



# UK Cross-Government Strategy for Food Research and Innovation - Progress Report 2011



# **The UK Cross Government Strategy for Food Research and Innovation**

## **Progress Report**

### **1. Introduction**

The UK Cross Government Strategy for Food Research and Innovation was published in January 2010 and provided, for the first time, an overarching government framework for food research and innovation across the UK.

The Strategy recognises the strong benefits of a more coherent and coordinated approach on these issues across the public sector, and with industry and other bodies, and sets out actions to achieve this.

A little over a year later, this report reviews the progress that has been made.

### **2. Food Research Group/Partnership**

The Strategy was developed by a cross-government Food Research Group (FRG) chaired by the Government's Chief Scientific Adviser, Sir John Beddington. The FRG includes representatives from all Government Departments funding food research and innovation as well as the Devolved Administrations in Scotland, Wales and Northern Ireland. The FRG links with senior representatives and experts from industry, the research community and others outside government, through the Food Research Partnership (FRP). Over the past year both groups have supported delivery of the Strategy, including addressing key cross-cutting issues such as those highlighted below.

### **3. Skills & Capacity**

#### **a. High-Level Skills for Food**

An assessment by the FRP of 'High-Level Skills for Food' was published in January 2010. This reviewed the available evidence on high level skills issues in the agri-food sector, against the backdrop of anecdotal accounts of existing problems. The study also considered the impact of current measures and identified future priorities.

The study concluded that the supply of high level skills in the agri-food sector is at least sufficient to satisfy current demand, but there is very little accurate data exploring the future demand for high level skills in individual sectors. The changes in the Higher Education Institutes (HEIs) are not seen to have disadvantaged the supply of graduates and higher level skills to the industry or research base, but have led to the loss or reduction of some specialist capabilities in the HEI sector. There are also some niche areas of concern in the very high skill levels required to maintain the research base and support key future agricultural research.

Key recommendations include:

- The Department for Environment, Food and Rural Affairs (Defra) and the Biotechnology and Biological Sciences Research Council (BBSRC) to support the Agri-Skills Forum in its work to develop a co-ordinated approach to understanding and addressing the skills supply and demand issues in agriculture and food, and promoting the further professionalisation of all components of the sectors including high level skills.
- Developing clear, common metrics, with input from the industry and the supply sector and agreed across government which are implemented consistently by all bodies collecting and collating the data. This will be essential in addressing the skills supply and demand issues in the agri-food sector.
- Revisiting the classification of land-based studies by the Higher Education Funding Council for England and its removal from the list of strategically important and vulnerable subjects list; and considering whether the wider agri-food skills area is receiving appropriate funding based on its comparative strategic importance compared to other areas such as STEM subjects.

A cross-Government working group with members from the sector skills councils (Lantra, Improve) is ensuring that recommendations are taken forwards in the context of other initiatives.

For example, Defra, the Department of Business Innovations and Skills and the Department for Energy and Climate Change are working to identify the skills which will be needed to support the transition to a strong and sustainable green economy and to identify government policies driving (or inhibiting) this transition. As part of this initiative, Defra is considering potential new collaborative actions by the food industry and associated bodies that can help deliver an improvement in skills and help the farming and food sector meet the challenges of the future.

#### **b. Advanced Training Partnerships (ATP)**

Another key recommendation of the Skills study was the development by the BBSRC of Advanced Training Partnerships, to address very high level skills needs in the agriculture and food sectors.

The ATP scheme, with up to £15M funding, will support the development and delivery of postgraduate training over five years through partnerships between consortia of organisations, including universities, agricultural colleges and other research institutions, as well as, supermarkets, levy bodies, private research organisations and the farming community among others. Twenty Outline Applications were received, of which nine were invited to submit Full

Applications. Of these nine applications, four have been proposed for award (subject to certain conditions), covering a broad range of areas, including livestock, crops, food science, horticulture and agricultural systems. The awards are due to be announced in early May.

**Doctoral Training Partnerships – [www.bbsrc.ac.uk/dtp](http://www.bbsrc.ac.uk/dtp)**

The BBSRC has recently launched its new Doctoral Training Partnerships (DTP) competition, which will support PhD studentships across its remit with an increased emphasis on strategic priority areas (this includes both broad and 'niche' research skills relevant to food). To support these new partnerships BBSRC also funds collaborative PhD training with industry (including in areas relating to food) through its CASE schemes.

**North Wyke Platform** – The BBSRC is undertaking major multi million pound investment on a new farm platform at North Wyke research, part of Rothamsted Research. The aim of the platform is to address issues of food security, agri-ecosystem function and climate change, at a farm scale, using the latest sensing and analytical systems alongside high capacity data management systems. This will allow the manipulation of farming systems at realistic scales, and will generate high quality data on production and agri-ecosystem responses. The farm platform will enable more detailed studies of the processes that generate these responses, within a well-resourced, collaborative and integrated research environment. The platform will also benefit from links to the Defra funded GHG inventory work some of which is also taking place at North Wyke.

#### **4. Translation & Innovation**

##### **a. Translating Research into Use**

There is an apparent low uptake/adoption of research and innovation in the agri-food industry and a lack of capacity in the system to capