises production through increases in yield, whilst minimising the environmental impact.

*The potential of technology*

2.4 Successful agriculture is reliant on safe and effective inputs. Accordingly, it is our view that agrochemical and biotechnology products have a significant and important role to play in ensuring global agriculture fulfils its potential. Seed- and crop-protection products provide farmers, at home and abroad, with a proven range of tools that enable them to deliver consistent and reliable supplies of quality raw materials to global food markets. Our products have helped increase yields by safeguarding crops and maximising the use of finite and scarce resources such as land and water—a dual benefit.

2.5 It is worth referencing the table below to get an understanding of the benefit crop protection products (CP) can deliver:



Source: Crop losses to Pests, E-C Oerie, Journal of Agricultural Science (2000), 144,31-43

2.6 Evidence shows that technology works in agriculture. In the United States, farmers have clearly demonstrated the value of technology, not only through the use of seed- and crop-protection products but also through the application of modern advanced farming practices. It is this combination of new technologies and innovative approaches that has produced results. Whilst we recognise that farming methods do and should vary around the world the example of the United States highlights that agriculture need not be a static process where innovation and progress are automatically rejected on the basis that they bring something new.

*The current situation*

2.7 By embracing technological innovation globally, agriculture could deliver a range of environmental and economic benefits. The current negative attitude of many within Europe towards technology and science in agriculture means that farmers in Europe may be denied access to a full set of tools with which to aid productivity and play a part in securing global food supplies. The EU’s recent decision to limit pesticide use is a good example of how important decisions relating to food security can be made with little understanding

of either scientific evidence or potential impact. The slow and cumbersome EU approval process for GM crops and products is also placing significant pressures on farmers in Europe. Such developments highlight the need for the UK and other enlightened member states to present a better and more forceful case politically in Europe if food security is not to be undermined by perhaps well intentioned but ultimately counter-productive political intervention.

2.8 The position in Europe also sends a signal to the international community that the application of technology in agriculture is to be avoided where possible—despite products being deemed safe by regulators. Europe risks seriously undermining the productivity of its own farmers by adopting the position it has. Its approach may also have a significant bearing on the approaches of governments and regulators in countries where farmers, particularly in less developed countries, have little chance of being fully productive without the helping hand of technology. To counter this view the UK should clarify its own position, making clear to foreign governments where possible that it supports the use of technology in global agriculture as an essential input.

#### *How the UK government should respond*

2.9 The UK government has a leadership role to play if it is serious about working to secure food supplies at home and abroad. There would be a double edged benefit for the UK in showing such leadership. The development of solutions and products in the UK—at sites such as Jealott's Hill—can both play an important role in addressing fundamental concerns around food security whilst also capitalising on home grown scientific expertise in this area.

2.10 Based on these comments there are a number of key conclusions and recommendations that we wish to set out to the committee:

- Defra in conjunction with FCO and DfID should look to proactively voice support in European and international bodies for agricultural technologies that help farmers safeguard and increase agricultural production thereby helping to secure global food supplies without further increasing environmental impact.
- Defra should look to promote the principle in Europe that the regulation of agrochemical and agricultural biotechnology products should be undertaken on a risk rather than hazard basis and promote a requirement for an EU-wide impact assessments as part any new proposals in this area.
- Defra and the FSA, as the UK representatives on agricultural, food and feed issues, should vote positively in the GM approvals process in the EU where evidence from the relevant independent scientific bodies indicates that products are safe for human and animal health and the environment.
- Defra should look to encourage the European Commission to continue its Sherpa initiative on member state voting relating to GM.
- Defra should actively discourage the inclusion of socio-economic considerations as part of a science based approval process.
- Defra should find ways to encourage and protect GM trials in the UK.

### 3. RESPONSE TO QUESTIONS

3.1 We have approached the committee's questions within the context of our position statement and the associated recommendations. We would be delighted to offer more insight and information to the committee either through oral evidence or meeting individually with those members of the committee who would like to understand more about the work we do.

#### *How robust is the current UK food system? What are its main strengths and weaknesses?*

##### *Strengths*

3.2 The current UK food system is robust, in part because we can grow a reasonable amount of our own food domestically. The experience and calibre of farmers in the UK also provides a safeguard against some of the external pressures. At the processing, manufacturing, distribution and retail levels the system is generally able to deliver high volumes of safe, quality food to market at affordable prices.

3.3 Although the picture in terms of consumer acceptance of technologies such as GM remains unclear, we feel that in general there is an acceptance that technological inputs such as pesticides play a role in helping to secure the production of safe, low cost food in the UK. We see such consumer acceptance as a strength to the system overall and one that the government and regulators should work to maintain and develop where possible.

### *Weaknesses*

3.4 As we have set out in our position statement the UK is in part integrated in a global food supply, which means that it is inherently impacted by pressures in the wider system. This will always be a point of potential weakness. Again as we have outlined above we believe that crop protection and other agricultural technologies will continue to play a valuable role in stabilising production and securing supply in the UK and beyond.

3.5 On the consumer side we also believe that the overall system is weakened by poor consumer understanding of the food system generally and the application of technology and new approaches specifically. It is important to debunk the myths associated with modern farming practices if the system is to develop and implement new approaches that will help strengthen the system and secure food supplies.

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

#### *Soil quality*

3.6 Maintaining healthy soils is crucial for productive agriculture be it in the UK or further afield. But soil is constantly under threat from erosion, salinisation, loss of organic matter, desertification, and “soil ceiling” driven by the expansion of urban areas. Unless soils are protected, the productivity of the world’s crops will be impaired, yields will drop, and we will be unable to meet the dietary needs of a growing population.

3.7 Conservation/minimum tillage farming helps to conserve soil structure by leaving roots intact, helping to prevent soil erosion. There are benefits for farmers and their families arising from a reduction in the need for constant hand-weeding, while cutting the costs and carbon emissions associated with mechanised tilling. Technology has a role to play here. Syngenta is involved in several multi-stakeholder projects across the world to promote soil conservation. You can find out more about this work here—<http://www.sowap.org/comms/media/pdf/conservationagriculture.pdf>.

#### *Water availability.*

3.8 Agriculture consumes the vast majority of water taken from rivers, lakes and aquifers, accounting for up to 70% of global water use. Access to water is therefore crucial for agricultural productivity and yet one third of world agriculture is either in or close to areas considered to be water scarce.

3.9 Given the trends identified by climate change experts, it is essential that agriculture find ways to sustain its water supply and use the resource as efficiently as possible. Many companies, including Syngenta, are field testing crops developed through native traits breeding and also working to develop genetically modified crops that are able to continue to yield under severe water stress; this is as relevant to farmers in East Anglia as it is in East Africa.

#### *The science base*

3.10 We believe that it is important for the UK to continue to play a role in developing and strengthening its science base, particularly in areas relating to primary production. Syngenta are the only major company in the agricultural technology sector who continue to maintain a large scale R&D facility in the UK with our campus at Jealott’s Hill, Berkshire. Some of the world’s most advanced research into the development of pesticides, new breeding methods, and agricultural processes takes place at this site.

3.11 But it is clear that the current political environment in Europe makes justifying continued investment in technologies such as GM unsustainable. Syngenta reluctantly moved its GM research facility from Jealott’s Hill to North Carolina in the United States in 2004. This was in part due to the limited commercial opportunity for the technology in Europe but the decision was also influenced by the adverse political climate. It will be hard for the UK to maintain genuine global leadership in regard to agricultural technology if it fails to train and develop scientists who hold expertise in GM technologies. This is a highly desirable area of research for many of the UK’s best chemists and biologists and they will increasingly look to go abroad to train and develop research if the opportunities do not exist at home.

#### *Trade barriers*

3.12 The lack of acceptance of GM crops within Europe represents an increasingly frustrating trade barrier that has a direct impact on food security. Failure to acknowledge the role GM crops can play means that UK farmers do not have access to the best possible tools, whilst the UK’s imports of non-GM crops become increasingly expensive as emerging markets provide an expanding market for GM growers in North and South America.

3.13 For over a decade now, farmers have used GM Crop technology to improve productivity by both protecting and increasing yields, particularly through virus and insect resistant plants. Genetically modified crops are already helping over 12 million farmers around the world, including many farmers in the EU, by delivering more consistent yields of higher quality crops. The vast majority are resource-poor growers with small plots of land whose lives can be significantly improved through GM technology.

3.14 Today, companies like Syngenta, are engaged in the research and development of the next generation of GM Crops, which will be targeted at overcoming the challenges facing agriculture.

*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

3.15 Food production needs to be responsive to consumer demands. Although consumers are often keen to try new—perhaps novel—food products we feel that core products that deliver balanced diet will continue to be fundamental. Fresh fruit, vegetables and cereals will continue to underpin the diets of most consumers, delivering nutrition and associated health benefits.

3.16 There is a role for local food networks—but we would warn against suggestions that these networks could completely replace the large scale processing, distribution and retail networks that currently deliver high quality food and choice for all consumers.

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

3.17 As we have outlined in our position statement and recommendations we believe that Defra has a significant role to play in promoting the use of technology to strength food production processes in the UK and beyond.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

3.18 The recent changes to Defra have ensured that the department is now better focused on its remit to safeguard and strengthen the UK food supply chain. This can only be positive.

3.19 Although Defra is already quite active in terms of its engagement across Government and external organisations as we have set out in our recommendations we believe that the department should look to extend and increase its activities. We welcome the recent “Food Matters” report from the Number 10 Strategy Unit, the creation of the Council of Food Policy Advisors and the announcement of the Foresight Report into global food security—all of which play a part in ensuring that government has a coherent food strategy. But action must be the key—and we feel that there has been considerable effort in identifying the challenges but too few clear actions outlined to date.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

3.20 As we have pointed out the UK is part of a wider food supply system. Although we have the ability to grow significant amounts of food domestically the integrity and stability of the overall supply system will be dependent on external as well as internal factors.

3.21 Increasing global food production to meet the challenge of population growth whilst also minimising the impact on the environment will be a significant and pressing challenge. Again, as we have detailed we believe that technology has an important role to play in helping the UK and all food producing countries to meet the challenge.



## Memorandum submitted by Sainsbury's (SFS 65)

### 1. INTRODUCTION

1.1 We welcome the opportunity to respond to the Committee's inquiry into "securing food supplies up to 2050: the challenges for the UK".

1.2 For context, key statistics on Sainsbury's:

785 stores, of which 276 are convenience

153,000 employees

Around 18 million customers a week

26,000 food/drink products (15,000 of which are own-brand)

1.3 We have been committed to supporting British suppliers and British farmers for over 130 years. We are committed to open, honest relationships with our suppliers and to offering sustainable British, regional, organic and Fairtrade products in our stores. We are also recognising that our suppliers at home and abroad often need a helping hand.

1.4 We have a clear and longstanding commitment to sourcing from the UK—we have a disproportionate market share in key areas such as UK fruit and vegetables, milk and meat.

### 2. EXECUTIVE SUMMARY

2.1 The UK has some of the strongest food standards—quality, freshness, taste, hygiene, "clean" ingredients and nutritional standards and animal welfare—in the world.

2.2 It is important to recognise that securing our future food supplies does not mean sourcing only from the UK, or at the detriment to the rest of the world. However, the Government needs to look at how we can increase our ability as a country to eat British "in season" products and how we can improve our capability in this area.

2.3 We have robust supply chains in the UK and around the world, but this has only been possible because of building relationships with suppliers and farmers. Working with them to understand customer trends, and future long-term planning requirements helps to ensure a continuous supply and a mutually advantageous relationship.

2.4 While we play our part in being able to predict and plan for customer tastes and habits in the immediate and medium term (up to five years), and make our supply chains as sustainable as possible, there is a strong unmet need for DEFRA to offer a clearer future long-term sustainable food policy.

2.5 DEFRA must continue to advocate the advantages of free trade over protectionist policies around the world as a way to secure global supply chains.

2.6 DEFRA needs to show greater leadership on food and centralise policy within Government. Additionally, they need to promote the wider aspects of food (not just environmental) across Government and act as an advocate of the whole supply chain, particularly supermarkets.

2.7 There is a need for less regulatory burden on the supermarket sector. Increased regulation will add extra complexity and cost to the whole supply chain, not just to retailers. Continuing to keep our high standards does not correlate that we continue to need more regulation—in fact the opposite. A less regulatory regime will allow innovation and investment in the supply chain and enable retailers to continue to strive for better standards and food experiences for our customers.

### 3. *How robust is the current UK Food System? What are its main Strengths and Weaknesses*

3.1 As a major supermarket chain we apply stringent standards to our products ensuring they are of a high quality, fresh and sourced with integrity. In addition, we ensure that our suppliers, wherever they are located in the world, conform to the Ethical Trading Initiative principles around fair pay and treatment of workers.

3.2 We also believe that the overall UK food industry is a mature and sophisticated one, and has some of the highest standards in the world. This has been driven by the competitive-nature of the sector. The British Retail Consortium (BRC) has established a standard Audit, which is used pro-actively across the world by suppliers to BRC members, of which Sainsbury's is one.

3.3 Overall the UK's supply chain is secure and resilient, based on good national and global trading relationships. We have strongly invested in these relationships and furthermore, helped our suppliers grow their businesses. For example, we have been trading with the same own-brand tea supplier, Finley's, for 105 years. The introduction of Fairtrade (for example 100% of our bananas and tea are Fairtrade certified) has ensured we have longstanding relationships with producers in the developing world. This helps protect against global price fluctuations and allows suppliers to invest in the development of their local communities. Through that resilience we are in a strong position to respond quickly to interruptions in the

supply chain and to problems caused by contamination. As an example, we were able to respond quickly and positively, and continue normal trading in the outbreak of the Sudan 1 contamination. Similarly, we were able to flex our supply chains to take into account the public concerns around the recent pork dioxins contamination scare. There may however, be unavoidable and continuing interruptions to the supply chain due to extreme circumstances such as the weather or the need to move where we source from. A lack of Government coordination or intervention can worsen the situation.

3.4 The UK has a unique and diverse climate which helps spread the risk of a UK wide interruption to the supply chain and helps contain problems, while ensuring all round seasonal continuity. For example, our mixture of hill upland and lowland helps to ensure a regular rich variety of home grown produce and meat.

3.5 Consumers' perception of the current food supply system is strong, with recent research by the Institute of Grocery Distribution (IGD) finding high support for British farming, recognition of the high hygiene standards in the system and a desire for strong animal welfare standards.

3.6 However, there are constant and on-going weaknesses in the system. Food inflation is a constant concern. For example, while we continue to support the British pig industry through increasing the price we pay our suppliers and through working in partnership, global economic conditions have led to increases in feed prices which have hit the pig sector hard. Currency fluctuations add to the pressures on our ability to trade and ensure a constant supply.

3.7 While, to some extent these pressures are outside the control of the UK Government, the degree to which the food industry is heavily regulated in this country, adds complexity and cost to the supply chain. This is something we believe the Government can do something about.

#### 4. *How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable*

4.1 It is imperative that DEFRA and the rest of the food supply chain have a long term strategy based on consumer insights and behavioural trends to ensure a food system that is sustainable. There is a need as well, to educate people about the advantages of eating British "in season" products. This will help to shape consumer buying behaviour and habits, and help to maximise the advantages we have in the UK of high quality in season fruit, vegetables and meat.

4.2 However, to meet this challenge we must recognise the value of both UK food and global trade, supporting both British and overseas suppliers and farmers. This involves working with suppliers and farmers to raise their capability and skills to ensure they develop sustainable businesses. We work with our processors and producers to plan forward requirements, such as sharing sales patterns and future estimates, customer trends and customer insights/demands. This helps suppliers plan for future demand and react to how the market is working, which in turn, ensures a continuity of supply.

4.3 While we work with suppliers to plan for the immediate and medium term demand—up to five years—there is currently a lack of a wider Government engagement on this issue. We need clarity on policy, not further analysis, from DEFRA on long-term sustainable demand and how the whole of the supply chain can better plan and work towards it.

4.4 *A UK farming example:* In 2006 we established the Sainsbury's Dairy Development Group (SDDG). 325 farmers are involved and supply our processors, Dairy Crest and Robert Wiseman. The group was set up to help those farmers achieve higher levels of profitability through innovation and efficiency projects, such as Herd Health and Husbandry, Environment and Energy, Collaborative working and Business improvement. In return for this commitment, members receive price premium above the processors standard price. In June last year we announced that SDDG would be linked up with Anglo Beef Processors to supply them with dairy herd cull cows. This initiative provides an extra revenue stream for dairy farmers, with an extra 20p per kilo and quarterly bonuses being paid.

4.5 *A UK supplier example:* We started working with Grahams Dairies of Stirling three years ago when they were supplying a limited range of milk and butter products through a third party. We now work directly with them, providing an opportunity to supply a much larger range of our own brand milk and butter. We supported them with developing the skill and contact base. They are now one of our fastest growing UK businesses.

4.6 *Overseas suppliers/farmers example:* In 2007, together with Comic Relief and the Fairtrade Foundation, we established the Fair Development Fund to help more farmers and growers in the developing world to sell their produce as Fairtrade. The Fund supports farmers' groups to meet Fairtrade standards and improve the quality of their crops. Last year, it specifically helped farmers in rural Uganda to supply dried fruits to an export market and small-scale peanut farmers in Malawi to buy seeds or machinery.

4.7 Food fraud is something that could potentially threaten the UK's ability to respond to the challenge of increasing food production, and is something that the Government need to continue to be vigilant about. However, as a country, we equally have some of the highest food standards in the world and this should help protect the supply chain against any food fraud threat. It needs to be an issue that is taken seriously at an EU level.

5. *In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system*

*Soil quality:*

5.1 Given the recent European Parliament ban on some pesticides, DEFRA faces the challenge of advocating the merits of natural soil health through reducing pesticide use, while continuing to ensure high crop yields.

*Water availability:*

5.2 This is a key issue for global food production. An inconsistency in rainfall is an on-going concern and is something that will continue to affect UK and overseas production. In addition, the demand for water will continue to be a major factor and will dictate how sustainable some products are in the future, both within the UK and abroad. The IGD are looking into the issue of embedded water in products, but it is still at an early stage and it will take some time for customers to understand its impact.

*Marine environment:*

5.3 There will undoubtedly be an increase in demand on fish stocks in the future and there is a need to ensure continued sustainability. We have helped to improve the sustainability of fish stocks by introducing a traffic light sustainability rating system. By working closely with the Marine Conservation Society, suppliers and campaigners, we feel this is a good way to help conserve current stocks. We no longer sell any red-rated fish (major concerns about stock levels) and we are working with suppliers to move to any Amber-rated fish (concerns, but action being taken) to Green status (scientifically verified to be in plentiful supply).

5.4 We would also argue that there should be better use of technology to help with registering landing catch. This will make the system more efficient and ensure quotas and by catch regulations are adhered to, across the EU.

*Science base:*

5.5 We are concerned that there is a distinct lack of a Research & Development base in the UK. There appears to be a lack of commonly-agreed and recognised centres of excellence for food policy research, with duplicate activity and communication. The UK suffers from a lack of applied science and research, with too much emphasis on academic-based research. For example, our Dairy Development Group has pioneered carbon footprint measurement within the dairy sector which will ultimately help dairy farmers reduce greenhouse gases by up to 10%.

*The provision of training:*

5.6 There is a strong need for increased apprenticeship training—in the traditional “craft” industries such as bakery and butchery. In 2008, we recruited 110 apprentices with a further 200 apprenticeships planned for this year. There is also a lack of food technologists coming through into food manufacturing and food retail, owing in part to a reduction in food science degree courses. This is a major challenge as without an adequate supply of food technologists it will be difficult to continue to progress research and development.

*Trade barriers:*

5.7 To support the initiatives outlined above we need to ensure that there is more focus on trade, and its wider benefits, rather than a protectionist approach. Through trade we can help developing countries grow while benefiting our own economy. The flexibility of our supply chains support free trade and can deal with everything from changes in quality in produce. As an example, we were able to swap trade from Spain to Morocco when quality problems affected the standard of nectarines we were receiving from Spanish suppliers.

5.8 However, there is a danger that in the current times countries badly affected by the economic crisis will retreat to a protectionist trading position. The UK Government recognises this. We fully agree with the Secretary of State for Environment, Food and Rural Affairs, Hilary Benn MP, when at a Chatham House conference on “Food Security”, he said that “if protectionism is the answer, someone is asking the wrong question”. We also agree with the Secretary of State’s comments that as a country we need a trading system that is strong, open, global and sustainable. The Government needs to continue to advocate this approach as the best model to bring positive food production outcomes, not only for the UK, but for other developed and developing countries as well.

6. *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect?*

6.1 Taste will always be a key driver for customers and our research shows that “tastes amazing” constantly outweighs other criteria in terms of food importance. While other aspects such as price, provenance and ethical consideration will continue to feature strongly, it is unlikely that they will feature higher than taste.

6.2 Customers are adapting to the current economic situation by economising on food shopping. Our economy *Basics* range has seen significant sales growth, particularly in the produce range, along with an excellent response to our *Feed Your Family For A Fiver* campaign (*FYFFAF*). Customers are also increasingly looking to shop on promotions to save money and are planning ahead more. As part of the *FYFFAF* campaign and more general concerns about the economy, we have seen customers planning ahead more, and looking for “deals” in their weekly shop. Our research has also shown that customers are now more engaged in eating leftovers and freezing meals given the impact on food waste and the environment.

6.3 While customer fears about the credit crunch have resulted in a reduction in meat sales, we have also seen customers “eating out at home” more. To coincide with this, we have seen higher sales of better cuts of meat. However, this does not mean customers are compromising on ethics, with demand for higher welfare chicken exceeding supply.

7. *What role should DEFRA play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership should DEFRA provide to the food industry?*

7.1 With regard to global food “politics” DEFRA must continue to promote free trade over protectionist policies and actively encourage other countries, including those within the European Union, as well as developing countries, to see the advantages of free trade.

7.2 Greater prominence and leadership needs to be given to food by DEFRA. The Department is uncertain about its role and has at times, a fundamental lack of understanding about how UK supply chain operations work. Those tasked with formulating policy need to have a better understanding of food culture and the impact of regulation. This is particularly needed beyond the farm gate and DEFRA needs to see its role as a supportive partner focused on more than just the farming and production aspects of food policy.

7.3 There is a need for a clearer, evidence-based and simplified deregulatory agenda in order to strengthen the UK food system. This needs to be directed by the UK Government and devolved administrations. It must also, however, include a direct lobbying strategy of the EU, where a significant amount of our food law originates.

7.4 It needs to be understood by ministers and officials that adding extra cost and complexity, through increased regulation, to the supply chain will not achieve a better performing sector. For example, the introduction of a Grocery Ombudsman (a recommendation of the Competition Commission inquiry into the sector) will not be practicable, would duplicate the work of the OFT and would not be cost-effective. It does not correlate that we have been able to obtain some of the highest food standards in the world because we also have some of the most regulated markets. A clearer, less contradictory and uncluttered regulatory regime will encourage more innovation, drive higher standards through competition and encourage companies to invest in increased expertise and development.

7.5 While we recognise the establishment of the Council of Food Policy Advisors, reporting directly to the Secretary of State, given that one of our main competitors is on the Council, we will have to evaluate how we interact with the group. DEFRA therefore needs to work out how it can encourage stakeholder participation in overall strategic policy, while recognising the competitive nature of the sector.

7.6 While we welcome programmes such as DfID’s “Food Retail Industry Challenge Fund”, which is designed to challenge the private sector to increase food trade from African farms to the UK, there is also a need for DEFRA/DfID to actively improve their involvement in encouraging good practice in food production in developing countries.

7.7 DEFRA has a chance to grow its role in advising and “translating” EU legislation for farmers, by offering practical guidance. For example, DEFRA should be proactively engaging with farmers over the European Parliament pesticide ban to advocate the advantages of improved soil health, while ensuring that food prices do not escalate or crop yields reduce.

8. *How well does DEFRA engage with other relevant departments across Government and with European and international bodies, on food policy and regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

8.1 We would question how well DEFRA is able to engage and promote food policy across Government. In previous sections we have outlined our concerns about their lack of prominence and leadership within government in supporting and “sponsoring” the food industry and particularly the supermarket sector.

8.2 There has been a lack of central co-ordination across Government departments with regards to food policy, which the *Food Matters* report clearly identified. While we are encouraged by *Food Matters* and its recommendations for food policy to be centralised and recognised through a cross-government committee, there needs to be a much clearer explanation of how this committee’s decisions will influence individual department’s decision-making. The committee and its decision-making would also benefit from input from the sector to explain the implementation and practical aspects of policy-making.

8.3 With regards to “external relations” with the devolved administrations there needs to be a consistent approach to food policy. This is in order to maximise resources and ensure a consistent approach to administering regulation. Consistent differences in food policy will result in additional costs and complexity, and result in a poorer product and service for customers.

8.4 DEFRA needs to play an active role in the development of EU food legislation, but must ensure there are clearly defined roles between, for example, DEFRA and the Food Standards Agency (FSA), to avoid duplication.

8.5 DEFRA needs to have a more joined-up Research and Development strategy which encompasses other government departments. It also needs to communicate its aims and objectives to interested parties, such as supermarkets, much clearer.

9. *What criteria should DEFRA use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

9.1 One clear measure might be the balance of imports in food categories where strong UK production infrastructure exists such as vegetables.

9.2 There is also a governance point—while we have a strong and vibrant supermarket sector, DEFRA should consider looking at other countries to formulate best practice in monitoring the governance and implementation of food policy.

January 2009

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#### **Memorandum submitted by Derek Mead (SFS 67)**

It is about time someone considered that with a population of 60 million people, it is vital that we should have a secure food supply. Some people estimate that our country’s self sufficiency is less than 55% and that we are only three days away from anarchy if food supplies were stopped from coming into this country.

I have been very concerned about this issue for many years. I am founder member of Farmers for Action and have been on the NFU Council for the past 6 years. I feel that we are weak and are controlled by the supermarkets, who have recently been driving British producers out of business.

The main NFU representatives are more concerned about lap-dogging to the supermarkets, to maintain their supermarket margins and have no respect from Defra. They are more worried about their non-executive directorships. We need stronger representation. The supermarkets are very well run and convenient for the public, although I would argue not necessarily the cheapest.

A perfect example of the supermarkets’ power is the downward pressure on the price of milk. In Britain we only produce 83% from our own milk supplies and we are 1.5 billion litres below quota. We are loosing 100 milk producers each year, both small and large operations, because we have no real sustainable future to maintain the businesses properly.

I have recently been given a figure that suggests that the current realistic cost of milk production is 29.7 ppl. Whereas the milk buyers are pushing down the price they are prepared to pay to farmers by up to 2.2 ppl. This means that the standard price from 1 February 2009 will be around 24.8 ppl, when it costs nearly 30 ppl to produce.

The dairy industry is not the only sector that is suffering. We have seen our national pig herd decrease from 900,000 sows to c 400,000. The same can be seen with poultry and eggs. Beef prices are back to pre-BSE levels, but only because we have stopped South American beef imports because of their continued F&M status.

Defra are continually treating farmers as second-class citizens. We have a major problem with bTB and the next thing will be the co-responsibility levies. We will have to pay this, without any consultation or the strengthening of port of entry controls. The farmers haven't been the ones to bring F&M back into this country. It was through Defra's irresponsibility and the food industry's import from endemic countries.

I have covered a range of different issues in the above and I would be very pleased to attend an Efra Committee meeting in order to have the opportunity to share my views.

I am a Somerset farmer, with 1,700 acres, 350 dairy cows, sheep and arable. I also have a farm shop complex and an open farm, with the aim of educating the public on farming and where our food comes from. In addition, I have recently built the Sedgemoor Livestock Auction Centre, the largest of it's kind in the South West. I have an extensive cross section of experience.

*Derek Mead*

*January 2009*

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### **Memorandum submitted by Waitrose (SFS 68)**

#### EXECUTIVE SUMMARY:

There are a number of challenges facing the UK food system, notably from pressures on supply, environmental threats and the current economic climate. Principal stakeholders have to be responsible for recognising and addressing what they can do to promote the long-term sustainability of UK agriculture and the farmer supply base. Additionally, pressures on reducing the costs of production are being hindered by lack of investment in agriculture based science research. Only looking at short term solutions poses a significant threat to UK food security over the coming decades.

#### WAITROSE—BACKGROUND:

- (i) Waitrose, the food shops of the John Lewis Partnership, has 198 supermarkets in the UK, combining the convenience of a supermarket with the expertise of a specialist shop. Each one of our 40,000 employees (or Partners), is a co-owner.
- (ii) An additional 22 Waitrose branches will be opened across the country in 2009 as a result of organic growth and the acquisition of 13 Somerfield stores, creating jobs for 4,000 new Partners.
- (iii) We also own the Leckford Estate in Hampshire, a working farm producing wheat, milk, apples, pears, apple juice, cider, free range eggs, mushrooms and chickens.
- (iv) We extend the broader notion of partnership to our suppliers. Waitrose's whole business approach is deeply rooted in long-term, mutually beneficial relationships with its producers and suppliers. We were the first retailer to establish dedicated Producer Groups, which aim to ensure we consistently meet the quality and variety our customers expect in the long-term.

#### EFRA COMMITTEE QUESTIONS:

##### *1.0 How robust is the current UK food system? What are its main strengths and weaknesses?*

1.1 The UK food system is not as robust as many believe when judged by last year's spike in global food prices. This illustrates the significant challenges that lie ahead. Many sectors of the industry have become too concentrated. The poultry industry for example is characterised by a relatively small number of producers and a few very large processors. With a significant proportion of the ownership of these processors held by overseas companies, the potential disadvantage if supply was threatened in any way is increased.

1.2 The pig sector provides another example, as highlighted in the recent EFRA report on the state of the English pig sector. The national pig herd has fallen by 40% over the last decade; there has also been a reduction in production of 36% in the same period in addition to a significant rationalisation in the number of processing businesses operating. The result has been a significant rise in the volume of imported pig meat, much of which is produced to welfare standards which would be illegal in the UK. This is a scenario being mirrored across several sectors. Lack of profitability and the burden of regulation has led to an exodus of farmers and a subsequent growth in import requirements to satisfy consumer demand.

1.3 Contingency responses to recent instances of threats to the food chain (such as animal disease, the floods of summer 2007 and two wet summers) have shown that collaborative, trusting and well-established relationships between retailers and their suppliers/producers have proven crucial at times of crisis.

1.4 Increasingly the food chain is finding itself vulnerable to threats of a scale that cannot be protected by typical market mechanisms or other existing contingency procedures—from the combination of rising demand and limited resources, to climate change and risks to energy security. This is why it is so important that the principal stakeholders at every level of the food chain recognise and address what they can do to

promote the long-term sustainability of UK agriculture and the farmer supply base. Failure to do so, sticking instead to only considering short-term options, poses a significant threat to UK food security over the coming decades.

1.5 The number of European farm workers has been reduced due to the strong Euro and has decreased job opportunities in the UK. This places pressure on wages and affects the ability to harvest crops.

1.6 The market for organic fruit and vegetables has slowed, placing pressure on producers.

1.7 Best practice in the supply chain can be achieved by sharing information which helps protect brand integrity and drive efficiency. Maintaining standards help protect a brand and if they are shared, costs are reduced benefitting retailers and consumers. The Waitrose dairy model provides a good example. Up to 12 dairy farmers<sup>141</sup> are going out of business each week but Waitrose dairy farmers have the best levels of investment in the UK. Our business model is collaborative and allows farmers to get a fair return and take a leadership role in sharing best practice to improve efficiencies. This results in a cycle of better returns, more investment, better efficiency and sustainable businesses in the long term.

1.8 At the heart of our supply chain are our Producer Groups that operate across our livestock, milk, farmed fish, fruit and vegetable categories. These groups offer farmers a forum where they can share best practice and set mutual business objectives. At present we operate more than 30 distinct groups for livestock, from Aberdeen Angus beef to Select Farm chicken.

1.9 Waitrose is passionately committed to sourcing produce from UK producers wherever possible and from a wide a variety of small, local suppliers. We source 100% of our milk, eggs, chicken and pork from British producers, and support over 450 local and regional suppliers.

1.10 Clearly Waitrose is only one retailer in a crowded market place. Nonetheless, broader recognition is needed throughout the food chain of the importance of thinking long-term when it comes to sustainability, and the benefits to be had by all from securing a strong, competitive future for UK producers. Research and Development (R&D) is vital and a clear direction is needed from government. In addition, by applying science, better decisions for the future can be made, particularly when considering how to make the best use of our limited natural resources. For example soil health, efficient use of water, exploring varietal and breed development are key areas that can be investigated.

*2.0 How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

2.1 The UK faces a domestic as well as a global challenge to meet rising demand for high quality food from a growing population, with limited and potentially diminishing land resources. We must ask whether everything is being done to ensure UK producers are well-placed to meet this challenge over the next four decades.

2.2 It is important that there is a shared recognition of the scale and seriousness of this challenge. In addition, effective collaboration, where appropriate, is necessary at every level of the food chain, as well as across government and the wider public. For instance, the challenge to become a less wasteful society needs to be addressed by the public as well as by industry.

2.3 We must equip our food producers, particularly UK farmers, with the right tools to enable them to meet our food production challenges. This means: identifying what those tools are; investing in their development; encouraging innovation to drive efficiency of production; promoting skills and the flow of fresh talent into the sector. All of this needs to be underpinned by a coherent strategic approach and long-term investment.

2.4 In the 1970s and 1980s, the UK made great strides in farming productivity. This was primarily down to a well funded and co-ordinated programme of R&D on behalf of the industry. This kind of dedicated R&D has become a forgotten element and needs to be resurrected. This will require targeted investment, for instance in developing the UK science base in agricultural technologies.

2.5 The UK must make sure we are taking advantage of new and developing technologies to introduce efficiency and clarity.

2.6 Innovation need not be entirely technology-based either. For instance, Waitrose invested the necessary R&D into genetics on behalf of our pig farmers and supply food at competitive rates. These measures help to drive efficiency at a farm level, but also ensure Waitrose receives a consistent supply of high quality pig meat while the UK is experiencing massive reductions in herd size. As a consequence, Waitrose has been able to ensure that 100% of our pork, bacon and sausage are UK-produced. A collaborative approach would ensure that best practice like this can be shared throughout that sector to the long-term benefit of the whole food chain.

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<sup>141</sup> Source: DairyCo annual figures to December 2008.

### 3.0 *In particular, what are the challenges the UK faces in relation to the supply side of the food system?*

#### 3.1 *Water Availability*

The efficient use of water is vital as in addition to an increased domestic demand on supply, the effects of climate change will result in an overall reduction of resource, impacting on its use in agriculture. For example the last two wet summers have had a debilitating effect on the agricultural industry, leading to a loss of crops, reduced sales and poor yields.

#### 3.2 *Marine environment.*

Waitrose continues to actively promote responsible fishing, only stocking sustainably managed wild caught fish. This includes one of the largest ranges of line-caught fish on the high street. The range only uses farmed fish from carefully selected farms which have been cited for their respect for marine ecosystems, animal welfare standards and conservation measures.

#### 3.3 *Science base.*

While government funding for science doubled to £3.4 billion in 2007, funding for strategic and applied agricultural research has declined significantly with more emphasis being placed on environmental and socio-economic research. Investment via MAFF (now Defra) fell by 45% between 1986 and 1998 and overall Defra's funding for sustainable agriculture will fall by a further 20% by 2010–11 on top of a 12% cut in 2006–07. This reduction in funding has resulted in the loss of a number of agriculture research teams and their expertise, as research organisations have closed some or all of their facilities. Future government and industry research funding needs to be increased and focussed on how to produce more food safely and efficiently.

#### 3.4 *Farmed land.*

There are many competing demands for land use in the UK, not least growing pressure to use land to help meet our renewable energy obligations. In addition the amount of land will be reduced as farmers sell their farms. This acts as another barrier to entry for those looking to enter farming as a career. Defra has acknowledged that guaranteeing levels of UK livestock and arable output is crucial to UK food security in the long-term. Therefore, it should be supporting farmers by providing clear direction on the future of renewable energy opportunities in the UK and incentivising the use of existing farmland accordingly.

### 4.0 *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be the main effect? What use could be made of local food networks?*

4.1 The British public have moved from wanting access to a wide variety of high quality food at reasonable prices to becoming more cost and "offers" conscious. A proportion of the public are demanding to know that the food they buy is sustainably sourced, with respect paid to animal welfare and to the farmers responsible for producing the food. Waitrose mitigate costs through collaboration, setting standards and making every effort consistently through best practice to reduce costs to the consumer.

4.2 There is no sign yet that the economic downturn has diminished the demand for provenance amongst the portion of the population represented by our customer base. This continues to be borne out by our strong Christmas sales figures.

4.3 We are seeing an ongoing demand for quality food with sales of free-range increasing year on year. Although organics is slowing, it is not decreasing significantly in the meat and poultry sectors. However, Waitrose customers probably don't reflect the market as a whole because our customers do tend to make "ethical" buying decisions in preference towards fair trade, free range and organic. This leads us to over-index the grocery market share.

4.4 Buying British is important to consumers, but they are often not prepared to make product compromises when making a purchase. Ultimately, the products bought have to be fresh, good value for money and in the variety and format desired. For instance research shows that when consumers are faced with buying apples from the UK or New Zealand, price and quality will influence buying decisions. However, British flags on packaging have the potential to make consumers feel considerably better post-purchase about supporting farmers in the UK. It can also help them to think that they are eating seasonally—something else they claim is important. However, with consumers becoming increasingly savvy, sustaining high animal welfare and production standards does cost money and will impact on the weekly shopping bill.



4.5 Only with broad public understanding will we see the sea change in consumer behaviour needed to guarantee the sustainability of UK producers. That fundamental shift will be around recognising the greater relative value of “home-grown” British food from sustainable sources, and it will not happen without a stronger government-backed push. This needs to start with primary schools educating children about our strong UK farming industry coupled with promotion of a strong culture of British food.

4.6 Local food networks are absolutely key to promoting both of these. Waitrose “Local and Regional Sourcing” remains one of the most established local sourcing initiatives in its sector. The programme represents a breakthrough for small producers wishing to supply a multiple retailer, but unable to support a whole store network. Our dedicated local sourcing team continues to search the UK for the finest local and regional products, actively working with existing and new suppliers to take local and regional sourcing into new territories.

4.7 Our dedicated regional buyers work very closely with the regional food groups to source products that reflect the provenance of the area and celebrate artisan production. A number of producers that came to Waitrose under the Regional Food Project have since developed their business to supply us at a National level.

*5.0 What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

5.1 The challenges to government and Defra begin with the need to provide better strategic clarity. This must be on key issues to enable different parts of the food chain to focus their efforts in the right areas. While the tone of the government’s rhetoric has certainly become more focused on the challenge of food production in the last year, particularly since the publication of the Food Matters report, it is yet to translate into crystal clear leadership in key areas. Recommendations include:

- Lead on food issues providing clarity on food policy and environmental strategy.
- Be responsible for technical and scientific experience, directing the policy and strategy depending on what the ultimate definition of Food Security is.
- Develop a better understanding within the Department of the day-to-day realities of working within the UK food chain. Solutions offered at official level to recent instances of animal disease showed a poor grasp of “on the ground” practicalities for many farmers.
- Greater investment in R&D could help increase support to the UK farming sector and in the development of new practical non-GM technologies to help meet future demands.
- Promote and fund better education and training for farmers and address the skills needs of the farming sector in the longer term. For example ensuring there are enough young people coming into the industry with the expertise to produce the food that we are expected to need.
- Increase consumer education on upcoming threats and emerging solutions facing the food chain and the consequent importance of provenance and sustainability.
- Simplify regulations and remove unnecessary red tape where it exists in the food chain. In particular it should consider how the heavy-touch regulation that exists for the farming sector in the UK impacts on competitiveness and how it might achieve more consistency in the application of regulations across the EU.
- Better information sharing across regulatory bodies to reduce the burden but not the effectiveness of inspection. Re-visit existing regulations to ensure they are delivering their intended benefits, and not unintended and unhelpful outcomes.

*6.0 How well does Defra engage with other relevant departments across government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-government food strategy?*

6.1 Cross-government co-ordination has improved since the Strategy Unit’s Food Matters report in 2008, but the systems analysis offered by the project has yet to translate into more co-ordinated outcomes for players within the UK food chain. It is still not always clear that different parts of government recognise the impact that decisions made in other areas can have on the whole food chain. It is a challenge to Defra to ensure that effective collaborative mechanisms are in place with other Whitehall departments and regulatory bodies. These mechanisms need to deliver more visible or tangible benefits—not least through setting clear strategic priorities for food security and production across government.

6.2 For instance, the whole food chain would benefit from a clearer definition of the separate roles of Defra and the Food Standards Agency in terms of driving useful outcomes on food labelling. In addition, UK producers would also benefit significantly from clarity and action in the area of public procurement of food by government departments and exploring opportunities for more UK produce to be used by the public sector.

7.0 *What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

7.1 The strength and capacity of UK food producers are what will be most crucial to meeting future challenges on food production in a sustainable way, at the same time as guaranteeing food security for the population of the UK.

7.2 Defra is already in the process of identifying specific indicators or success measures for UK food security. This should be a collaborative one that draws directly on the experience of the UK farming and food sectors.

January 2009

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### Memorandum submitted by the Environment Agency (SFS 69)

#### SUMMARY

The UK agriculture and food sector has faced many challenges over the years and has evolved to meet them. Dealing with the effects of climate change and the sector's ability to maximise food production without compromising the environment will be key to the provision of secure food supplies up to 2050. The challenges are substantial and include:

- Adapting to changing weather patterns, rainfall distribution, quantity and storminess.
- Protecting natural resources including biodiversity, soil quality and carbon content.
- Adapting to sea level rise in coastal areas.
- Increased flooding of land.
- The use of land management approaches such as flood storage areas to minimise the flooding of households.
- Contributing to the objectives of the Water Framework Directive in terms of water quantity and quality, adapting to reduced quantities of available water in many areas;
- Adapting crop types to fit changing climatic conditions.
- Achieving a low carbon agriculture and food sector.

#### RESPONSES TO QUESTIONS

Q1. *How robust is the current UK food system? What are its main strengths and weaknesses?*

Almost three quarters of land in England and Wales is used for food production and the agricultural sector has demonstrated strength, adaptability and resilience over time. This provides a sound basis for the future.

#### *Strengths*

- The ability of the sector to adapt to changing economic signals and external pressures and to innovate when required.
- Its continued production, processing and distribution of food despite uncontrollable factors such as weather.
- Agricultural land provides environmental benefits such as being a major sink for carbon, rural landscapes and wildlife habitats. It forms a major part of the catchment for ground and surface water resources. The value of this is estimated to be around £1.5 billion per annum.<sup>142</sup>
- It is probable that the sector will respond to the necessity of change. With climate change bringing stormier and different weather patterns and changes in water availability and use there will be a need for land use and cropping patterns and crop types to change.

#### *Weaknesses*

- The UK food system has potentially negative impacts on the environment which need to be carefully managed. Some past damage, caused substantially by efficient response to the economic drivers of EU and UK agricultural policies, needs to be rectified or contained. These external costs, estimated as between £1 and £3 billion p.a. (O'Neill *op cit*), cannot easily be recovered.

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<sup>142</sup> O'Neill D (2007) *The total external environmental costs and benefits of agriculture in the UK*. Environment Agency report, 24 April 2007.

- Possible negative outcomes include soil degradation, biodiversity loss, water pollution, unsustainable use of water for irrigation and the emission of greenhouse gases (GHG) from livestock, land, food processing and distribution. The whole food chain is responsible for around 18% of UK GHG emissions.
- If the natural soil and water systems that underpin agricultural production are degraded and dysfunctional, food production will be compromised.
- Agricultural production is frequently dependent on artificial nitrogen and phosphorus inputs, which are derived from non-renewable resources.
- UK agriculture will need to adapt to a “low carbon” future, using less inputs from fossil fuel. This applies along the food system and will require innovation and support.

Q2. *How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

Despite its physical limitations, the UK does have the capacity to increase its food production through increasing inputs and bringing more land into production. The availability of water could become a major constraint in some areas. Careful management will be required to ensure that this expansion is not to the detriment of soil and water quality and biodiversity.

As the Common Agricultural Policy becomes progressively more market orientated, UK farmers will respond to consumer demands efficiently. We want to see environmental costs and benefits properly valued and accounted for as food production increases.

Q3. *In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

### 3a. *Soil quality*

Good quality soils with robust structure are essential to delivering sustainable food production. Their high quality needs to be maintained.

- *Impacts of intensification.* Increased use of pesticides and cultivation pose a risk to soil biota, soil organic matter and the structure of soils.
- *Use of marginal land.* Marginal land is often where shallower, poorly drained and more vulnerable soils are found, often with high wildlife and biodiversity value. Agricultural expansion should not compromise this vulnerability through overexploitation. In some situations these areas may be important for flood risk management.
- *Waste disposal.* The application of certain wastes to land has many agricultural benefits as well as manageable risks. Changing management practices for biodegradable wastes mean more organic material is being returned to land as soil conditioner.

### 3b. *Water availability*

The UK is facing significant pressure on its water resources. The changing distribution of rainfall, its intensity and quantity are already issues which we have highlighted in recent publications.<sup>143</sup>

The agriculture sector uses water for irrigation, principally in south and east England and often at times when water resources are particularly scarce.

Demand for irrigation water is likely to increase across much of England and Wales over the next 10 years, possibly by 25% by 2020, especially for vegetable production. By 2050 irrigation needs could be similar to those of southern Europe and may become a limiting factor for increased production.

Fluvial and coastal flooding and flood management affects UK farming and food production. Approximately 1.3 million hectares (ha) of farmland in England are within flood plains, including over half of the most productive land.<sup>144</sup> About 60,000 ha of agricultural land in England and Wales are protected through flood risk management and effective drainage.

Farmers will need to be imaginative in the way they deploy water tolerant crops in areas prone to flooding or used for flood storage schemes. 12,000 ha of flood storage areas have been created in 180 locations, not only providing the important function of storing excess water but also slowing down flood peaks and protecting other areas from flooding.

<sup>143</sup> Environment Agency (2008) *Water Resources in England and Wales—current state and future pressures* & Environment Agency (2008) *Climate change and river flows in 2050s*. Science summary SC070079/SS1.

<sup>144</sup> Environment Agency (2008) *Best Farming Practice*.

### 3c. *The marine environment*

The Environment Agency has very limited locus over the management of commercial fish stocks in the marine environment and we have no comment to make.

The effects of climate change, sea level rise and coastal erosion are felt in coastal agricultural areas. The Environment Agency's investment programme in flood defences is highly prioritised and some difficult decisions sometimes have to be made that could result in the withdrawal of maintenance in some coastal areas where primarily agricultural land is affected.

In time this could ultimately result in the overtopping of defences or loss of land. However, the area of agricultural coastal land lost since 1991 through deliberate managed realignment in England is about 1,000 ha. This is similar to the area of land taken by residential development each year.<sup>145</sup>

### 3d. *The science base*

Global and UK food production will have to increase to support increased population. Science will have an important role to play in leading the adaptation to climate change<sup>146</sup> and ensuring that inappropriate intensification does not cause unacceptable consequences such as extensive soil, water and wildlife degradation.

Government support for appropriately targeted and diverse agricultural research programmes and measures is necessary. The UK has already committed £400 million for agricultural research over the next five years. Wider land use and food policy should consider the interventions necessary to overcome obstacles to sustainable food production. The overall environmental impacts including emissions and resource use for different crops, animal husbandry and food production needs to be stabled.

### 3e. *The way in which land is farmed and managed*

Achieving a balance between the need to produce food, sustain viable businesses and protect the environment from further damage is crucial to the long term outcome. A secure agricultural system is one that is much less dependent on artificial fertiliser and that manages soil and water resources so that they are conserved for the future. Such practices are not yet truly embedded into farming policy, funding and land management.

There are five key areas where good land management practice is fundamental to achieving this balance.

- *Issues related to soil management, such as depth and direction of ploughing, overwintering of bare ground or winter crops, panning through use of heavy machinery, damage to soil structure and erosion.* We work closely with the sector in providing practical help and advice on how to manage these issues.
- *Water use.* We commented earlier on the issue of water availability (3b). It presents a serious challenge to the way agriculture develops in England over the next decades.
- *The use of nitrate and phosphate fertilisers, pesticides and other inputs.* Many rivers in England and Wales do not currently meet good ecological status in the draft classifications for the Water Framework Directive (WFD). Of the rivers that are in less than good status, 72% or 30,000 km of river are at either high or moderate risk due to phosphorus from agriculture. Our current monitoring shows many groundwaters have excessive nitrate levels which require expensive, energy intensive treatment when abstracted for drinking water. Agriculture is a significant contributor to the diffuse pollution of waterbodies.
- *Climate change, crop type and the ability of land to sequester carbon.* Nitrous oxide and methane emissions from agriculture are responsible for 7% of UK GHG emissions. To meet the UK's target of reducing emissions by 80% by 2050 (against 1990 levels), agriculture will have to deliver significant cuts.

Land has a great ability to sequester (absorb) carbon in soil and crops. The significance and scale of this is only just becoming apparent and research is being carried out to understand better the extent and opportunities this presents. This will make a very significant contribution to the adaptation to climate change.

Cropping patterns and crop types have already changed over the last two decades, due partly to plant breeding and to warmer temperatures and longer growing seasons. For example, maize is commonly grown in southern England and brings particular problems of land and fertiliser management.

- *Managing floods, coastal erosion, withdrawal from maintenance of flood defences.* This was addressed in 3c.

<sup>145</sup> Communities and Local Government (2007) *Land Use Change Statistics England*.

<sup>146</sup> *Science* 1 February 2008: Vol. 319. no. 5863, pp. 580–581.

3f. *The provision of training*

This requires investment and careful focus on the required outcomes to be fully effective. Encouraging compliance through support and delivery of advice so farmers understand their regulatory obligations is required by Regulators' Compliance Code.

Industry-led initiatives such as the Pesticide Voluntary Initiative raise levels of environmental awareness and hence improve farm practices. The Defra-funded England Catchment Sensitive Farming Delivery Initiative is demonstrating that by working in partnership with farmers, awareness of diffuse agricultural pollution has significantly improved, thereby contributing towards delivering the objectives of the Water Framework Directive.

The environment agencies' jointly funded NetRegs website and waste training tool for agriculture has now been expanded to cover the food and drink manufacturing sector. We intend to include a wider range of training support on other essential environmental issues such as pollution prevention and water conservation.

3g. *Trade barriers*

No comment.

Q4. *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habit, and what will be their main effect? What use could be made of local food networks?*

No comment.

Q5. *What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

We believe Defra should prioritise three policy areas to promote a robust agricultural sector and an increasingly secure food system.

- *Environment and resource protection and efficiency of use.* Defra should encourage initiatives that improve the resource efficiency and environmental performance of both agriculture and the food and drink manufacturing sector. A more integrated approach to water and soil management is necessary as well as further improvements in resource efficiency and reductions in the carbon, water and waste intensity of food production systems.
- *Reduce GHG emissions from farming, food production and distribution and promote climate change adaptation in agriculture.* Defra can help to provide the practical knowledge to take forward the Committee on Climate Change recommendation that Government focuses on developing a policy framework to reduce significantly emissions in the agricultural sector.
- *Sustainable consumption.* One third of food bought for domestic consumption in the UK is thrown away. Promoting sustainable consumption, cutting food waste and adopting more sustainable diets and supply chains is important in ensuring future food security. Government needs to show leadership in this difficult area of public policy. The overall environmental impacts of different food types need to be explained. When food waste cannot be reduced directly, anaerobic digestion and composting that prevent the land-filling of waste should be supported.

Q6. *How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

No comment.

Q7. *What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

Criteria in addition to existing measurements such as trends in nitrate levels in groundwaters could include:

- Water consumption: e.g. decrease in unit volume per tonne of product.
- GHG emissions: tracking reduction; progress towards low carbon production.
- Resource efficiency: including food wastage; reduction of food wasted against 2008 levels.
- Increase in agricultural research expenditure and take up of more sustainable agricultural farming methods.

- The overall environmental impact of food production as a function of the change in the mix of food types being consumed.

February 2009

### Memorandum submitted by Friends of the Earth (SFS 70)

Friends of the Earth welcomes the opportunity to respond to the Environment, Food and Rural Affairs Committee inquiry. Although levels of global food production are higher than ever before, the numbers of food insecure and hungry people reached 1 billion this year. We urge the Committee to address the challenge of how the UK can help build a more resilient and equitable global food system, as a focus simply on increasing production will fail to ensure UK or global food security.

This inquiry must also consider food and farming policy coherently, and not separate agricultural production from the food chain. It must also recognise that food security in the UK and abroad can only be achieved through a global sustainable food and farming system that takes into account the impact of UK food consumption and farming on global climate change, loss of biodiversity and genetic resources, and pressures on land use. To this end, Defra must integrate the findings of the International Assessment of Agricultural Science and Technology for Development (IAASTD) into all its strategies and policies, and work with other departments, notably DFID, to do the same.

*How robust is the current UK food system? What are its main strengths and weaknesses?*

#### *Strengths*

1. *Potential for self-sufficiency*: The UK's self-sufficiency in food is approximately 58% for all food and 71% in indigenous type food.<sup>147</sup> High levels of self sufficiency reflect a strong and resilient food system, and that self-sufficiency is a desirable policy goal for food security and environmental sustainability.
2. *Potential for domestic animal feeds*: The UK benefits from a diversity of land types that allows for a mixed agricultural sector, for example grazing land for cattle and sheep in the uplands, and fertile arable land for crops. We therefore have the potential to be much more self-sufficient, particularly in livestock production and the use of home-grown animal feeds.
3. *New entrants to organic farming*: Across the farming sector as a whole, employment is declining whilst the average age of farmers is rising. Organic farming is moving against the trend and retaining and attracting a new workforce. The Soil Association reports that organic farmers in the UK provide more jobs per farm than non-organic.<sup>148</sup> Furthermore, organic farmers are more likely to be engaged in business innovation activities and attract younger people into agriculture.
4. *Food awareness*: Consumer interest in the provenance of food is growing, as evidenced by flourishing local food networks. Although this is currently small, it is a strength of the UK's food system that should be encouraged.

#### *Weaknesses*

5. There is increasing evidence that food production has a major impact on the environment including contributing to climate changing emissions and loss of biodiversity. To ensure future production of food, production methods must be based on sustainable use of land and reduction in the use of finite resources in agriculture. International trade, finance and investment policies, including the drive for biofuels, further threaten food security and are primarily the needs of corporations, not people.
6. *Energy and climate change*: Conventional agriculture is highly energy intensive and the food chain is oil dependent at every stage, including processing, refrigeration and transport and distribution. A system dependent on high energy inputs contributes to climate change, exacerbating the vulnerability of agriculture globally. It is therefore necessary to halt any further centralisation of the food chain, and instead to reduce the energy dependency of the food system through more sustainable and localised, smaller-scale production.
7. Certain elements of the food system have high climate change impacts, notably meat and dairy production and consumption. Globally, livestock accounts for 18% of greenhouse gas emissions (GHG), from methane produced from ruminants, nitrous oxides and land use change.<sup>149</sup> Emissions from agriculture have stabilised within Europe and the UK in the last few years, mainly as a result of reduced fertiliser use. The implementation of the Climate Change Act can also help reduce domestic GHG emissions from food and farming. But with large quantities of feed crops and food now imported from South America, much of the UK's greenhouse gas emissions, particularly from livestock, have effectively been exported rather than reduced. The impacts of UK food and farming on global deforestation are particularly alarming. A recent

<sup>147</sup> Defra, 2007, *Food Statistics Pocketbook*.

<sup>148</sup> Soil Association, 2006, *Organic Works*.

<sup>149</sup> FAO. 2006, *Livestock's Long Shadow*.

study by the Tyndall Centre for Climate Change Research highlighted how levels of deforestation and greenhouse gas emissions from food production affect our potential to meet carbon reduction targets elsewhere in the economy. The study found that even if emissions from food production were halved by 2050, and if 70 to 80 per cent of the current forest carbon was preserved, global emissions from other sectors would need to peak by 2015 and then decrease by up to 6.5 per cent a year if there was to be any chance of avoiding dangerous climate change by limiting the temperature rise to 2°C.

8. *Land Use:* The UK requires a huge amount of overseas land to meet our consumption demands. The UK livestock sector for example is dependent upon imports of soy protein from South America for animal feeds. The conversion of forest and grassland to cropland is leading to devastating biodiversity loss, particularly in the Amazon region, the Brazilian cerrado, and the Atlantic Forest, and is a major source of greenhouse gas emissions. The UK is currently using 1.4 Million hectares of land in South America to produce soy primarily for use in livestock feed. This is contributing to food insecurity by reducing the production of staple crops in the region and by the displacement of thousands of small food producers. The system is not working for farmers in the UK either. As commodity prices fluctuated, farmers saw the cost of animal feed and other inputs increase. The price of fertiliser increased by 156% in the last year. The cost of chicken feed increased by £80/tonne in the same period. Pig farmers have been hit by volatile feed costs and the UK pork sector seen its market share shrink.

9. *Global inequity and trade injustice:* Although we produce enough food to feed the global population, one billion people now go hungry. International trade policies have allowed large transnational corporations to enter Southern countries and force small scale, local farmers out of business and off their land. Impoverished people around the world rely on their small, local farms but local producers and subsistence farmers are being replaced by export-oriented large-scale agriculture, turning food into a commodity to be speculated on and from which to make a profit. Current agricultural trade policies, which look to open up agricultural markets and increase free trade in agricultural products, will exacerbate the current problems. The “dumping” of highly subsidised products on developing country markets combined with disinvestment by Governments in agriculture following liberalisation policies has undermined global agriculture systems for decades. Agricultural trade liberalisation has also encouraged developing countries to focus on export oriented agriculture feeding western markets rather than themselves. In addition to exporting environmental impacts, this system also ensures that the UK uses more than its fair share of global natural resources. Despite this the UK continues to focus on promoting imports as a means to achieve food security. Possibly the biggest impact for small-scale producers across the globe would be the promotion of trade policies that protect their local and regional markets without fear of dumping of subsidised imports, and which allow the maintenance of strategic grain reserves. The forced trade liberalisation policies of the past have no place in a future food system that puts people and the environment first.

10. *Corporate control of the food system:* Much of the global food system, from seed and fertiliser supply to trade and retail, is in the hands of a few large corporations who are not providing short or long-term stability in food production and supply. The price volatility resulting from increased corporate control of food trade is hugely damaging to farmers’ incomes. Corporations must be made accountable by national law for the impacts of their operations and must be legally obliged to pay a fair price for farm goods. Governments must also shift their funding away from research and development of technologies and products which help to meet corporate demands for cheap raw materials. Instead they should use the funds to research modern, sustainable, low impact farming technologies.

11. *Self-sufficiency:* Whilst the UK currently has self-sufficiency levels of approaching 60%, this is in long-term decline with reliance on imports making the UK more susceptible to disruptions. High self sufficiency in food must be a central plank of a food security policy for the UK.

12. *Fairness in supply chains:* The low prices paid to farmers undermines their ability to produce sustainably. Consolidation of the grocery market has given the supermarkets considerable buyer power and farmers’ share of a basket of food staples has fallen by 23% between 1988 and 2006.<sup>150</sup>

13. Throughout the Competition Commission’s recent inquiry into the grocery market, farmer organisations and civil society groups provided evidence of the unfair terms of trade and abuse of buyer power by supermarkets.<sup>151</sup> As the Competition Commission concluded, supermarkets’ supply chain practices harm suppliers and have an adverse effect on competition.

14. To achieve a more secure and sustainable food system we need fairer trade across the whole supply chain. Government has a role in ensuring farmers are receiving fair prices for their produce and must support the Competition Commission’s recommendation for an independent supermarket Ombudsman.

15. A diverse retail sector is also in the interests of UK consumers and to ensure food access. Small shops and street markets are vital for low income groups and those with limited mobility, such as the elderly. Government must introduce strong town centre planning policy with a qualified presumption against out of town development and support for diverse forms of retail.

<sup>150</sup> Defra, 2007, *Food Statistics Pocketbook*.

<sup>151</sup> Competition Commission, 2008, *Final report groceries market inquiry*.

16. *Workforce:* Despite more positive trends in the organic sector, the farming industry as a whole is experiencing unwelcome demographic change, with an ageing population and a net loss of workers. Accompanying the decline in the workforce is a loss of skills and traditional knowledge that must be reversed.

*How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable?*

17. It is concerning that much of the policy debate is centred on the drive to increase production, without addressing inequitable consumption globally. The perverse consequences of the modern food system are illustrated by the fact that the number of people suffering from malnutrition is now roughly equal to the number of obese. Food distribution, infrastructure, access and justice must be addressed urgently.

18. Friends of the Earth believes that a secure and sustainable food system will not result from further intensification of agriculture, but by assessing land use needs and ensuring an appropriate farming mix. The UK's policy objective for a robust UK food system can be met by building domestic markets for farming, rather than pursuing a narrow focus on competitiveness in global markets. There is also a moral obligation, as part of a wider global food security strategy, to strengthen our own food production base, including the production of protein for livestock.

19. The UK's international development policy must support countries' food sovereignty, promoting their right to enough nutritious, ecologically produced and culturally appropriate food.

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system:*

20. Due to our increasing reliance on imports, the challenges of UK consumption are global. Our impacts on soil quality, water resources, greenhouse gas emissions, rural communities and biodiversity are felt across the world.

#### *Soil quality*

21. Intensification of agriculture has led to soil degradation including erosion and nutrient depletion. Soy production overseas for animal feed for intensive livestock depletes soil's nutrients and requires ever-increasing amounts of fertiliser to compensate. Conversely, extensively grazed livestock, for example in the Uplands, brings biodiversity and landscape benefits and maintains soil carbon sinks.

22. The demands of the modern food system are leading directly to ecosystem degradation, threatening our ability to grow food. Due to lack of government support and development, organic and other ecological systems, including rotations, mixed farming and low-input systems, remain a niche. There is a clear need for more government support.

23. Protecting soil quality can also have a major impact in preventing dangerous climate change. The UK, for example, has been losing 13 million tonnes of carbon from its soils each year for the past 25 years. Inappropriate agricultural practices accelerate water and wind erosion and the decline in organic matter, leading to a loss of soil fertility. Too many animals grazing in a given area and inappropriate use of heavy machinery make the soil too compact. It is estimated that the cost of soil degradation in the EU is around EUR 38 billion each year. Preventing soil erosion should be an important aspect of maintaining Good Agriculture and Environmental Condition under Cross Compliance, and a target of soil protection options under Environmental Stewardship.

#### *Water availability*

24. Embedded water is a major sustainability issue for the food system. UK consumption places stress on water resources globally, particularly through livestock and the unseasonal consumption of fresh produce from water-stressed areas.

25. Globally, agriculture is by far the biggest user of water, accounting for 70% of global water use.<sup>152</sup> Large-scale irrigated agriculture can cause depletion of groundwater, high salinity, and water and soil contamination by pesticides and fertilisers. Intensive livestock production is particularly inefficient in its use of water, with, for example, six litres of water required for one kilo-calorie of beef.<sup>153</sup> Animal feed production is also dependent upon irrigation to boost yields, with the FAO estimating that 7% of global human water use going into growing feed crops for livestock. The UK uses 1.43 billion cubic metres of Brazilian water a year through imported soy.<sup>154</sup>

<sup>152</sup> UNEP, 2000, *Global environmental outlook*.

<sup>153</sup> Waterwise, 2007, *Hidden waters*.

<sup>154</sup> WWF, 2008, *UK Water footprint*.



*The marine environment*

26. Three-quarters of the world's fish stocks are fully or over-exploited.<sup>155</sup> The UK's seas are dangerously overfished and fish stocks are declining. North Sea spawning populations of cod, herring, halibut and whiting are at all-time historic lows, and if we continue to fish for them at unsustainable rates of harvest they will very likely cease to be available for food. The Marine Bill must incorporate sustainable harvesting levels.

*The science base*

27. Defra must increase public funding, or redirect existing funds, such as those destined for genetically modified crops, for research into modern sustainable farming systems which use lower levels of livestock and inputs and which maximise the potential for mixed farming.

28. Defra invests a very small proportion of its total available funding for research and development into sustainable agriculture. In 2007, the Government spent £50 million on agricultural biotechnology research, including GM, with just £2 million going directly to organic research, despite the benefits of organic farming recognised by Defra.<sup>156</sup>

29. Friends of the Earth believes that GM crops do not address hunger or poverty, and instead risk diverting resources away from food for the hungriest and exacerbating the problems brought about by intensive agriculture. Contrary to claims by the GM industry, the recent International Assessment of Agriculture for Science and Technology for Development (IAASTD), endorsed by 58 countries including the UK revealed that there was no conclusive evidence that GM crops have increased yields.<sup>157</sup> Instead crops have been modified to be resistant to insect pests and tolerant to herbicides, resulting in a dramatic increase in the use of chemicals to deal with the weeds that develop resistance to the chemicals over time.<sup>158</sup> GM crops have been used for more intensive production methods by big companies, mainly to produce animal feed, at the expense of local farmers and the natural environment. All GM crops also need expensive inputs, like oil-based, climate-damaging fertilisers and chemical sprays and further entrench the intensive model of farming. GM seeds usually cost more than non-GM, and as they are patented by multinational chemical companies, seeds cannot be saved by poor farmers to use in future years. This makes GM a high risk technology to pursue for small farmers worldwide.

30. Friends of the Earth believes the UK Government must stop pushing for weakening of EU legislation on GM and the cultivation of GM crops in the UK. Internationally, the UK Government must stop pushing GM as a new green revolution "solution" on poor countries such as in Africa.

31. All funding for agricultural science and technology research from the UK Government must be directed at research fully in line with the findings of the IAASTD. IAASTD concluded that public funds should be directed towards agro-ecological research combined with traditional knowledge. Funding currently directed towards large-scale industrial monocultures via the World Bank and other international financial institutions should be redirected towards smaller-scale sustainable agriculture that stimulates rural development and local markets.

32. In the UK, research is urgently needed to investigate changes to livestock breeds, alternative home-grown feeds to soy, and cropping systems.

33. To facilitate this research and to provide an appropriate and well-funded institutional setting, the government should set up a Sustainable Agricultural Research Council. Organic mixed farming systems in the UK provide a valuable research base, having benefited from a considerable period of investment in breeding, cropping and input testing to maximise outputs whilst minimising impacts.<sup>159</sup>

34. Public funds must also be spent on social research to identify ways to change lifestyles and behaviours including helping consumers choose diets containing lower levels of livestock products.

*The provision of training*

35. As noted earlier, the UK is suffering from a declining and ageing farming workforce. It is therefore important to retain traditional knowledge and ensure appropriate knowledge transfer.

36. Farmers also need training in adapting to climate change and managing land sustainably. Priorities for training are to improve the sustainability of agriculture through promotion of biodiversity, low input farming, mixed farming systems, and greenhouse gas management on farm and through feeds and inputs.

<sup>155</sup> FAO, 2005, *Review of the State of the World's Fisheries*.

<sup>156</sup> Friends of the Earth, 2007, *Planting Prejudice* [http://www.foe.co.uk/resource/briefings/planting\\_prejudice\\_full.pdf](http://www.foe.co.uk/resource/briefings/planting_prejudice_full.pdf)

<sup>157</sup> International Assessment of Agriculture for Science, Technology and Development (IAASTD), 2008.

<sup>158</sup> Friends of the Earth International, 2008, *Who benefits from GM crops?*

[http://www.foe.co.uk/resource/briefings/who\\_benefits.pdf](http://www.foe.co.uk/resource/briefings/who_benefits.pdf)

<sup>159</sup> Friends of the Earth, 2001, *Get real about food and farming*.

*Trade barriers*

37. Global trade, finance and investment policies have driven the globalisation and intensification of the food system, undermining food sovereignty and creating social injustice and environmental degradation.

38. The prioritisation of global markets over local food markets has exposed farmers all over the world to high volatility in commodity prices, to cheap imports from highly subsidised western industrial farming and has therefore undermined the production of staple food crops. The focus on producing commodity crops for export markets disrupts peoples' access to sufficient, nutritional food and diverts resources away from developing local markets for small scale agriculture.

39. Friends of the Earth believes the export-led model of development is deeply flawed. Developing countries have been encouraged to rely on export-led production largely to feed high levels of consumption in the industrialised countries at the expense of local food sufficiency, leaving them vulnerable to sudden changes in price. Many food and feed exporting countries did not benefit from the recent high prices because they have become dependent on expensive imported food to feed their own population. They have also been forced to open up their markets to cheap highly subsidised food from the EU and US and dismantle buffer stocks.

40. Pursuing agricultural trade liberalisation will further increase countries' dependence on food imports instead of encouraging governments to increase domestic production and rebuild local food systems. Governments need to have a range of tools at their disposal to build resilient food and agricultural systems that are ready for the challenges that lie ahead, in particular the challenge of dealing with the impacts of climate change. This means policies which increase national food sovereignty, encourage local investment in local markets, support sustainable small-scale farming, safeguard local production from dumping, implement genuine agrarian reform, and allow trade instruments such as quotas and tariffs.

41. Friends of the Earth strongly urges the UK government to not encourage countries into a one size fits all solutions or to open up their agricultural sectors but to allow them to put in place food policies that are appropriate to their national context.

42. We also believe that international trade rules can no longer ignore the distorting levels of market power held by a few transnational companies in global commodity and food markets. The ability of corporates in the food chain to make record profits in the midst of a global crisis while food producers and consumers suffer, is indicative of the monopoly control and power that they have been given in the current model of globalised agriculture.

43. The Blair House limits on oilseed production have driven Europe's reliance on imported animal feeds.

*The way in which land is farmed and managed*

44. Food production is at the heart of sustainable land use, yet as farming has become increasingly mechanised and intensive, the overall environmental effect has been negative.

45. The external environmental and health costs of agriculture in the UK are estimated to be approximately £1.5 billion per year, including £150 million from losses of biodiversity and landscape value.<sup>160</sup> Government policy must be directed towards enabling a net positive environmental benefit from farming, promoting sustainable small-scale farming and appropriate land use which supports upland livestock, organic and other systems.

46. Inappropriate livestock production is a major cause of environmental problems. As the Millennium Ecosystem Assessment concluded, "*intensified livestock production poses serious waste problems and puts increased pressure on cultivated systems to provide feed inputs, with consequent increased demand for water and nitrogen fertilizer.*"<sup>161</sup>

47. Already livestock use two thirds of global arable land, and if present trends of meat-eating continue, then by 2050 the world's livestock will be consuming as much as 4 billion people do.<sup>162</sup> Demand for livestock products puts pressure on land to produce grain and protein feeds, mostly soy. At present the EU is the world's largest importer of soymeal and the second largest importer of soybeans in the world.<sup>163</sup> The UK is a large poultry producer and consumer in Europe, also consuming vast quantities of soy for animal feed for poultry and other livestock sectors.<sup>164</sup>

48. Almost 90% of soy imported into the EU comes from South America where it is a serious threat to natural habitats, livelihoods, diversity and local food production. Between 2004 and 2005 approximately 1.2 million hectares of rainforest were felled as a result of soy plantations largely for export to meet European

<sup>160</sup> Pretty J, Ball A, Lang T, Morrison J, 2005, Farm costs and food miles: an assessment of the full cost of the UK weekly food basket.

<sup>161</sup> Millennium Ecosystem Assessment, 2005, Volume 1: Current State & Trends.

<sup>162</sup> Colin Tudge, zoologist, author of "So Shall We Reap" (Penguin 2003)

[http://www.ciwf.org.uk/includes/documents/cm\\_docs/2008/g/global\\_benefits\\_summary.pdf](http://www.ciwf.org.uk/includes/documents/cm_docs/2008/g/global_benefits_summary.pdf)

<sup>163</sup> Friends of the Earth, 2008, What's feeding our food?

<sup>164</sup> Table 5.16 Poultry and poultry meat: United Kingdom, UK National Statistics, 27 March 2008.

demand for animal feed and increasingly biofuels. This has resulted in food insecurity, rising global prices and demand. It is also responsible for causing significant greenhouse gas emissions, natural resource depletion threatening future food production.<sup>165,166</sup>

49. A Joint Nature Conservation Committee study in 2006 has indicated that UK consumption of soy has a significant impact on areas of high biodiversity in South America. Since then, UK imports of soy from South America have increased.<sup>167</sup>

50. In the short term, one of the major threats to global food security comes from the diversion of food crops to fuel production, driven in a large part by US and EU policies and subsidy programmes. Biofuels have been identified by the World Bank, IMF and several international institutions as a key cause of the food crisis by increasing demand for crops such as grain and corn and increasing competition between food and fuel.<sup>168</sup> Intensive biofuel production also destroys the livelihoods of small scale farmers and production of local staple food crops, threatening national food security.

51. The UK Government's Gallagher Review into the indirect impacts of biofuels confirmed that "*biofuels contribute to rising food prices that adversely affect the poorest*".<sup>169</sup> Land use must focus on food production not biofuels, but the Renewable Transport Fuels Obligation and EU targets will further direct land from food.

52. Where the money goes in the food system is key. The UK position on the Common Agriculture Policy fails to address the fundamental imbalances in the food system. European and UK farming still maintains high levels of support and yet fails to deliver sustainable agriculture, maintain farm incomes or food security. Decoupling of subsidies from production will have some benefits in reducing intensive farming systems but with largest payments still going to the largest farms the UK is continuing to promote large commodity, resource intensive farming supplemented by increased global trade. Past CAP measures have encouraged farm intensification and specialisation which requires investment e.g. in livestock or cereals. Because these systems are not going to be changed quickly, the CAP must incentivise sustainable farming with new measures. High levels of support and protections through tariffs also still affect production decisions, which will inevitably maintain overproduction. The food industry—sugar processing and dairy—still benefit from considerable support in the current CAP which promotes export dumping, and corporate control over the food system.

*What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer taste and habits, and what will be their main effect? What use could be made of local food networks?*

53. Global meat consumption is predicted to double by 2050, but there is simply not enough land or natural resources to sustain this level. Rather than pursue policies to intensify production to meet this predicted demand, policy must instead aim to bring consumption in line with sustainable levels of production.

54. In the UK, poultry consumption has increased because consumers have been sold questionable claims of its health benefits in comparison to red meat. There are negative implications for the environment of this increase, particularly through our reliance on imported soy feed ingredients.

55. Emerging economies have come under scrutiny for their role in the food crisis. Specifically, rising incomes have been linked to increased demand for meat and dairy from China and India. Although demand of animal products from developing countries as a whole is expected to increase significantly, the World Health Organisation (WHO) projects per capita demand for meat products from developing countries to be 38kg per year, whilst for industrialised countries it will be 100 kg per year.<sup>170</sup> The EU and US have historically been consuming many times the level of developing countries.

56. Despite the steady erosion of local food infrastructure resulting from the drive to centralise, there has been a growth in interest in local food, with local food networks flourishing through the transition town movement, farmers' markets and local food growing initiatives. Government must encourage and nurture local food systems, including feed producers, abattoirs, and markets. More support must be directed towards local food networks because of the wider benefits they bring, including supporting local economies and cutting down on transport. There is an important role for public procurement in supporting local food networks.

<sup>165</sup> AIDEnvironment, 2007, Commodity chains, poverty and biodiversity: the case of soy and chicken meat.

<sup>166</sup> Journal of Environment & Development, 2007, Biodiversity and Socioeconomic Impacts of Selected Agro-Commodity production systems.

<sup>167</sup> Joint Nature Conservation Committee, 2006, Global Biodiversity Database Protocol Development—Commodity Linkages.

<sup>168</sup> For example, the IMF estimates that last year biofuels accounted for almost half of the increase in demand for major food crops. The OECD has estimated that between 2005 and 2007, almost 60 per cent of the increase in consumption of cereals and vegetable oils was due to biofuels. The World Bank attributes sixty five cent of price increases to biofuels, suggesting biofuels have endangered the livelihoods of nearly 100 million people and dragged over 30 million into poverty.

<sup>169</sup> Department for Transport, 2008, Review of the Indirect Effects of Biofuels.

<sup>170</sup> See: [http://www.who.int/nutrition/topics/3\\_foodconsumption/en/index4.html](http://www.who.int/nutrition/topics/3_foodconsumption/en/index4.html)

*What role should Defra play both in ensuring that the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

57. Friends of the Earth believes that the UK has a major role to play in ensuring global food security by urgently addressing the UK's use of commodities and global land area.

58. Government must commit to a strong joined-up food and farming policy, with environmental sustainability and social justice at its core. The IAASTD findings must be at the heart of policy on food production and agriculture in the UK and development aid spend. Smaller-scale, more diverse systems must be encouraged, diverting public funds away from intensive, export-led production through the CAP review and other agricultural policy.

59. Defra must take the lead and implement strong policies to improve the sustainability of the food system. Voluntary initiatives are not enough. Government must use its regulatory, fiscal and spending powers to revolutionise the food system to deliver food security and environmental sustainability.

*How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

60. Current cross-Government engagement on food policy is very weak. There is little high-level recognition of the food system's impacts on critical issues such as climate change, biodiversity, public health and inequality, and no high-level endorsement or engagement with the *Food Matters*-initiated strategy for a sustainable food system. *Food Matters*, published by the Cabinet Office in 2008 and hailed as an integrated food policy, was an attempt to develop a coherent cross-Government food strategy. But by focusing mainly on health and climate change it failed to address the sustainability of the food system in its entirety. Although the Strategy Unit's initial analysis of food issues recognised the negative social and environmental impacts of the current system, *Food Matters* failed to follow through with concrete actions to address the identified impacts and make UK consumption sustainable.

61. Defra must work with all departments whose remit has an impact on the food system, including BERR on competition in the grocery sector and to address buyer power; CLG on supporting town centres and retail diversity, and stopping growth in out-of-town stores; DFID on sustainable agriculture and developing domestic and regional infrastructure and markets in developing countries; and the FSA on its advice and labelling responsibilities.

62. The UK Government supported the IAASTD research and signed onto its recommendations. However, it continues to promote free trade and investments in agricultural biotechnology and more intensive farming as solutions to the global food crisis. It also supports undemocratic institutions such as the new "Global Partnership" for food security involving the G8 and agribusiness and excluding developing countries or small farmers' organisations.

*What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

63. The UK requires a huge amount of overseas land to sustain our own consumption. Defra must measure and reduce the UK's impact on global land use, particularly through our use of animal feeds.

64. The strategy for addressing UK food security and sustainability must not result in exporting problems elsewhere nor undermine developing countries' ability to grow food for their own populations. As the livestock system is a "hotspot" due to its impacts on the environment, land use and global food security, specific indicators should be developed to measure and reduce its impact, for example a target for domestic production of feeds.

65. As outlined previously, Friends of the Earth does not believe we will achieve global food security by further intensification of agriculture, but by supporting small-scale production, food sovereignty and agro-ecological systems. To monitor the sustainability of the food system, we recommend the following criteria:

- Global impacts of UK consumption and production patterns.
- Climate change: greenhouse gas emissions from UK consumption, including from overseas land use change.
- Biodiversity and ecosystem services: health of ecosystems and natural resources including water and soils.
- Diversity of seeds, genetic pool.
- Fairness in supply chains and prices for food producers that enable them to earn a livelihood and invest in long term sustainability of agriculture, for example an indicator on farm-gate share of retail prices.

- Diet and food-related nutrition and health, including links between income levels and occurrence of diet-related ill-health, and the number of people worldwide achieving the recommended WHO diet.
- Equity and access to food, not just global availability and production.
- Global environmental and social impacts of UK food companies.

February 2009

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### Memorandum submitted by The Co-operative Group (SFS 71)

#### 1. INTRODUCTION

1.1 The Co-operative Group is the largest consumer-owned business in the UK. It is a diverse commercial organisation, comprising of several significant businesses: food retail, farming, pharmacy, financial services, travel, funeralcare, and legal services. We have 3.2 million members and employ over 80,000 people.

1.2 For the purposes of this inquiry, we will focus on our food retail and farming businesses:

- The Co-operative Food is the largest independent convenience store operator in the UK. It has over 2,200 stores and 12.4 million customers. On the 15 July 2008, The Co-operative Group announced that it had exchanged contracts for the acquisition of Somerfield. The combined food business will operate more than 3,000 grocery stores and generate net sales of £8 billion, making it the fifth largest food retailer in the UK. All Co-operative Societies operating supermarkets and convenience stores are members of the Co-operative Retail Trading Group (CRTG). Through the CRTG, the Co-operative Food sources and supplies the Co-op own-brand range, comprising of some 4,000 lines.
- The Co-operative Farms is the largest commercial farmer in the UK, with over 10,000 hectares of land in ownership in England and Scotland and farming a further 20,000 hectares. We are the largest farming recipient of the Single Farm Payment in the UK. Food from our farm supplies our stores, but varies on the season and location of the farms.

1.3 We approach the inquiry from the unique position of both large food retailer and large commercial farmer and have outlined our response to the Committee's specific areas of interest.

#### 2. SPECIFIC QUESTIONS

*How well-placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, whilst ensuring that such production is sustainable?*

2.1 DEFRA is aware of the potential problems that the UK faces from a food security, sustainability of supply perspective. It has already identified five key areas of policy development to ensure food security at both UK and wider world levels. These are: global availability, diversity of supply, food chain resilience, affordability, safety and resilience. Whilst it is right to identify these workstreams, there are an additional number of issues that must be considered to assess how well-placed the UK is to make the most of its opportunities in greater detail.

2.2 *Genetically Modified Organisms (GMOs)*: The ongoing food security debate cannot be assessed without some reference to GMOs. Genetic modification is an area where we have employed the precautionary principle. Within The Co-operative Food, our aim is to eliminate any ingredients and additives that come from genetically modified crops in our products. Our policy, achieved in 1999, recognises consumer and member concern in this matter. Our own-brand range of food products does not contain any ingredients or additives derived from GMOs.

2.3 We remain reliant on the availability of segregated sources of soya, maize and indeed any other genetically modified crops that may come onto the market. But this approach and consumer choice will be compromised if genetically modified and non-genetically modified food sources are mixed.

2.4 *The dynamics of the political landscape—regulation*: Both our food retail and farming businesses are affected by an increasingly complex legislative landscape. About 90% of the regulation that these businesses are subject to is EU level regulation. Recent months have brought changes to the Common Agricultural Policy through its Health Check—which has meant a revision of the farming business model to accommodate changes, the newly-agreed Pesticides Directive, where it is still unclear as to the effect on the level of agricultural production in the UK, and changes to the Marketing Standards—a very positive development allowing the sale of Class II produce in-store. However, greater coherence in regulatory development would be welcome.

2.5. *The dynamics of the political landscape—devolution:* As a UK-wide business, we operate across four different legislative regimes. Although DEFRA is a UK Government department with the remit of uniting food policy across the UK, both Scotland and Wales are working to develop their own national food policies as of 2008. It will be important to achieve some kind of parity in national food policies across the United Kingdom in order to maintain a stable level of production. One of the reasons for this is because of the different regional climates in the UK. Different regional climates mean that certain areas have specialisms, eg: most seed potatoes are grown in Scotland, because its climate is ideal as a low virus area. The seed potatoes are then planted in fields all over the UK, but potato production in other countries of the UK could be at risk if there is not suitable co-operation across borders and too much control of potato production.

2.6 *Intensive agriculture:* As an impact of climate change, we must be prepared for the risk of more extreme weather. This will have an effect on food production. With correct environmental balance, a focus on more intensive agriculture, and growing crops where they will be protected from the elements of the weather, including in polytunnels or greenhouses (cf: Thanet Earth), should be considered. Intensive agriculture does not have to equal energy-intensive agriculture, particularly if offset by wildlife friendly areas.

*In particular, what are the challenges the UK faces in relation to the following aspects of the supply-side of the food system*

2.7 *Science base:* The Director of the Australian Commonwealth Scientific Industrial Research Organisation (Flagship research)<sup>171</sup> spoke at this year's Oxford Farming Conference. The research concentrates on addressing four major challenges in the agrifood sector: future grains, designed food and biomaterials, breed engineering and quality biosensors. The research is highly sophisticated, but we fear that there is no equivalent in the UK. The lack of significant levels of appropriate scientific research represents a challenge in terms of developing knowledge sharing and transfer amongst countries, and the farming community. The situation in the UK has already been the subject of significant debate, including most recently in the House of Lords.<sup>172</sup>

2.8 As example of this, the quality of soil in the UK has decreased as a result of livestock moving from the east to the west of the UK, and the increased use of artificial fertilizers. The farming community lacks the knowledge required to improve soil quality. This is caused by lack of relevant independent research, and knowledge transfer within the farming community. We would encourage DEFRA as the lead government department in this area, perhaps through the EU, to invest more in independent agricultural research.

2.9 *The provision of training:* The Co-operative Farms offers a sophisticated level of training to its employees. We are part of a DEFRA-funded consortium that advises farmers on the requirements of cross-compliance and on catchment-sensitive farming. All our owned-farms are in government supported environmental schemes (Entry Level Stewardship, some are in Countryside Stewardship Schemes and Land Management Contracts in Scotland). We co-operate with other farmers in grower groups and buying groups. Training is widely offered to the farming community and is not high cost, however it is not mandatory. Organisations may have a role to encourage farmers to take up such training.

2.10 *The way land is farmed and managed:* Replicating the co-operative model of sharing equipment and land management training would work well across the wider farming community. Part of the difficulty is the large number of farmers in the UK, who do not share knowledge and equipment. By sharing equipment, we have restructured our farming business and brought it back into profit.

2.11 *The marine environment:* The marine environment may be overlooked on occasion, in comparison to the territorial environment. We are likely to see rising demand for fish products over coming years. At the same time, fish stocks are under severe pressure. The "industrialisation" of fishing has seen global catches at sea increase fourfold over the last 50 years.<sup>173</sup>

2.12 In addition to over-fishing, by-catch and discards also pose a serious threat to the conservation of fish. If the current marine management system remains as it is, we expect catches to continue to decline on the present trajectory as a function of falling fish populations. We welcome the publication of the Marine and Coastal Access Bill, but support the Royal Commission on Environmental Protection's recommendation<sup>174</sup> for the Government to establish an ecologically coherent network of marine protected areas with 30% of UK waters designated as no-take reserves. Such measures increase fish populations outside their boundaries as numbers of fish build up within reserves, they can migrate to fished areas outside the reserve. Reserves can be important for protecting spawning and nursery sites and an essential element of sustainable fisheries.<sup>175</sup> But we also recognise that there would need to be significant support for fishing communities affected by marine protected areas in the short-term.

<sup>171</sup> Dr Bruce Lee, Director, CSIRO Food Futures National Research Flagship; "Impact from Australia's CSIRO Flagship Research Program", Oxford Farming Conference 2009.

<sup>172</sup> <http://www.publications.parliament.uk/pa/ld200809/ldhansrd/text/90120-0011.htm#09012050000233>

<sup>173</sup> "Silent seas" October 2008, Marine Conservation Society

<sup>174</sup> The Royal Commission on Environmental Pollution's twenty-fifth report "Turning the Tide: addressing the impact of fisheries on the marine environment", 2004.

<sup>175</sup> "Net benefits: a sustainable and profitable future for UK fishing", March 2004, UK Strategy Unit.

2.13 The Co-operative takes fish sustainability seriously and is a member and key supporter of the Marine Stewardship Council (MSC). We operate a strict responsible fish sourcing policy to monitor and control supplies. We do not source fish where the origin or method of catch is unknown, we will never knowingly purchase Illegal, Unregulated and Unreported (IUU) fish nor deal with suppliers implicated in the practices of exceeding quota limits, fishing outside prescribed areas, using banned fishing methods or the capturing and selling of endangered species. All our suppliers are subject to audit and inspection on a regular basis to ensure that the required standards are being met, and we regularly review our fish sourcing policy in view of the latest scientific advice.<sup>176</sup> We have also provided £200,000 of funding to take four UK fisheries through MSC certification in 2009–10.

2.14 It is also worth noting that one of the topics of the Australian Flagship research mentioned above was the modification of grain to produce Omega 3. This has reduced the pressure on fish stocks, which had arisen because farmed fish produces less Omega 3 as it is fed grain rather than fish waste, which is in shorter supply.<sup>177</sup>

*What trends are likely to emerge on the demand-side of the food system in the UK, in terms of consumer tastes and habits, and what will be their main effect? What use could be made of local food networks?*

2.15 Good with Food is the theme of The Co-operative's food retail business. It is a business philosophy that defines the way the business and its people operate. It has generated a passion for the products and also for the business—for product development, for the social goals of the business and for excellent store performance. Through "Good with Food" we have focused on:

- Key category drivers—produce, protein and bakery. Excellence in these categories demonstrates a passion for food, demonstrating we are "Good with Food" with leading edge displays that inspire and excite.
- Ranges that reflect current shopping trends allowing consumers to make healthy choices.
- Regional ranges that reinforce our position as a community retailer.
- A service culture that prioritises the customer.
- In-store communications reinforcing responsible retailing.
- A layout that is clean, bright and uncluttered with space given back to customers and the creation of different zones to enable easier navigation and encourage customers to explore the new ranges.

2.16 This encourages consumers towards a healthy diet allowing and enabling them to become Good with Food. Another exciting aspect of the Good with Food programme has involved developing a close relationship with the farming business to supply products exclusively for our shops. This has provided us with a unique opportunity to present healthy options that also meet customer preferences for locally grown produce with sound provenance.

2.17 We also recognise that as a significant food retailer, we have a responsibility for encouraging and developing certain positive demand-side trends. Analysis of sales data enables us to predict the following demand-side trends for 2009:

- From-scratch cooking and home baking: We offer recipe advice in-store and also through mass mail-outs to our members with healthy-eating and cooking ideas to encourage this trend. There is also a demand for better education in food—how to cook, how to cook with leftovers, how to eat more healthily, how to not waste food. We promote better food education both in-store and on the farm. We have an education project where over 10,000 children have spent structured days on an arable farm seeing how cereals are grown, what we do for the environment and then cook to understand the link to their food. We now have 7 sites set up to offer this on our own and third party farms. Please see [www.co-operativemembership.coop/en/fromfarmtofork/home/](http://www.co-operativemembership.coop/en/fromfarmtofork/home/).
- Trading down from eating out: it is important to offer a range of premium products to encourage and enable customers to do this.
- Less protein: There is a trend towards cheaper cuts of meat, mince and also, more vegetables. In January customers choosing healthier products received double points on all purchases of green dot products. We plan to repeat this three times in 2009. In addition, we are planning to run strong value deals on green dot products all year. Green dot messages are based in approved nutrition claims under the Nutrition and Health Claims Regulation (EC) 1924/2006 plus Omega 3, Wholegrain and 5-A-Day claims and will be applied to any products that meets the strict nutritional criteria and has only green or amber traffic lights.
- British food: Provenance of food is important. We have recently converted all own-brand bacon to British only. Our entire range of own-brand bacon, gammon and fresh pork is now British in an initiative to support UK farmers and to raise animal welfare standards. We have worked with over 300 British farmers to achieve this change.

<sup>176</sup> Ibid.

<sup>177</sup> Dr Bruce Lee, Oxford Farming Conference 2009.

2.18 In addition to demand-side measures, our ongoing engagement with our member customers means that we have developed an Ethical Food Policy based on the responses of over 100,000 member customers to a survey. Our customers told us what they want, and therefore we will continue to develop initiatives in the following areas: Food Quality, Diet and Health, Ethical Trading, Animal Welfare, Environmental Impact and Community.

2.19 Demand-side trends can also be linked to economic downturn. We are aware that the demand for organic food has reduced in the past few months,<sup>178</sup> affecting some of our competitors. However, demand for products from our Fairtrade range, which is the largest of any UK supermarket, have increased over the past year in spite of the economic downturn.

*What role should DEFRA play both in ensuring that the strengths and weaknesses that have been identified? What leadership and assistance should DEFRA provide to the food industry?*

2.20 We believe that it is essential for the interests of both consumers and producers of food to be the responsibility of the same government department. At the moment, DEFRA has an opportunity to promote better joined up working amongst the vast number of stakeholders with an interest in food and the security of its supply. It is also an opportunity for the department to be at the forefront of encouraging, and funding research into the future of food and its security and agricultural needs in the UK.

2.21 We very much welcome the publication of the Food Matters report. This contained a number of valuable and positive recommendations and objectives. However, to date, progressing the recommendations appears to be slow. We are particularly interested in the role of the Council of Food Policy Advisors and await further information on their activities.

2.22 DEFRA must also adopt a leadership role in closer working with both the Food Standards Agency, the Department for Energy and Climate Change and external organisations such as trade bodies, consumer organisation and NGOs.

*How well does DEFRA engage with other relevant departments across Government, with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

2.23 We would expect to see an improved relationship across government departments following the publication of the Food Matters report. The report aims to create a coherent cross-government food strategy for the first time since the Second World War, indicating the importance and need for continued and increased food production across the United Kingdom. However, we consider that there is still some way to go for a coherent, joined-up relationship between DEFRA, the Food Standards Agency and Department of Health, as promised by the Food Matters report.

The Co-operative Group

February 2009

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### Memorandum submitted by the Food Standards Agency (SFS 72)

#### EXECUTIVE SUMMARY

1. The Select Committee's inquiry is exploring the challenges faced by the UK in ensuring we have secure food. Defra's discussion paper "*Ensuring the UK's Food Security in a Changing world*" (July 2008) defines food security as: "*consumers having access at all times to sufficient, safe and nutritious food for an active and healthy life at affordable prices*".

2. The Food Standards Agency's insight on this issue is principally on how changes in global food production and consumption will affect the supply and consumption of food in the UK and therefore present new challenges in ensuring that food is safe. An essential objective of the Food Standards Agency (FSA) is to secure continuous improvements in food safety and also explicitly to retain consumer confidence in food safety.

3. This evidence comments on where the FSA will focus in order to ensure that food safety systems remain robust as patterns of food production and consumption change.

4. The evidence also notes the potential issues which changes in food production may create for ensuring nutritious food. The evidence also describes how the Food Standards Agency interacts with Defra and other parts of government to ensure that food policy is coordinated across government.

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<sup>178</sup> Jay Rayner; "Top stores call them "budget food lines", I say they are a disgrace", The Observer, 18 January 2009.



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## THE FOOD STANDARDS AGENCY

5. The FSA was established in April 2000 as a non-Ministerial UK Government Department, operating at arms' length from Ministers, headed by a Chair and Board, who are appointed to act in the public interest. The FSA is accountable to the Westminster Parliament, through health ministers, and similarly to the devolved administrations in Scotland, Wales and Northern Ireland. It has its own budget, which is negotiated directly with the Treasury.

6. The Food Standards Act 1999 states “the main objective of the Agency in carrying out its function is to protect public health from risks which may arise in connection with the consumption of food (including risks caused by the way in which it is produced and supplied) and otherwise to protect the interest of consumers in relation to food”. The Agency is responsible for assessing and managing risk in relation to food and communicating advice to the public. It is guided by a set of core principles: putting the consumer first; openness and independence; science and evidence-based.

## FOOD CONSUMPTION AND PRODUCTION

7. The inquiry is considering potential demand and supply changes in food over a 40-year period. It may be instructive to consider the extent of changes that have taken place in UK food consumption over the past 40 years. For example the rise of frozen foods in the 1970s, the dramatic increase in the consumption of ready meals and the steady shift towards a greater proportion of meals being eaten out-of-home. Given the breadth of these changes, anticipating the socio-economic and technological changes that will affect food consumption over the next 40 years is complex.

8. There are a variety of other drivers which will determine the nature of any changes in global food production—for example the effect of production subsidies and the impact of climate change on the appropriateness of land and water in different regions for agricultural use. However the principal determinant is likely to remain the economics of market demand.

9. Market demand has prompted considerable innovation and diversification in food production, including the globalisation of food supply and the development of an increasingly complex and multilayered supply chain. Measured by unprocessed value the UK provides around 50% of its own food. Imports are principally from other EU countries (the Netherlands, Spain, France, the Irish Republic and Germany are the five largest suppliers). In total 26 countries account for 90% of the UK's food supply. These range from traditional trading partners, such as South Africa, the USA and New Zealand, to Mauritius, Kenya and Chile.

10. The complexity of food supply chains leads to increased challenges for food businesses in maintaining standards throughout the supply chain and ensuring that sources of products can be traced. As patterns of global production change then new risks for food safety may emerge. As the regulator of food safety, the FSA has to ensure that it has the regulatory and policy framework to monitor and respond to these risks.

11. The following sections describe the food safety risks, considering how those may be affected by changes in food production, and the FSA's response to those risks.

## FOOD SAFETY RISKS

12. The greatest type of food safety risk is food borne disease (principally salmonella, campylobacter, VTEC, listeria and clostridium perfringens). There were an estimated 950,000 cases of food borne disease in 2006. Other sources of risk include chemical contamination, allergens or intolerance and radiological contamination.

13. The FSA dealt with 1,300 reported food safety incidents during 2008. Even where food incidents are not injurious to health, they undermine consumer confidence in food safety, are costly to national economies and unless effectively managed may contribute to an erosion of trust between consumers, regulators and the food industry.

14. Under UK law responsibility for food safety rests with the food business operator. The key requirements are that businesses take responsibility for the safety of the food that they produce, import, pack, transport, store or sell. Food incidents may arise in any stage of the supply chain: at primary production, processing, manufacture or retail, and at the storage and distribution points between each stage. There are also risks for consumers in how they store and prepare food.

15. Around a quarter of incidents originate from outside the EU. In 2008 there was a major incident involving milk and milk products from China contaminated with melamine, which highlights the challenges which arise in managing food incidents from imported goods.

16. Food imports from outside the EU are subject to controls which are different between animal and non-animal products. Animal products may only be imported through designated Border Inspection Points (there are around 20 in the UK). At the posts the product is subject to documentary and physical checks. Non-animal products may be imported through around 80 seaports and airports around the UK. Documentary checks are conducted and a small proportion of products will be subject to additional checks or sampling.

17. The melamine incident arose when melamine, an industrial chemical used in the production of plastic, was added to low grade milk to give the impression of higher protein content. The Chinese authorities estimated that more than 300,000 children were affected by the contaminated milk. The problem spread to the EU through the import of composite products containing milk or milk powder such as chocolate and biscuits. (There has been a long-standing ban on the import of milk and other products of animal origin from China as controls on the food industry in China do not meet the very strict requirements set in the EU).

18. Following the European Commission's policy the FSA worked with the food industry and others to proactively identify possible products which may contain adulterated milk or milk products which may be on the UK market and then to ensure that they were withdrawn from sale. Port health authorities were asked to detain relevant consignments from China pending receipt of laboratory test results.

#### THE FSA'S RESPONSE TO RISKS

19. Changing patterns of global food production will present new challenges for the robustness of the regulatory system. There are a number of measures which the FSA takes to ensure that the risks to food safety are managed effectively.

20. Key to these is the science and research which underpins all of the FSA's activity. The FSA is currently considering its strategic plan for the period 2010–15 and, as part of this, the associated research needs. This will include continuing to build our understanding of how food safety risks arise, for example how campylobacter moves in the food chain. There is also scope for better sharing of research requirements across government and with industry so that where appropriate resources can be shared.

21. An area which the FSA believes merits particularly close attention is food imports. As food businesses respond to changing demand, or economic pressures create requirements for cheaper sourcing, we would expect to see changes in the pattern of imports.

22. Tackling problems with imported foods requires a combination of approaches: continued vigilance at border controls, intelligence-based target surveillance to address illegal activity, promoting food safety in developing countries and raising awareness of existing EU food safety legislation. The lesson to be learned from the melamine incident is not simply one about food risks relating to a particular country. It also highlights that risks may occur in food products where there are commercial benefits to be gained from adulteration of the product to demonstrate a higher level of a particular nutrient.

23. Underpinning all this activity is co-operation nationally and internationally to ensure that risks are identified and managed. The FSA has put in place an incident prevention strategy. This works with industry, local authorities and consumer representatives to reduce the number of incidents by preventative action. Key to this is sharing information and intelligence, based on building trust and partnerships.

24. The FSA plays an active role in the work of the European Food Safety Authority and there are active links and regular exchanges of information with international food safety authorities. These are particularly strong with English-speaking countries such as the USA, Canada, Australia and New Zealand. The FSA is also working with EFSA and the European Commission to improve links with other countries beyond the EU.

#### NEW TECHNOLOGIES

25. The FSA continues to monitor emerging technologies that have developed within the food sector, and the non-food sector, but which could be transferable into the food supply. Areas of potential future development include the use of intelligent packaging to give food safety warnings rather than relying on use by dates, nanotechnology in food packaging to prevent decay and more rapid sampling of food products and detection of food hazards.

26. In all cases it is vital to ensure not only that such new technologies enhance food safety but that the technologies are introduced in an open way to ensure that they have public understanding and support.

27. Future changes in global food production are likely to raise again the question of the use of GM products in the UK. The FSA is responsible for the food safety assessment of Genetically Modified Organisms (GMOs) in the UK. The use of GMOs in food is determined by European Community Regulation (EC) 1829/2003 on GM food and feed which stipulates that GM foods may only be authorised for sale if they are judged not to present a risk to health, not to mislead consumers and not to be of less nutritional value than the foods they are intended to replace.

28. Authorisation of GMOs for use, or cultivation within Europe takes place at a European level. The European Food Safety Authority (EFSA), in consultation with the appropriate competent authority, is required to provide a risk assessment. This assessment includes a detailed consideration of the potential for

toxic, nutritional and allergenic effects. The final decision on authorisation of GMOs is taken by Member States at the Standing Committee on Animal Health and the Food Chain. Nine GMOs have been authorized for use in the past two years.

#### NUTRITION

29. The FSA will also give consideration to how changes in global food production affect its work on nutrition.

30. The Agency has established an integrated nutrition policy programme with the overall aim of making it easier for consumers to choose a healthier diet. The programme seeks to influence both in home and out of home eating occasions. Its strategic targets include reducing population salt and saturated fat intake, contributing to achieving a balance between calorie intake and energy output and encouraging improved nutrition labelling both in store and in restaurants to help consumers make healthier choices. There are three clusters of activity which seek to: influence people's knowledge and skills; encourage businesses to improve the nutritional composition of foods; and foster an environment which promotes healthier choices.

31. To ensure its nutrition policies are based on the best available evidence the Agency allocates significant resources to supporting development of independent expert advice, evaluating the impact of its policies and generating and interpreting dietary research and survey data. This will allow any changes in dietary intakes, which may arise from changes in global food production, to be identified and addressed.

#### FSA AND OTHER GOVERNMENT DEPARTMENTS

32. Food policy has been central to the Government's agenda in the post war period. The recent spike in food prices, the impact of food on health outcomes, food crisis and food scares will continue to ensure that food is a central priority for this, and future Governments. Food policy in England is mainly developed with three Government departments: the Food Standards Agency, Department of Health and Department for Food, Environment and Rural Affairs.

33. The Food Standards Agency has concordats with both the DH and Defra that clarify areas of responsibility. The recently published Department of Health's *Healthy Food Code of Good Practice* and *Food Matters—Towards a Strategy for the 21st Century* further clarify areas of responsibility between Departments.

34. The *Healthy Food Code of Good Practice*, part of the Government's Obesity Strategy for England, establishes seven areas where Government expects companies in every food sector to take action to demonstrate commitment to promoting healthy eating. The FSA is responsible for front of pack labelling, smaller portion sizes for energy dense and high in salt foods, reductions in consumption of the levels of saturated fat and sugar, and nutritional information on food eaten out of the home.

35. The Cabinet Office's *Food Matters—Towards a Strategy for the 21st Century* published in July 2008 recognises the importance of working with all stakeholders to develop a new food policy framework. The report states that continuing vigilance on food safety is one of the four key challenges facing the UK food system. The report identified a number of actions for government. The FSA was identified as the lead department for four recommendations: helping people make healthier choices when eating out; developing a single web based platform for consumer information and advice on nutrition, food and sustainability, and food safety; implementing a whole food chain approach to tackling food-borne illness; analysing the extent to which changes in the market are putting a strain on the regulatory system for GM products. The delivery of the recommendations within the Cabinet Office report is being overseen by the Cabinet's Office Food Strategy Task Force on which the FSA is represented.

36. Defra recently established the Council of Food Policy Advisors to advise Government on food affordability, security of supply and the environmental impact of food production, and contribute to drawing up of the policy for food security and supply expected to be published in 2009. Tim Smith, the FSA Chief Executive, is a member of the Council of Food Policy Advisors.

37. A new Cabinet sub-committee on food, Domestic Affairs (Food), has been formed and the Chair of the FSA, Dame Deirdre Hutton, attends by invitation.

38. Collectively these arrangements allow government policy on food to be joined up effectively. Within that structure the Food Standards Agency believes that it plays an important role, enhanced by its status as a non-ministerial department.

Food Standards Agency

February 2009

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## Memorandum submitted by the Association of Public Analysts (SFS 73)

### 1. EXECUTIVE SUMMARY

1.1 It is almost 150 years since the first overarching legislation protecting consumers from adulterated and dangerous food.

1.2 The Public Analyst Service is a vital resource for society, providing reliable analytical results and expert legal opinion on the quality, safety and probity of food, water and animal feedstuffs, identifying fraud and thereby helping to maintain the public's confidence in its food supply.

1.3 Complex labelling and persuasive advertising are increasing the number and variety of claims being made about foodstuffs. These claims, together with increasing commodity prices and lengthening supply chains are all serving to make the work of the Public Analyst as essential in the future as it has been since 1860.

1.4 The Food Standards Agency is the UK competent body for the implementation and monitoring of feed and food law. Yet it has no direct control over many aspects of food law enforcement, including the provision of laboratory testing services or the sampling activities, as these are delegated in practice to the Local Authorities.

1.5 Local Authorities are required to appoint a Public Analyst and an Agricultural Analyst<sup>179</sup> to help discharge the authority's food and feed control enforcement duties. There is, however, no requirement in law for Local Authorities either to employ a Public Analyst or to provide the appointed Public Analyst with laboratories, equipment or other facilities with which to carry out these duties.

1.6 There is no centrally-coordinated, strategic direction or funding of the UK's official Food Control Laboratories.

1.7 There are no nationally-agreed guideline budgets for sampling and analysis, or targets set for risk-assessed sampling levels, to support this essential food control work.

1.8 The UK food industry is worth about £150 billion annually, yet only £8 million is spent on ensuring the safety of that food through routine food analysis.

1.9 In the view of the Association of Public Analysts, the Food Standards Agency is failing to address adequately the serious decline in the Public Analyst Service, which already poses serious risks to the safety of the public food supply, in terms of both ongoing health & safety issues and its long-term sustainability.

1.10 Thus, one of the greatest strengths of the UK food system could soon prove to be its Achilles Heel, particularly given the increasing globalisation of elements within the supply chain, coupled with lower standards of control elsewhere in the world.

### 2. INTRODUCTION—THE PUBLIC ANALYST SERVICE

2.1 Public Analysts are highly-skilled and experienced scientists whose statutory role<sup>180</sup> is to protect the safety of the public's food supply and, similarly, that of animal feeding stuffs, through the monitoring for and identification of contaminants, illegal additives and misleading or fraudulent labelling. They provide the expert scientific evidence in the legal context necessary for the prosecution of fraud and related cases involving food and animal feeding stuffs. Their primary focus is on the chemical analysis of food, an aspect of food law enforcement which is often overlooked (see, for example, its complete absence from the recent report by the Strategy Unit of the Cabinet Office<sup>181</sup>). Further, in spite of the importance to the human food chain of ensuring the probity of animal feeding stuffs, this area of work receives even less attention. Microbiological investigations relating to food safety are also carried out (particularly in Scotland) by Public Analysts.

2.2 Only individuals possessing the Mastership in Chemical Analysis (MChemA) are eligible for appointment as a Public Analyst. Before embarking on study for this postgraduate qualification, individuals must be professional members of the Royal Society of Chemistry. As such they are subject to a rigorous code of conduct and are required to maintain high standards of competence and ethical behaviour.

2.3 Recent years have seen an increase in the instances of both deliberate and accidental contamination of food. Melamine in milk products of Chinese origin and dioxin in pork and lamb of Irish origin are among the most recent and both are potentially injurious to health. Without adequate enforcement activity, contaminated food can find its way into many different food products. For example, it has been estimated that the cost to UK industry of recalling the 600 different products containing Worcester sauce contaminated with Sudan I from chilli powder, was between £100 million and £200 million. Yet the contamination was discovered in Italy, not in Rochdale where the sauce was manufactured.

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<sup>179</sup> Although separate appointments are made under different legislation, most if not all, Public Analysts are also Agricultural Analysts or Deputy Agricultural Analysts. For simplicity, only the term Public Analyst is used throughout.

<sup>180</sup> See Regulation 36 of The Official Feed and Food Controls (England) Regulations 2006 <http://www.opsi.gov.uk/si/si2006/20060015.htm>

<sup>181</sup> Food Matters Towards a Strategy for the 21st Century (The Strategy Unit July 2008) [http://www.cabinetoffice.gov.uk/media/cabinetoffice/strategy/assets/food/food\\_matters1.pdf](http://www.cabinetoffice.gov.uk/media/cabinetoffice/strategy/assets/food/food_matters1.pdf)

2.4 The Public Analyst Service is a vital resource for society, providing reliable analytical results and expert legal opinion on the quality, safety and probity of food, water and animal feedstuffs, identifying fraud and thereby helping to maintain the public's confidence in its food supply.

3. *How robust is the current UK food system? What are its main strengths and weaknesses?*

*"In some cases the food fraudster can apply highly sophisticated techniques and make it very difficult, if not impossible, for the public to detect that food fraud has occurred. Thus, as part of food fraud control enforcement, there must be an equally sophisticated analytical service to support the food enforcement officer in the field."* (Food Standards Agency, 2008<sup>182</sup>)

3.1 One of the greatest strengths of the UK food system could soon prove to be its Achilles Heel, particularly given the increasing globalisation of elements within the supply chain, coupled with lower standards of control elsewhere in the world. It is 150 years since the first overarching legislation protecting consumers from adulterated and dangerous food.

3.2 Since then the UK has benefited from legislation seeking to monitor and control the safety of the public's food supply. This control has been augmented and, in some instances, superseded by even more rigorous measures under European legislation. Feeding stuffs for animals which form part of the human food chain are also similarly subject to strict legislative monitoring and control. EU Member States are required to ensure that adequate financial resources are available to provide the necessary staff and other resources for official controls.

3.3 The Food Standards Agency is the UK competent body for the implementation and monitoring of feed and food law. Legislation thus requires the Food Standards Agency to ensure that: (a) there is adequate provision of accredited laboratory testing services; (b) there are sufficient qualified and experienced staff to ensure that official controls are carried out efficiently and effectively; and (c) the staff have appropriate and properly-maintained facilities and equipment to ensure that they can perform official controls efficiently and effectively.

3.4 In practice, the Food Standards Agency delegates its legal duties with respect to inspection, sampling and analysis to the (459) Local Authorities throughout the UK. It thus has no direct control over many aspects of food law enforcement, including the provision of laboratory testing services or the sampling activities within the Local Authorities and the costs are viewed as being the financial responsibility of the Local Authorities.

3.5 Shire counties and single-tier Local Authorities are required to appoint a Public Analyst and an Agricultural Analyst<sup>183</sup> to help discharge the authority's food and feed control enforcement duties. There is, however, no requirement in law for Local Authorities either to employ a Public Analyst or to provide the appointed Public Analyst with laboratories, equipment or other facilities with which to carry out these duties.

3.6 Some Local Authorities maintain appropriately-accredited laboratories and in them, Public Analysts and their staff are Local Authority employees. Others, usually through a tendering process, award contracts to one or more laboratories in the public or private sector which may or may not be geographically "close". There are currently two private-sector providers, both of which are international privately-owned companies operating a number of laboratories globally.

3.7 Complex labelling and persuasive advertising are increasing the number and variety of claims being made about foodstuffs. These claims, together with increasing commodity prices and lengthening supply chains are all serving to make the work of the Public Analyst as essential into the future as it has been since 1850.

3.8 There is no centrally-coordinated, strategic direction or funding of the UK's official Food Control Laboratories.

3.9 There are no nationally-agreed guideline budgets (for example, per head of population or per food premises) for sampling and analysis, or targets set for risk-assessed sampling levels, to support this essential food control work.

3.10 Local Authorities view sampling and analysis as an effective tool for food standards enforcement; however, lack of resources is often cited as a reason for carrying out little or no sampling activity.<sup>184</sup>

3.11 Food Standards Agency data show a continued decline in Local Authority sampling rates. Figures presented to the Food Standards Agency Board in February 2008<sup>185</sup> include an element of double counting.<sup>186</sup> Even so, the total number of "samples" for the nine months to December 2007 was 113,968—equivalent to just under 152,000 for the whole year.

<sup>182</sup> The Final Report of the Food Fraud Task Force, September 2007 <http://www.food.gov.uk/multimedia/pdfs/board/fsa070907.pdf>

<sup>183</sup> Although separate appointments are made under different legislation, most if not all, Public Analysts are also Agricultural Analysts or Deputy Agricultural Analysts. For simplicity, only the term Public Analyst is used throughout.

<sup>184</sup> Summary Report on the Focused Audit Programme on Food Sampling in England October—December 2002, FSA 2003 (see <http://www.food.gov.uk/multimedia/pdfs/samplingsummaryreport.pdf>)

<sup>185</sup> See <http://www.food.gov.uk/multimedia/pdfs/board/info090201.pdf>

<sup>186</sup> Paper presented to the FSA Board, March 2008 <http://www.food.gov.uk/multimedia/pdfs/board/info080302.pdf>

3.12 This compares with 181,000 in 2003 and represents a fall of more than 16% over the four years.

3.13 On a *per capita* basis, this is half the number taken in Germany.<sup>187</sup> Eight Local Authorities reported taking no samples during the year 2007-08 and two Local Authorities have not indicated whether they are taking any samples in 2008-09.

3.14 Local Authority sampling activity throughout the UK has fallen by 16% since 2003 (Scotland shows 29.2% drop since 2004-05) and spending on analysis is falling throughout the UK.

3.15 In one large English authority, spending has fallen by 30% in real terms over the past decade and York City Council has cut its spending by a third from last year.

3.16 The average amount spent on food analysis by Public Analysts in England & Wales (excluding London) is 10p per head per year; in some areas it is as little as 2p.

3.17 This compares with 46p<sup>188</sup> in the Republic of Ireland.

3.18 Laboratory closures have occurred in both the public and private sectors. The most recent closure was a private-sector facility in Birkenhead, with the redundancy of two Public Analysts;<sup>189</sup> Aberdeen City Council has postponed for several months a decision on the future of its laboratory;<sup>190</sup> and the future of a public-sector laboratory in England is now also uncertain.

3.19 The number of laboratories has decreased by a third since 1997.<sup>191</sup> There are currently only 41 Public Analysts employed in 21 laboratories throughout the UK. The age profile of the profession demonstrates that a “demographic time bomb” is imminent—more than 60% of those currently employed as Public Analysts are over 50 years of age.

3.20 This decline has come about partly as a result of sampling levels having fallen below the level which would provide the income to sustain laboratories and/or staff.

3.21 Closures of Local Authority laboratories have resulted from decisions taken at a local level for either political or financial reasons.

3.22 For the past three years, the Food Standards Agency has been conducting a “review” of the Public Analyst Service, but this has still not been put to the promised consultation. During this time the Service has continued to decline to a level which already poses serious risks to the safety of the public food supply, in terms of both ongoing health & safety issues with the food supply and also in terms of its longer term sustainability.

4. *How well placed is the UK to make the most of its opportunities in responding to the challenge of increasing global food production by 50% by 2030 and doubling it by 2050, while ensuring that such production is sustainable? In particular, what are the challenges the UK faces in relation to the following aspects of the supply side of the food system?*

4.1 The Public Analyst service has a critical place within the supply side. It has responsibility for monitoring the composition of fertilizers. Through its monitoring of primary agricultural produce it is also able, albeit *post hoc*, to identify environmental quality or contamination issues.

5. *What trends are likely to emerge on the demand side of the food system in the UK, in terms of consumer tastes and habits, and what will be their main effect? What use could be made of local food networks?*

5.1 The public is already increasingly demanding of information about the source and composition of the food it purchases and consumes, with rising concerns about authenticity. Readily-available foodstuffs (both original and processed) are increasingly varied, showing great variety in compositional requirements, additives, contaminants, genetically modified foods, irradiated foods. The public are being encouraged to protect their health by eating more sensibly.

<sup>187</sup> Second FAO/WHO Global Forum Of Food Safety Regulators <http://www.fao.org/docrep/meeting/008/ae167e.htm>

<sup>188</sup> Based on figures obtained following a Freedom of Information request, April 2008

<sup>189</sup> See <http://www.liverpoolecho.co.uk/liverpool-news/local-news/2008/08/23/100-jobs-go-from-factory-100252-21590182/>

<sup>190</sup> See <http://www.pressandjournal.co.uk/Article.aspx/848908>.

<sup>191</sup> House of Commons Written Answers

[http://www.publications.parliament.uk/cgi-bin/newhtml\\_hl?DB=semukparl&STEMMER=en&WORDS=public%20analyst&ALL=&ANY=&PHRASE=%22public%20analyst%20%22&CATEGORIES=&SIMPLE=&SPEAKER=&COLOUR=red&STYLE=s&ANCHOR=90126w0051.htm\\_spnw6&URL=/pa/cm200809/cmhansrd/cm090126/text/90126w0051.htm#90126w0051.htm\\_spnw6](http://www.publications.parliament.uk/cgi-bin/newhtml_hl?DB=semukparl&STEMMER=en&WORDS=public%20analyst&ALL=&ANY=&PHRASE=%22public%20analyst%20%22&CATEGORIES=&SIMPLE=&SPEAKER=&COLOUR=red&STYLE=s&ANCHOR=90126w0051.htm_spnw6&URL=/pa/cm200809/cmhansrd/cm090126/text/90126w0051.htm#90126w0051.htm_spnw6)  
and

[http://www.publications.parliament.uk/cgi-bin/newhtml\\_hl?DB=semukparl&STEMMER=en&WORDS=public%20analyst&ALL=&ANY=&PHRASE=%22public%20analyst%20%22&CATEGORIES=&SIMPLE=&SPEAKER=&COLOUR=red&STYLE=s&ANCHOR=90112w0039.htm\\_spnw1&URL=/pa/cm200809/cmhansrd/cm090112/text/90112w0039.htm#90112w0039.htm\\_spnw1](http://www.publications.parliament.uk/cgi-bin/newhtml_hl?DB=semukparl&STEMMER=en&WORDS=public%20analyst&ALL=&ANY=&PHRASE=%22public%20analyst%20%22&CATEGORIES=&SIMPLE=&SPEAKER=&COLOUR=red&STYLE=s&ANCHOR=90112w0039.htm_spnw1&URL=/pa/cm200809/cmhansrd/cm090112/text/90112w0039.htm#90112w0039.htm_spnw1)

5.2 Already, on average one in five (20%) of food samples tested in the UK each year attracts an adverse report as a result of either labelling or compositional faults.<sup>192, 193</sup>

5.3 The Public Analyst service had, by 2003, declined to such a level that it had been a real challenge for it to respond appropriately to the Sudan I incident.<sup>194</sup>

5.4 At the end of 2008, one large UK Port Health Authority had to contact laboratories throughout the country to find one able to carry out analysis for melamine in Chinese foods in a timely manner.

5.5 All these demand-side pressures will increase going forward and there is nothing to suggest that in the UK or globally, economic drivers will serve to do anything other than increase the risks of sophisticated food fraud in pursuit of profit. The activities of the Public Analyst service will, therefore, become even more crucial to public health and safety. As currently resourced, however, it could prove extremely difficult for the Public Analyst service to react to any major new food scare. Within five years, it will be impossible to provide the country with the analytical services to enable it to meet its statutory obligations with respect to food control and enforcement.

6. *What role should Defra play both in ensuring the strengths of the UK food system are maintained and in addressing the weaknesses that have been identified? What leadership and assistance should Defra provide to the food industry?*

6.1 Defra should further encourage the food industry to review the appropriateness of its spending on advertising and promotion of food and drink, which increased by 19% between 2003 and 2007 (from £704 million to £838 million).<sup>195</sup>

6.2 Separately, it might encourage the Treasury to consider, in the interests of improving the overall health of the nation through the continued monitoring of the safety and nutritional quality of the food supply, imposing a modest tax levy on such promotional spending. By way of example, a 1% tax levy on the £838 million spent in 2007 would yield £8.38 million. This would be sufficient to fund centrally-coordinated, strategically planned UK-wide food inspection and sampling activity, while also removing this financial burden from Local Authorities and enabling them to spend their own revenue on appropriately locally-accountable work in, for example, local small manufacturers and suppliers, pubs, restaurants etc.

7. *How well does Defra engage with other relevant departments across Government, and with European and international bodies, on food policy and the regulatory framework for the food supply chain? Is there a coherent cross-Government food strategy?*

7.1 Defra is represented on the Food Standards Agency and although a cross-Government food strategy is emerging, any such strategy will fail if appropriate measures are not in place to ensure the underlying sustainability of the service which provides the means to control and enforce existing legislation with respect to the quality and safety of the food supply.

8. *What criteria should Defra use to monitor how well the UK is doing in responding to the challenge of doubling global food production by 2050 while ensuring that such production is sustainable?*

February 2009

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#### Submission from Prof Jonathan D G Jones FRS (SFS 74)

1. Food production capacity with current technology is struggling to keep up with demand; this situation will persist. Climate change and its implications for water supply will make this struggle more difficult. The expanding middle class in India, China and elsewhere is demanding more meat, which is inefficiently produced from grains. We need to consider that due to drought and desertification elsewhere, moist and warm northern Europe may have an increasing responsibility to contribute to world food supply, and that food supplies on world markets for the UK cannot be relied upon.

2. Agriculture, whether organic or conventional, has a huge impact on the environment. If we wish to promote biodiversity, we need dedicated areas of extremely productive agriculture (especially for cereals), enabling us to set aside other areas in which biodiversity can thrive.

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<sup>192</sup> A summary of samples reported in West Yorkshire in the quarter to December 2008 can be found on the WYJS website <http://www.wyjs.org.uk/wyjs%20committee%20reports/aats/020209/final-agenda-public.pdf>, page three onwards

<sup>193</sup> The FSA published a study of samples submitted to Public Analysts in 2000–01 <http://www.food.gov.uk/multimedia/pdfs/samplesanalysts.pdf>

<sup>194</sup> Report of the Sudan I Review Panel. FSA, July 2007 (Recommendation 5) <http://www.food.gov.uk/multimedia/pdfs/sudanreview.pdf>

<sup>195</sup> Changes in food and drink advertising and promotion to children. A report outlining the changes in the nature and balance of food and drink advertising and promotion to children, from January 2003 to December 2007. *Department of Health, October 2008*. Section 1—Overall food and drink advertising. See [http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_089129](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_089129)

3. A major contribution of science and technology to crop productivity is genetic improvement. Recent advances in DNA sequencing methods create unprecedented opportunities to accelerate breeding via “genomics”. Furthermore, GM methods can also improve yields. However, these methods are not being fully deployed by the private sector in the UK because returns on investment are too low. To make the most of current and anticipated technology for crop improvement, an enhanced role for the public sector is required. This needs to be taken forward in a private/public partnership with support from the industry. Wheat is a prime example of where more public investment could be extremely productive. The farm gate value of wheat is ~ £1.5 billion/yr, yet wheat seed sales earn only ~ £60 million/yr and royalties to seed companies are ~ £14 million/yr. Monsanto anticipate that by combining GM with marker-assisted selection to accelerate breeding, they will double maize and soy yield by 2030. We could do the same in wheat, creating £1.5 billion/yr in value, but not if we rely on the investment to come through the royalty income to the four UK private breeders (~ £3.5 million/yr each). Private breeders are also concerned by the lack of public sector activity, because most of their breeders are over 50, and the public sector is not training new breeders. Public breeders less focused on short-term returns would broaden the genetic base of crops, and take forward GM solutions to major diseases such as take all of wheat. We also would recreate synergy of basic plant science and plant breeding, facilitating translation and capture of value created by excellent UK plant science expertise and discoveries.

4. Public sector plant science is currently supported across multiple ministries, such as DEFRA, DFID and BBSRC (DIUS). This effort does not appear to be sufficiently “joined up”. Recruitment by DFID of BBSRC peer review expertise sets a good precedent; DEFRA should consider this model for funding top quality science in research areas relevant to a food security mission. The US National Plant Genome Program provides a good example of the value created by effective inter-agency cooperation for a common goal.

5. Support for science cannot be switched on and off like a tap as political fashions change; it is essential for commitments to be sustained, though of course with quality control to ensure sustained performance. The BBSRC one-off funding round after crop science review was welcome but is insufficient and does not constitute a program.

6. The UK government must stand up determinedly for GM crops. If Austria can defy EU rules and ban GM crops, then the UK could (and should) defy EU rules and declare that we no longer need EU permission to evaluate GM crops and plant any that we find beneficial. Blight-resistant potato and Roundup-resistant sugar beet are available now, and would be good for the environment and would reduce crop production costs, contributing to lower food prices at time when incomes are being squeezed. We should also undertake a major testing program of private and public GM genes in a new national crop improvement program, focusing initially in wheat on disease resistance, and nitrogen and water use efficiency.

March 2009

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**Memorandum submitted by Kian Tavakkoli and Lulu Jiang (SFS 77)**

**MITIGATING CLIMATE CHANGE THROUGH FOOD POLICY: THE LIVESTOCK CONNECTION AND SOLUTION**

**INTRODUCTION**

*“Evidence on health and the balance of environmental analysis suggests that a healthy, low-impact diet would contain less meat and fewer dairy products than we typically eat today” Cabinet Paper, Food Matters, Towards a Strategy for the 21st Century, The Strategy Unit, July 2008*

It is now widely acknowledged that climate change is already a planetary emergency. The Intergovernmental Panel on Climate Change, (IPCC), Fourth Assessment Report reviewed and analysed a large body of scientific evidence that has put the truth of human-induced climate change beyond any doubt. Numerous researches published after the deadline for this last assessment reveal that global warming is in reality happening much faster, stronger and sooner than the IPCC 2007 forecast (WWF 2008). According to the Chairman of the panel, Dr Rajendra Pachauri, *“If there is no action before 2012, it is too late. What we do now in the next 2-3 years will determine our future. This is the defining moment.”*

This proven acceleration of climate change calls for even more rapid and ambitious mitigation and adaptation responses. However, there is one crucial piece to the puzzle that has received less than its due share of attention from the scientific and political world. This paper summarises some major research works that evidence the undeniable close connection of livestock production to climate change, as well as to some other global issues.

The purpose of this paper is to highlight the collective and mounting evidence on livestock’s damaging impact on our planet and our health, with the hope that your invaluable input will help to inform the public about the full impact of meat production and also to help influence Government strategy as a priority, at a national and international level.



## 1. GREENHOUSE GAS EMISSIONS

The Cabinet paper, Food Matters, states that the food chain, particularly farming, is a large contributor to global GHG emissions. The Government's Chief Scientific Adviser is commissioning a major new study to examine how the global food system needs to evolve in a world adapting to, and mitigating climate change. In the UK, about 18% of GHG emissions are related to food production and consumption. Nearly half of these emissions come from farms, mostly in the form of methane and nitrous oxide that fall outside current UK domestic targets for carbon dioxide (Strategy Unit 2008).

When talking about greenhouse gas emissions, emphasis has mainly been put on carbon dioxide. Rightly so, given that it is the most abundant greenhouse gas in the atmosphere. However, methane, the second most important greenhouse gas, has shown some disproportionately rapid increase in recent human history: global methane has risen by 148 per cent over 255 years from 1750, while carbon dioxide emissions have increased by 35 per cent over the same period of time (IPCC 4th Assessment). Taking into account that methane is a much more potent greenhouse gas, especially within a shorter timescale—25 times the global warming potential (GWP) of carbon dioxide over a 100-year period, and 72 times GWP of carbon dioxide over 20 years (IPCC 4th Assessment)—its sharp increase could have a devastating impact on this planet.

Research has shown that the melting of the permafrost and subsequent release of methane is a “ticking time bomb”. Frozen bubbles in Siberian lakes are releasing methane at rates that appear to be “five times higher than previously estimated.” The release of methane could create an uncontrollable feedback effect, dramatically warming the atmosphere, which would in turn warm the land, lakes and seabed, further melting the permafrost and releasing more methane. Once that threshold is reached, there will be nothing humans can do. (Walter *et al* 2007). A 10 year study at the University of Alaska, USA has shown that a two or three-degree Celsius increase in Arctic temperatures could melt the permafrost, releasing its stored gases into the atmosphere and leading to uncontrollable runaway global warming (Ping *et al* 2008).

The fast release of methane into the Earth's atmosphere 55 million years ago caused rapid warming and mass extinction of species, disrupting the climate for more than 100,000 years. Another catastrophe, 251 million years ago, came close to destroying nearly all life on Earth due to the release of methane (Atcheson 2004).

The very quality of methane that makes it so damaging also points to a quick and effective way to halt global warming—by significantly reducing anthropogenic methane. However powerful it is, with a net life cycle of 8.4 years in the atmosphere and a reduced global warming potential in longer time frames, any reduction in methane could quickly translate into alleviation of the warming effect.

It has been established that the livestock industry is the single largest producer of methane, responsible for 37 percent of global anthropogenic methane emissions. It is also by far the largest emitter of Nitrous Oxide (65 percent), the third most important GHG with 296 times GWP of carbon dioxide over 100 years, or 275 times GWP of carbon dioxide over 20 years (FAO 2006).

The whole livestock production chain also contributes to 9 per cent of anthropogenic carbon dioxide emissions, primarily due to land use changes for feed and animal production and fossil fuel use during animal, feed and fertiliser production (FAO 2006).

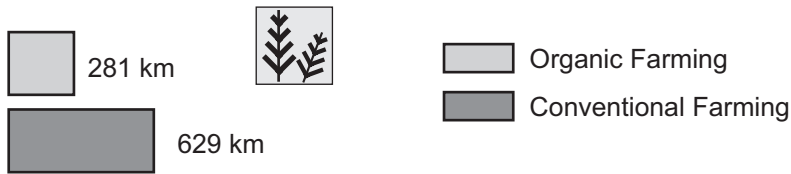
Overall, the greenhouse gases produced by the livestock sector account for about 80 percent of the emissions from agriculture and nearly one fifth (18 per cent) of total greenhouse gas emissions from human activities (FAO 2006). This is calculated over a 100-year period and the figure does not take into account transportation, refrigeration in transport or the amount of energy used at home for storing meat.

One research comprehensively evaluated the effect of greenhouse gas emissions of three types of diet: an omnivorous diet including meat, dairy and plant foods; a vegetarian diet containing dairy and plant foods; and a vegan diet containing only plant-based foods (Foodwatch 2008).

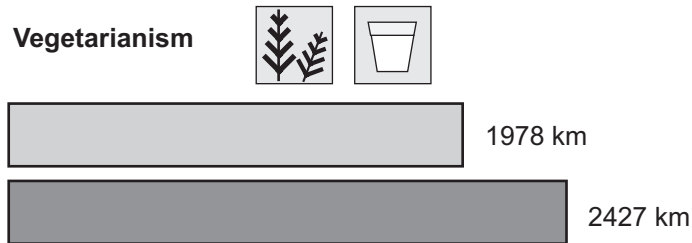
### Agriculture as Climate Killer

Greenhouse effect from different kinds of eating habits, per capita and per annum, presented in car kilometers\*

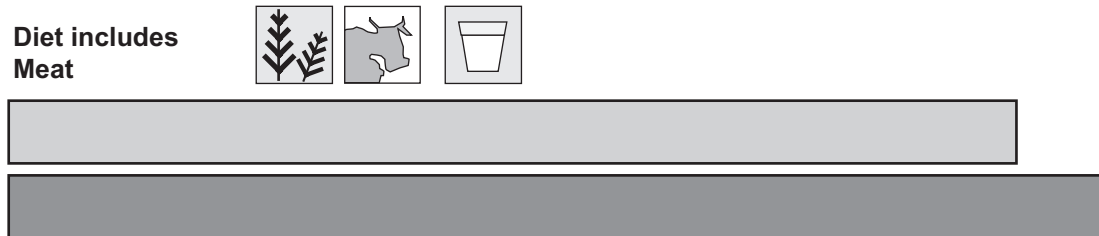
#### Veganism



#### Vegetarianism



#### Diet includes Meat



\* equivalent to the CO2 emissions of a BMW 118d with 119g CO<sub>2</sub>/km

Source: Foodwatch

The study shows striking differences between the three diet categories in terms of their contribution to greenhouse gas emissions. It is also interesting to note that even an organic meat-based diet creates seven times the emissions of a non-organic vegan diet.

Another paper shows that adopting a meat-free diet for just one day a week in the UK would save 13 megatons of carbon dioxide emissions. This is a greater carbon saving than taking 5 million cars off the roads in the UK (10.4 megatons of carbon dioxide), and almost equivalent to replacing one billion light bulbs with low-energy ones (van Beukering *et al* 2008).

## 2. ENERGY CONSUMPTION

Meat production is very energy intensive. It is estimated that producing one calorie of animal protein requires more than 10 times as much fossil fuel input as does one calorie of plant protein (Pimentel and Pimentel 2003). The production of just 1 kg of beef consumes 40 mega calories of energy, and emits greenhouse gases with a warming potential of 36.4 kg of carbon dioxide, equivalent to the amount of CO<sub>2</sub> emitted by an average European car running every 250 km. Over two-thirds of the energy goes towards producing and transporting the animals' feed (Ogino *et al* 2007).

## 3. DEFORESTATION

Every year, 17 million hectares of tropical rainforest is destroyed (RIC). Seventy per cent of the Amazon's deforestation is due to making pasture land for cattle, and a large part of the remainder is used for feed crops (FAO 2006).

Forests play a key role in mitigating climate change. Apart from storing carbon, they store water, generate rainfall, act as a climate buffer, stabilise the soil, maintain biodiversity and much more (GCP). Decimating them for pasture has a very high environmental cost. Every year about 2.4 billion tons of carbon dioxide is released into the atmosphere as a result of deforestation for the purpose of livestock maintenance (FAO 2006). And it doesn't stop there, by year 2010 cattle are projected to be grazing on some 24 million hectares

of neo-tropical land that was forest in 2000 (FAO 2006). Hence, the declaration signed by 300 climate experts at the 2007 United Nations Conference in Bali says: *“If we lose the forests, we lose the fight against climate change.”*

#### 4. LOSS OF BIODIVERSITY

In 306 of the 825 terrestrial eco-regions identified by the Worldwide Fund for Nature, livestock are identified as “a current threat”, while 23 of Conservation International’s 35 “global hotspots for biodiversity”—characterized by serious levels of habitat loss—are affected by livestock production. The International Union for Conservation of Nature (IUCN) estimates that species loss today is 1,000 to 10,000 times higher than the expected natural extinction rate. Livestock production is a major culprit, contributing to all the most important direct drivers of biodiversity loss, such as habitat change, climate change, invasive alien species, and pollution (FAO 2006).

Tropical forests hold half of the world’s species and many have become or are becoming extinct at an alarming rate due to deforestation that are largely driven by meat production. A few species of animal raised for meat and milk now account for about 20 per cent of the total terrestrial animal biomass, and the population of these few species is still growing ‘invasively’. *“The sheer quantity of animals being raised for human consumption is a threat to the Earth’s biodiversity”* (FAO 2006).

Raising animals for the production of meat is also responsible for 64 percent of global Ammonia emissions (FAO 2006), contributing to acid rain and affecting biodiversity.

The current rapid loss of biodiversity is a cause of grave concern. The IUCN has warned that life on Earth is disappearing fast and will continue to do so unless urgent action is taken.

#### 5. LAND AND WATER USE

Much of the world is running out of water. Over 1 billion people worldwide do not have access to clean water. More than 2 billion people do not have proper sanitation. The UN Food and Agriculture Organization (FAO) estimates that by 2025 there will be 1.8 billion people living with absolute water scarcity and 2/3 of the world’s population could be living under water-stressed conditions (FAO 2006).

Meat production, particularly the production of feed, consumes large amounts of critically important water resources (FAO 2006). A report presented to the UN in May 2008, ‘Saving Water: From Field to Fork’ shows that 70 per cent of global fresh water is used in agriculture, and the rest is split between household (10 per cent) and industry (20 per cent) (SIWI and IWHI 2008).

Research indicates that to produce the same amount of food, water required for items such as meat and dairy is 10 times that of items such as grains and vegetables. For example, to produce 1 kg of beef uses 5,000–20,000 litres of water. In comparison, to produce 1 kg of wheat uses only 500–2,000 litres of water (SIWI and IWHI 2008). In the case of the United States, the contrast is even greater: producing 1 kg of animal protein requires about 100 times more water than producing 1 kg of grain protein (Pimentel and Pimentel 1996).

A similar situation exists with land usage. Meat production uses about 20 times more land than would be required to produce the same amount of grains and vegetables. It has been estimated that one hectare of land could produce enough potatoes to feed 22 people for a year, or enough rice to support 19 people for a year. But if used to produce lamb, the same area of land can only support two people for a year, or can only feed one person for the same period if used to produce beef (WHO and FAO 2003).

Furthermore, meat production not only uses the majority of agricultural land (70 percent), which is 30 percent of the Earth’s entire land surface (in the UK, the livestock sector uses up to 65% of agricultural land [Strategy Unit 2008]), but also renders land infertile for years due to overgrazing, compaction and erosion. Seventy percent of all grazing land in dry areas is considered degraded (FAO 2006).

The livestock industry is also the largest sectoral water polluter. The main polluting agents are animal waste, antibiotics, hormones, chemicals from tanneries and pesticides used on feed crops. Animal waste plays a major role in polluting rivers and streams. More than 2 billion tons of animal manure was produced in the late 1990s. Assuming an average nitrogen content of around 5 per cent, this allows 100 million tons of nitrogen finding its way into our water systems. The Livestock industry is unquestionably *“among the most damaging sectors to the Earth’s scarce water resources”* (FAO 2006).

Global population is expected to reach 8.1 billion by 2030. Fourteen percent more fresh water would be required for agricultural purposes in order to keep pace with the growing demand for food (FAO News 2007). But even now, on a global basis, the amount of fresh water available per person is falling rapidly (UNEP 2002).

The livestock industry is the single largest user of land and water, and a major cause of wide-scale land degradation and water pollution (FAO 2006). Earth’s limited and diminishing reserves of land and water cannot sustain the needs of a growing population. Yet, much of these two precious resources are still used for, and damaged by, the raising of 58 billion livestock every year (FAOSTAT).

## 6. WORLD HUNGER

*“The world will need farming systems capable of feeding 8–11 billion people well before 2050 within a resource-light, low-carbon economy. The necessary progress towards this outcome will not happen of its own accord.”*—Cabinet paper, Food Matters

According to the UN FAO, there are more than 963 million people in the world who do not have enough to eat. Hunger claims 25,000 lives every day, among them, over 17,000 children (WFP Hunger Stats). On the other hand, 760 million tons of grain are fed to animals every year (FAO Food Outlook). During 2007–08, 36 per cent of the global grain utilised was to feed animals, whilst 47 per cent was used for feeding humans, and 5 per cent used on bio-fuel (FAO Crop 2008). During the same period about 70 per cent of the global soya consumption was in the form of animal feed whilst only 16 per cent was used for humans (USDA Review 2008).

Farm animals are naturally inefficient converters of plants to edible flesh because much of their food is converted into energy for movement, excreted as manure, or used for the growth of body parts not eaten by people. Statistics show that it takes more than 10 kg of grain to produce 1 kg of beef, 4 to 5.5 kg of grain to produce 1 kg of pork, and 2.1 to 3 kg of grain to produce 1 kg of poultry meat (USDA AgStats 2008). This is based on net live-weight production of meat. If measured by consumable ready-to-cook weight, the ratio would be even higher. And cattle excrete 40 kg of manure for every kg of edible beef produced (Ottawa 1995).

*“Livestock consume more edible human protein than they produce”* (FAO 2006). Diverting the critically needed grain from cattle to humans could help the world’s hungry population get their share of food. Raising animals for human consumption is one of the major causes of world hunger (EVANA).

## 7. HEALTH

The onset of many meat-related diseases, which can be fatal, such as Mad Cow Disease, Blue Tongue Disease, Bird flu, Pig’s Disease (PMWS), Listeriosis, E Coli and Salmonella have been a cause of increased concern, questioning the safety of eating meat. Meat recalls around the world are becoming more frequent with millions of pounds of meat found to be contaminated. The Cabinet paper, Food Matters, states that deaths due to Listeria are rising and meat contamination is a continuing challenge as is the threat of diseases transferring to humans from animals.

Meat consumption is related to many prevalent diseases. Animal protein found in meat, dairy and eggs, is strongly linked to high blood cholesterol levels, which is a predictor of heart disease and many cancers. Research has shown that when the intake of plant food is increased, blood cholesterol levels go down. Cow’s milk, which is deficient in iron, has in some studies been correlated with an increase in childhood onset diabetes. Many studies have consistently shown that dairy intake is linked to prostate cancer, whilst the formation of kidney stones and osteoporosis have also been linked to diets high in animal protein (Campbell 2004). Dr Colin Campbell, chief US investigator of the China Study advises: *“No chemical carcinogen is nearly so important in causing human cancer as animal protein.”* The World Cancer Research Fund also recommends reducing the consumption of red and processed meats in its 2007 report, stating that they are a convincing cause of colorectal cancer (WCRF and AICR 2007). According to World Organisation for Animal Health (OIE), 60 per cent of human pathogens and 75 per cent of recent emerging diseases, including tuberculosis, are zoonotic (Vallat 2005).

Medical costs attributable to meat eating are substantial. The Physicians Committee for Responsible Medicine in the USA estimated that between \$29 billion and \$61 billion spent in healthcare in 1992 can be linked to meat consumption, adding that the cost would likely have been higher if stroke and other arterial disease had been studied as well (Barnard, Nicholson and Howard 1995). In the UK, around 70,000 fewer people would die prematurely each year if diets matched the nutritional guidelines on fruit and vegetable consumption, saturated fat, added sugar and salt intake (Strategy Unit 2008). Diet-related ill health costs the NHS £6 billion each year (Rayner and Scarborough 2005). Globally, the World Health Organisation has issued the following figures: *“Low intake of fruit and vegetables is estimated to cause about 31 percent of ischaemic heart disease, 11 percent of strokes worldwide and 19 percent of gastrointestinal cancers. Overall, 2.7 million deaths are attributable to low fruit and vegetable intake”* (WHO 2004).

A vegetarian diet prevents meat-related diseases and can reverse some of them. The American Dietetic Association and Dieticians of Canada have reported that vegetarians show lower blood cholesterol levels, lower blood pressure, lower rates of hypertension, type 2 diabetes, and prostate and colon cancer. Vegetarians have been reported to have lower body mass indices than non vegetarians, as well as lower rates of death from ischaemic heart disease (ADA 2003). A 30 year study has demonstrated that coronary atherosclerosis can be reversed through comprehensive lifestyle changes, including a vegetarian diet; and more recently, a randomized controlled trial showed that comprehensive lifestyle changes may stop or reverse the progression of prostate cancer (Ornish *et al* 1998). The American Journal of Clinical Studies has also published studies showing the benefits of a vegetarian diet in the prevention and treatment of type II diabetes as well as having a significant impact on cardiovascular disease (Jenkins *et al* 2003).

A vegan or vegetarian diet is appropriate for all stages of life, including during pregnancy, lactation, infancy, childhood and adolescence (ADA). Other benefits of a vegetarian diet are cited as higher levels of carbohydrates, fibre, magnesium, potassium, folate, and antioxidants such as vitamins C and E and

phytochemicals. In summary, both the American Dietetic Association and Dieticians of Canada confirm that planned vegetarian diets are healthful, nutritionally adequate and provide health benefits in the prevention and treatment of certain diseases.

Reducing or eliminating animal products from our diet has major health benefits, will save billions of dollars in healthcare costs and is the quickest, most effective way to curb global warming.

## 8. FUTURE GROWTH AND SUBSIDIES

The world's meat consumption has increased five fold in comparison to the 1950s. By 2050, global meat consumption is expected to more than double the 1999 level—from 229 million tons to 465 million tons, while dairy output is expected to nearly double from 580 million tons in 2001 to 1,043 million tons in 2050. The number of animals slaughtered per year will increase from 60 billion to 120 billion in 2050 (FAO 2006).

The meat industry is a significant contributor to greenhouse gases and a main cause of climate change. And yet, the global livestock sector is growing faster than any other agricultural sub-sector. The expected increase in the consumption of meat and dairy highlights the grim possibility of continuing environmental devastation and the FAO warns: "*The environmental costs per unit of livestock production must be cut by one half, just to avoid the level of damage worsening beyond its present level*" (FAO 2006).

Despite the meat industry's very real threat to the planet and its inhabitants, huge subsidies are given to the industry every year: the sum of the EU's interventions and direct support to the livestock industry in 2007 was over 3.5 billion Euros. This figure does not include the financial aid given to meat producers for marketing their products (Holm and Jokkala 2007). This kind of subsidy exists in many countries, including the US.

If the meat industry fulfils its predicted growth, with staunch monetary support from governments, the environmental consequences will be apocalyptic as described by some scientists.

## 9. SOLUTIONS

Many steps are being taken to curb climate change all over the world, such as the use of renewable energy, eco friendly cars and aeroplanes, recycling and planting trees, to name a few. Even the meat and dairy industries are moving to reduce their environmental footprint through less packaging, improving fuel efficiency, reducing water use, etc. Clearly, all of these are very important and much needed. Yet, even collectively, they are not sufficient to resolve the environmental crisis we are facing now, within a short time frame, if we continue to raise billions of animals for human consumption. Increasing scientific evidence points to the fact that animal agriculture is literally stripping our planet of its finite resources whilst emitting to the atmosphere potent greenhouse gases and pollutants; its devastating effect on many eco-systems could ultimately destroy our planet and our civilisation as we know it, if we allow the status quo to continue.

Dr Drew Schindell, Atmospheric Physicist at NASA Goddard Institute has stated: "*Control of methane emissions turns out to be a more powerful lever to control global warming than would be anticipated*" (NASA Goddard 2005). The US Environmental Protection Agency also highlighted in its report that "*The mitigation of non-carbon dioxide (Non-CO<sub>2</sub>) greenhouse gas emissions can be a relatively inexpensive supplement to CO<sub>2</sub>-only mitigation strategies.*" "*Methane Mitigation has the largest potential across all the Non-CO<sub>2</sub> Greenhouse Gases*" (EPA 2006).

Given the high percentage contribution of livestock production to global methane emissions, logically, reducing meat production and encouraging individuals to move towards a plant-based diet to reduce or eliminate meat consumption would appear to be the quickest, most effective solution. The reasons being:

- The turnover rate for ruminant animals is 1–2 years while the turnover rate for cars and power plants, etc, can be decades. Decreases in meat consumption would result in almost immediate drops in methane emissions.
- Methane cycles out of the atmosphere in about eight years, while carbon dioxide can stay in the atmosphere for more than a century. Again, lower methane emissions will quickly translate to cooling of the Earth.
- The introduction of new techniques and further research into cutting methane emissions from livestock can take many years.
- A cut in carbon dioxide involves fighting powerful and wealthy business interests while vegetarian foods are readily available—at every meal time.

Hence, a reduction in the size of the livestock industry through reduced consumption is presented as the most effective way of reducing potent GHGs from animal agriculture (Mohr 2005).

It is also proved to be the most economical way. A more recent study found a global food transition to less meat, or even a complete switch to plant-based protein food could wipe US\$20 trillion off the cost of fighting climate change. Hence, dietary changes could play an important role in climate change mitigation policies (Stehfest *et al* 2009).

To achieve this mass transition, it is most important to educate the public about the health risks of eating meat and its direct link to global warming, and to impress upon the Government the true economic and environmental costs of the meat industry and the urgency for fundamental changes. Among many practical measures, the most talked about include:

- Introduction of an environmental tax on meat.
- Diverting huge subsidies from meat production to supporting organic, plant-based agriculture (NEIC).
- Provision of vegetarian meals in schools and hospitals.

## CONCLUSION

*“Human beings and the natural world are on a collision course... Fundamental changes are urgent if we are to avoid the collision our present course will bring about.”* The Union of Concerned Scientists warned us (UCS, 1992). Nearly 17 years later, we finally realise that we are under a very real threat from climate change and have only a short few years to address the crisis for which we are all responsible.

We can no longer afford to not make these fundamental and urgent changes. In addition to adopting renewable energies, reforestation programmes and other measures to cut carbon emissions, we have to use the methane lever to buy some valuable time for the carbon reduction to take effect. The food chain has huge environmental impacts. Reducing the food chain’s GHG emissions must be a priority in keeping with a policy on curbing climate change. A transition towards a largely plant-based diet shows to be a truly sustainable, effective solution, as well as being a healthy option, beneficial in many ways to the individual and to the economy. Around the world, many governments, officials, scientists, and some religious organisations are speaking out about the urgency and effectiveness of a significant reduction in meat production and consumption (Annex 1).

The public is largely unaware of the link between meat consumption and its full environmental devastation and detrimental health impact. They are unaware of the short time left to avoid catastrophic climate change leading to mass extinctions. At times of global emergency they look to the Government to take the lead and to advise them accordingly. The people will follow what governments propose, especially if it is good for them and necessary for planetary survival.

At this time of planetary emergency, we need our governments and international institutions to legislate change, to lead the way and to be an example as individuals and as a government. Based on scientific data and facts we need our leaders and institutions to make vital policy changes and to facilitate these changes as quickly as possible in many ways. People must be made aware of the dire consequences that await all of us if fundamental changes are not made urgently.

We look to you, in a position of authority and significance to help provide the much needed impetus for individuals and policy makers to make these vital changes.

*March 2009*

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**Annex 1****REDUCING MEAT CONSUMPTION AS A WAY TO CURB GLOBAL WARMING**

*IPCC, Dr Rajendra Pachauri, Chairman*

*“Please eat less meat; meat is a very carbon-intensive commodity... This is something the IPCC was afraid to say earlier, but now we have said it.”*

<http://www.theglobeandmail.com/servlet/story/RTGAM.20080122.wcomment0123/EmailBNStory/International/home>

*“Don’t eat meat, ride a bike and be a frugal shopper. That’s how you can help brake global warming.”*

<http://www.abc.net.au/news/stories/2008/01/16/2139349.htm?section=world>

*NASA, Dr James Hansen, Top world climatologist*

*“... the things that individuals can do are helpful, and one of the most helpful is actually a vegetarian diet, produces much less greenhouse gasses than a meat diet.”*

<http://www.whirledpeas.com.au/this-i-get-hansens-climate-logic-and-the-vegetarian-diet/>

*UN, Yvo de Boer, Executive Secretary of Framework Committee on Climate Change*

*“The best solution would be for us all to become vegetarians.”*

<http://www.enn.com/pollution/article/34572>

*UN, Henning Steinfeld, Chief of the FAO’s Livestock Information and Policy branch*

*“Livestock are one of the most significant contributors to today’s most serious environmental problems. Urgent action is required to remedy the situation.”*

<http://www.fao.org/newsroom/en/news/2006/1000448/index.html>

*Australia, Senator Andrew Bartlett*

*“There is no easier, cheaper and more immediate thing we can do to significantly reduce our personal contribution to greenhouse emissions than to cut the amount of meat and dairy products that we consume.”*

<http://sl.farmonline.com.au/news/nationalrural/agribusiness-and-general/general/senator-bartlett-wants-nomeat-and-dairy-day/83604.aspx>

*Estonia, Digestive Gases Tax*

Estonia introduced a ‘digestive gases tax’ in 2008 to compensate for the greenhouse gas that cows produce during their life.

[http://www.russiatoday.ru/Art\\_and\\_Fun/2008-05-12/Estonia\\_cracks\\_down\\_on\\_cows\\_discharge.html](http://www.russiatoday.ru/Art_and_Fun/2008-05-12/Estonia_cracks_down_on_cows_discharge.html)



*Korea, Senator Gang Gi Gap, Labour Party Leader*

Democratic Labour Party leader and Senator Gang Gi-Gap has called for a switch to a plant-based diet. *“In the case of the meat diet, a comparatively great deal of CO<sub>2</sub> gas is generated from animal raising as well as the excretions of animals, and this amount is extremely serious. So, at least starting now, we humans need to make a great change in our lives.”* 22 September 2008

[http://www.suprememastertv.com/bbs/board.php?bo\\_table=sos&wr\\_id=294&goto\\_url=&sc=&page=&url=](http://www.suprememastertv.com/bbs/board.php?bo_table=sos&wr_id=294&goto_url=&sc=&page=&url=)

*Sweden, Jens Holms, MEP*

*“We should abolish meat subsidies, let meat bear its own environmental costs and work to make modern vegetarian food cheaper.”*

<http://www.nutritionecology.org/news/personalities.html>

*Taiwan*

In April 2008, under the auspices of a campaign titled ‘No Meat No Heat’, around a million people in Taiwan—including the speaker of parliament, the environment minister, and the mayors of Taipei and Kaohsiung—vowed to never again touch flesh nor fish.

<http://www.guardian.co.uk/commentisfree/2008/jun/19/food.environment>

*UK, Jonathon Porritt, Chair of the UK government’s Sustainable Development Commission*

*“The increase in meat consumption suddenly looms as one of the biggest environmental crises that we are now facing.”* [http://www.ciwf.org.uk/includes/documents/cm\\_docs/2008/i/impact\\_of\\_livestock\\_farming.pdf](http://www.ciwf.org.uk/includes/documents/cm_docs/2008/i/impact_of_livestock_farming.pdf)

*UK, Professor Tim Lang, City University*

*“We must transform ourselves from being passive consumers to active consumers. We need to lobby government for change, eat less meat and fewer dairy products, and garden more ... and we need to relearn the gardening skills we’ve lost as a nation.”* <http://www.telegraph.co.uk/earth/earthnews/3353377/Government-advisor-eat-less-meat-to-tackle-climate-change.html>

*UK, Caroline Lucas, Leader of Green Party, MEP*

*“It’s vital that, as a society, we eat less meat, both to cut emissions and out of respect for animal rights”* <http://www.vegsoc.org/environment/suggestions.html>

*US, Paul Watson, Former Sierra Club Director and Greenpeace Co-founder*

*“You can change your light bulbs, buy a hybrid car and plant more trees till the cows come home, but nothing is as effective, available, inexpensive, quick, powerful for the individual in affecting global warming as the choice of where to stick your fork.”* [http://www.cincinnati-oh.gov/cmgr/downloads/cmgr\\_pdf18280.pdf](http://www.cincinnati-oh.gov/cmgr/downloads/cmgr_pdf18280.pdf)

*Christian Vegetarian Association UK (CVAUK)*

A meat-free diet has distinct advantages for human health, enables a more just use of environmental resources, and eliminates the suffering of animals bred, raised and killed for food... The adoption of a caring, healthy, violence-free vegetarian diet can be a means of creating a more peaceful society.

<http://www.cvauk.homecall.co.uk/page2.html>

*Jewish Vegetarians of North America*

The way animals are treated on farms today violates Jewish teachings... Becoming vegetarians is the best thing we can do for the environment.

<http://www.jewishveg.com/jv.html>

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**Memorandum submitted by Dr Donal Murphy-Bokern (SFS 79)**

Summary

1. This submission concentrates on the science base which I understand the Committee is now taking a particular interest in.

2. The growth in yield in agricultural crops world-wide is slowing and is now lower than the growth in population. This is one of the fundamentals that indicate that the food crisis is not temporary. Primary agricultural production (crops and forages) will need to approximately double by 2050. A significantly different scenario involves either drastic cuts in the consumption of livestock products in the developed countries or continued dietary poverty in the developing world (or a combination of both). This presents a challenge for research investment world-wide.

3. The main focus of this submission is the effect of the research management mechanisms used and the profound implications of changes in research management within Defra. An account of the development of Defra's approach to the management of agricultural research is provided. It is concluded that the research management mechanisms now used by Defra are suited to investing in relatively short-term research that is tightly focused on current policy questions and on environmental monitoring. This decentralised research management approach presents special challenges for investment in strategic agricultural research needed to underpin longer-term technical change and innovation required to address food security.

4. Proposals for the future are made. Special attention needs to be given to identifying strategic public research needs in terms of coherent research targets and key capabilities that serve a range of policy outcomes. The public agricultural research effort needs to be rebuilt and reconfigured, parity of esteem for researchers conducting and delivering applied research needs to be restored, and we need to replace "funding" with "investment". A natural tendency for most interested parties to look at the volume of investment should be complemented by the Committee's consideration of the public sector research management mechanisms used.

BACKGROUND

5. I am a general agricultural scientist working independently in the space between science and public policy development. I have a broad agricultural science and economics background with a career that spans farming in Ireland, the development and delivery of farmer-owned research in the north of England, research work in the German Ministry of Agriculture, and work in Defra. In addition to supporting research groups with insight into public research policy, I am embedded as a policy/delivery specialist in several research teams across Europe. I am also involved in studies of the environmental performance of the UK food system from a global perspective.

6. In relation to the Committee's interest in science, my most relevant experience arises from my close involvement in the development and management of the Defra agricultural research programme between 1999 and 2007, including 18 months as Defra's first Farming and Food Science Coordinator working in an acting capacity. I was therefore closely involved in the direction of Defra's agricultural and food research effort, and in the changes in research direction and management following the formation of Defra. I was Defra's assessor on the Defra Research Priorities Group and I am familiar with how Defra responded to its recommendations. I am familiar with the UK agricultural science base and the challenges facing it.

7. Before going into detail, I want to record my high regard for Defra as a policy making body. I can assess it from a perspective of having worked in two other European countries. From that experience I regard Defra as a world-leader in environmental and forward-looking agricultural policy. I believe that Defra is a very professional organisation and well ahead of other European agricultural departments in addressing the links between agriculture, food and the environment. There is a deep commitment in Defra to public service and to policy based on evidence.

*Growth in global crop yields is slowing*

8. Other submissions will have set out the evidence that the "food crisis" is not just temporary. I want to briefly underscore that here. Recent developments in food markets are at least partly due to underlying and fundamental trends in the demand and supply of food that are here to stay. The risk of a modern food crisis was noted in the then Ministry of Agriculture, Food and Fisheries (MAFF) as far back as 2000, and research and debate about future levels of production was initiated.<sup>196, 197</sup> This risk was mentioned in Defra's

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<sup>196</sup> Defra research project report: Yields of UK crops and livestock: physiological and technological constraints, and expectations of progress to 2050.(CTE0207)—IS0210.  
<http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=11508>

<sup>197</sup> BCPC Forum on "Enhancing Eco-Efficiency in Agriculture: The agenda for the Future?"—IS0217  
<http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=12662>

assessment of future research needs in 2004.<sup>198</sup> Analysis of FAO data shows that the rate of growth in the yield of staple crops has declined from 2–3% in the 1960s to 0–1% today while the rate of growth of the human population is about 1.4%. In contrast to the situation up until about 2000, the rate of growth of the human population now exceeds the rate of growth in crop yields. In addition, the global demand for resource demanding livestock products is increasing. A combination of growth in population and changes in diet means that primary agricultural production (crops and forages) will need to approximately double by 2050. A significantly different scenario involves either drastic cuts in the consumption of livestock products in the developed countries or continued dietary poverty in the developing world (or a combination of both).

#### *Increased research investment is needed*

9. The growth in agricultural output world-wide to meet growing demands to date has been enabled by a significant agricultural research effort after 1945. There has been a decline in public agricultural research globally since about 1985, particularly in the developed economies.<sup>199</sup> This has happened in the UK too where, in addition to cuts in spending, the public good nature of agricultural knowledge and technology has been under-estimated and the ability of the private sector to deliver knowledge and technology has been over-estimated. It is sometimes forgotten that the great step changes in agricultural science in the 20th century were the product of public investment delivered mostly into the public domain. The momentum in knowledge and technology supply generated in the period 1945 to 1985 combined with the lag-time built into the agricultural knowledge supply chain has delayed the manifestation of the effects of cuts in investment over the last twenty years. It can be argued that that period of living off the intellectual and technical capital built up over the previous forty years is now ending.

#### *Managed public sector agricultural research has contracted in England and Wales*

10. Throughout the developed world, particularly in Europe, national governments have withdrawn from strategic agricultural research, particularly in research institutes. What is left is an increasing proportion of fundamental research that uses agricultural species as models, and an array of private sector activities. This fundamental research is particularly footloose in Universities. In the UK, particularly England and Wales, the combination of cuts in public investment in agricultural research, changes in Defra's approach to research management, the over-estimation of the ability of the private sector to compensate for cuts, and the lower rewards given within and by the research community to investigators who deliver solutions to practical problems have contributed to the condition of UK agricultural research today. Some of the underlying forces leading to this situation can be traced to changes in MAFF and Defra since about 1980. Following two decades of decline in budgets, changes between 2001 and 2004 to the research in Defra effectively closed what was left of the centrally and scientifically led strategic agricultural research programme that had formed the core of the UK agricultural research effort up to that point. So before considering options for the future, it might be useful to examine what happened in MAFF and especially Defra over the last thirty years.

11. Until about 1970, UK scientists and policy makers lived in parallel universes under the principles for the public financing of research laid down by Lord Haldane in 1918. The fact that a large proportion of the UK science budget is still governed by these principles ninety years later says something about the value of Haldane's principles and the resilience of the scientific community in the face of change. Some real change came in the early 1970s brought about by Lord Rothschild who considered the growing role of science in policy making in the "white heat of technology" era. Lord Rothschild reported to parliament that "*the country's needs are not so trivial as to be left to the mercies of a form of scientific roulette*".<sup>200</sup> This led to the transfer of a significant part of the UK research budget from the research community (i.e. the Research Councils) to individual government departments.

12. Lord Rothschild was clear that the job of leading and managing research investment in a government setting was not a trivial one. He stipulated that government departments accepting research funds from the Research Councils to be administered for the benefit of specific sectors of society (e.g. agriculture) should set up dedicated science management capabilities led by departmental Chief Scientists. MAFF implemented this fully and maintained and directed a strategic research capability of world-wide significance under its Chief Scientific Advisor and Chief Scientists. Successive Chief Scientists, supported by a broad team of in-house scientists in the Chief Scientist's Group (CSG), led the conversation between the research community and policy makers, both in relation to the financing and direction of research on one side and harnessing of scientific evidence in the making and delivery of policy on the other. The CSG was outward looking engaging as scientists with the wider expert and external user communities. The word "Liaison" was built into all its scientists' job titles. For the first decade after the Rothschild reform, MAFF management of the research effort was light-handed by today's standards. It was informed and monitored by external expert input at the programme level.

<sup>198</sup> Defra (2004) Evidence and innovation: Defra's needs from the sciences over the next 10 years.

<sup>199</sup> Falcon, W P and Naylor, R L 2005. Rethinking food security for the 21st century. *American Journal of Agricultural Economics*

<sup>200</sup> Report of *The organisation and management of Government R&D*, in *Cabinet Office, A framework for Government Research and Development*, London, HMSO, November 1971 (The "Rothschild Report").

*The development of the gap between strategic and applied research*

13. The MAFF research effort was subject to radical cuts in the 1980s. MAFF responded strategically informed by an internal review led by Mr Chris Barnes (the “Barnes Report”). This identified the “near-market” part of the MAFF research effort that the industry could be expected to pick up in line with Treasury policy at the time. This introduced a boundary between underpinning strategic research and the down-stream applied research and development needed to ensure delivery to users. To my knowledge, the boundary between research to be funded by MAFF and by the industry (for example through the Levy Bodies) was not precisely defined. However, MAFF to its credit engaged in a significant liaison effort which continues to this day to manage and often lead research investment at that boundary. MAFF also established and managed LINK Programmes that provided a platform for public investment in research owned and led by the private sector straddling public and private interests. However, the cutting of “near-market” research investment inevitably left a very long and dark shadow in MAFF and Defra.

14. Market failure provides the rationale for public intervention at the working level. In that context, the “near-market” debate left a legacy of a widely held assumption at the working level that near-market research would be picked up by industry. In other words, it was assumed that “near-market” research is not subject to market failure because it is concerned with marketable, or potentially marketable, technologies and services. This faith in the ability or inclination of the private sector to invest in “near-market” research was fostered untested by the Treasury. This led to under-investment in some research areas and a growing gap between the MAFF research base and the private sector effort required for its exploitation.<sup>201</sup>

*The fragmentation of ownership of the MAFF research programme*

15. Until about 1991, the MAFF research budget was held centrally in MAFF. The Programme as a whole was led and managed by the Chief Scientist and a Group of about 100 staff—the Chief Scientist’s Group (CSG). About half of the CSG staff comprised scientists trained up to PhD level, senior members had brought broad experience in practical research, agriculture and related businesses from outside making the CSG a significant scientific and expert resource in its own right. In about 1991, ownership and ultimate control of the bulk of the MAFF’s R&D was passed from the CSG to senior policy administrators in MAFF split in 20 to 30 programmes, each aligned to one of the Ministry’s policy programmes. Administrators leading these policy programmes were policy customers for the corresponding research programme. The research continued to be commissioned by scientists in CSG under the “double lock” arrangement which tried to attribute equal weight to the views of CSG scientists and the respective policy owner. The relationship between CSG research managers and their research policy customers was collegial and equal and the system worked well. This success was due in large part to the active engagement of the Chief Scientist. He was broadly familiar with the content of programmes and, crucially, he line-managed the scientists running these programmes and in providing scientific advice to policy colleagues. More detailed research administration and evaluation procedures were introduced in the early 1990s to reinforce a customer-contractor relationship with research providers using the so-called ROAME<sup>202</sup> system.

*The fragmentation of the management of the Defra research programme*

16. This independent and influential position of the CSG in MAFF with a centralised “intelligent customer” function was the focus of a great deal of attention when Defra was formed in 2001, especially since it came with a ring-fenced research budget. It contrasted with the DETR’s<sup>203</sup> decentralised approach with individual policy makers owning and managing individual research projects focused on very specific policy questions. At first, the two approaches ran in parallel. An internal debate about the future management of the Defra research effort as whole followed the appointment of Sir Howard Dalton as the new Chief Scientific Advisor (CSA) in March 2002. Having considered the evidence that emerged in that debate, Professor Dalton initially favoured the use the centralised (MAFF) approach across Defra. However, an “integrated approach”, which turned out to be a stepping stone to a fully decentralised model, was adopted starting in 2003–04. Responsibility for the ownership, resourcing, direction and procurement of agricultural research was decentralised to policy teams. Most of the ex-MAFF scientists previously managed by the Chief Scientist/CSA were also dispersed into policy teams. About a year later, the financial ring-fence protecting Defra’s research budget from financial pressures within the Department was breached.

17. Behind the decision to opt for the decentralised approach lay some legitimate concerns that the formal separation of research direction from policy leaves the science effort vulnerable to capture by other forces. It was seen as vulnerable to being distracted away from the policy agenda by either the research community or by narrow agricultural sectoral interests (or both). So the strategic R&D investment serving the improvement of the environmental and economic performance of English and Welsh agriculture ceased to exist in its own right and is now part of wider (“cross-cutting”) efforts serving policy objectives that go

<sup>201</sup> Defra research report ST0158. The role of future public research investment in the genetic improvement of UK grown crops <http://scienceresearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=10412>

<sup>202</sup> Rational, Objective, Appraisal, Monitoring, Evaluation.

<sup>203</sup> Department of Environment, Transport and the Regions.

well beyond agriculture and food. So the taxonomy of the (reduced) agricultural research effort now mirrors the taxonomy of the wider public policies that that the research is supposed to support. The direct coupling of research programmes with individual policies means that the flap of a butterfly's wing in policy development or even just in the way policy is communicated by ministers can cause a storm in research prioritisation, particularly when using the bottom-up processes described below and when exposed research budgets are at stake. A spending moratorium was used to accelerate the change in direction of research programmes.<sup>204</sup> Another followed to address Defra budget problems. In a Full Economic Cost recovery world, direct exposure to the vagaries of Departmental budgets can do great damage to key research resources arbitrarily and at short notice. "Decentralisation" had numerous far-reaching implications for the management of research at the working level.

18. Responsibility for identifying and prioritising the research "owned" by the farming and food part of Defra was delegated to committees comprising policy makers from right across Defra responsible for climate change, water, food, and farming systems and biodiversity. The idea was to link the farming and food research effort to Defra's wider objectives and to cultivate support across Defra for Defra's investment in agricultural R&D. It is noteworthy that the agricultural and food part of the Defra research effort was the only part of the Defra research portfolio subjected to this form of cross-departmental governance of research. These committees were inclusive of a wide range of policy staff at the outset with varying levels of experience and interest in agriculture. Decision-making processes had a strong "bottom-up" character. Unanimous support for research spending plans at the project level was required. These committees found it difficult to give priority to strategic under-pinning research essential to the long-term progress of agriculture over shorter-term research more tightly focused on specific current policy questions. The challenge was such that Defra had to procure more external analysis to inform investment decisions in this environment.<sup>205</sup>

#### *Leading and delivering agricultural research in the future*

19. There is a Europe-wide trend of government departments withdrawing from the active direction and use of research. Given the role governments have had in investing in agricultural research over the last 60 years, the effects of this withdrawal from research is most clearly manifest in agriculture. We see an increasing proportion of fundamental research that uses agricultural species as models, and an array of private sector activities. This research is particularly footloose in Universities. Although the food and financial crises have reminded us of the role of agriculture in the health of the economy, we may assume that European national governments will not return to their previous role as leading investors in agricultural research through their departments.

20. So we need new structures and partnerships for the direction and delivery of public agricultural research that reconsider the public good nature of the knowledge and technology outputs required. By "public good" I mean research outputs that are largely in the public domain and whose consumption is non-rival. In designing new systems to direct and deliver research based technical change, I propose four essential ingredients:

- The identification of strategic public research needs in science terms.
- The rebuilding of the public agricultural research effort.
- The restoration of parity of esteem for applied research.
- The need to "invest in", instead of "fund," research.

These are set out in detail as follows:

#### *The identification of strategic public research needs in science terms*

21. The recognition of the public good nature of agricultural knowledge and technology is a prerequisite to an orderly debate about public investment in agricultural research. This knowledge and technology is a public good in itself which is used to protect and enhance public goods though enhancing the environmental and productive performance of agriculture. The public good nature of the agricultural research community's outputs has been under-estimated and the ability of the private sector to deliver knowledge and technology has been over-estimated. It is sometimes forgotten that the great step changes in agricultural science in the 20th century were the product of public investment and were based largely on knowledge and technologies delivered into the public domain.

22. It is very plausible to argue that the way to get researchers to better serve public policy objectives is to frame their work in line with those objectives. This is also attractive because it avoids the difficult job of interpreting current and future policy needs in terms of coherent research objectives. But this tram-lining of research onto policy causes fragmentation and duplication, and in the end many inaccessible research

<sup>204</sup> Select Committee on Science and Technology Fourth Report  
<http://www.publications.parliament.uk/pa/cm200607/cmselect/cmsctech/68/6808.htm>

<sup>205</sup> Defra project report IF0101: The rationale for Defra investment in R&D underpinning the genetic improvement of crops and animals  
<http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=14403#Description>

outputs delivered too late. This was found by Defra itself in an internal study in 2003 to characterise policy led research. Three things need to be kept in mind in identifying coherent research investments to serve policy. First: researchers deliver knowledge and understanding, not policy. Second: policy-makers rarely operate on timeframes compatible with those needed to identify and deliver strategic research objectives in time to support those policies. Third: policy-makers rightly respond to the political vision of the day which, particularly in the area of agriculture and the environment, is often developed later than the underlying real-world forces driving that vision.

23. The recent EU sponsored crop research priority setting exercise (EUROCROP)<sup>206</sup> emphasised the importance of identifying coherent science facing research targets that cut across the wide range of public and private objectives that should drive that research. Their thorough work showed that some areas of research core to agricultural science remain relevant across a wide range of policy scenarios and over time. This points to the need to translate present and future policy and market conditions into coherent research programmes. This involves a degree of “intelligent decoupling” of policy (public or commercial) and research objectives which is hard but rewarding work that adds great value in the research investment process.

#### *The rebuilding of the public agricultural research effort*

24. In implementation of research investment, the recent emergence of the Agricultural and Horticultural Development Board offers an opportunity. There is a case for the AHDB playing a significant role in the direction and management of publicly funded agricultural research to support the technical change required to deliver Defra’s policies, integrated with its existing research focused on its more commercial objectives. The recruitment of a Chief Scientific Advisor by the AHDB provides an opportunity to rebuild and reconfigure the public agriculture research effort in such a way that unifies the public agricultural research effort across the UK and even beyond.

#### *The restoration of parity of esteem for applied research*

25. In the UK, a researcher who addresses questions of practical significance to wider society is usually regarded as less able or less worthy of peer recognition than one who addresses research questions defined by him/herself or by scientific peers. This has done great damage to the effectiveness of the UK agricultural science base in terms of socio-political outcomes. Thanks to Lord Haldane, a change here is in the gift of the research community itself. This lack of parity of esteem has profound consequences for the behaviours in the research community affecting the efficiency of the research effort in terms of public policy outcomes. Agricultural science draws on the basic sciences to serve society through the bringing together and application of those sciences in frameworks serving agricultural practice and decision making. It is important that the agricultural scientific community restores a sense of purpose in supporting technical change in agricultural practice and policy development. We need to stop using agricultural species and agricultural activity to justify fundamental research which deep down is not being pursued to improve those species and activities. Research models used in an agricultural development context need to support agriculture, not the other way round.

26. Systems—and interdisciplinary-thinking are essential. Much of what passes as interdisciplinary research is in fact a loose and temporary alliance between separate disciplines—there is a lot of multi-disciplinary activity, but relatively little interdisciplinary thinking. This seems to be a particular problem in England and Wales, and is getting worse as we see the effects of the shift towards reductive science since 1990 come through. There is a scarcity of people in research who appreciate the systems or strategic context of their research and who design research programmes around the needs of the system and the needs of the research user. Likewise in research management, there is a scarcity of people who have practical experience of agricultural research and who have the wider experience required to orientate policy objectives into coherent research investment, particularly in the long-term. These skills need more nurturing and more reward.

#### *The need to “invest in”, instead of “fund” research*

27. There is a “funding” and “funded” mentality running right through the system. “Funding” provides a convenient backdrop to cuts. It is much easier to cut a “funding” programme than it is to cut an “investment” programme. Likewise, managing “funding” bears less responsibility than managing “investment”. The “funding” system has also focused researchers on securing project funding at the expense of contributing objectively to public debate on research direction, and public returns to research investment. So the words “funder” and “funding” are a curse to the research community in its broadest sense, especially to users—ie policy-makers, industry and farming.

<sup>206</sup> <http://www.eurocrop.cetiom.fr/index.php?id=11086>

28. So my last point is the need to completely change the mindset of those who finance and deliver research. The mindset in the public research community that public bodies “fund” and researchers are “funded” damages both. It results in a mutually harmful donor/donee relationship and mentality which does not foster a focus on returns to society. Embedding the consideration of the public financing of research as an investment would have benefits for both the researchers and the public bodies that support them. An “investor” will consider consequences in terms of lost returns to previous investment before terminating financing or compromising a capability. The consideration of the finance as an investment would also focus financing organisations on delivering a return to society and would reinforce the need to design research portfolios accordingly. Likewise on the research provider side, the realisation that the flow of finance is an investment would focus researchers’ minds on the responsibility of delivering returns.

#### CONCLUSION

29. The recent food crisis is not a temporary phenomenon. Public agricultural research programmes need rebuilding world-wide. The research management approaches used in Government can have profound effects on the direction and effectiveness of the resulting research and the policy outcomes achieved. In considering the condition of the UK science base, the Committee might consider the effect of changes that were made to the management Defra research in recent years, in addition to consideration of the effects of cuts in investment since 1985.

*Dr Donal Murphy-Bokern,*

*May 2008*

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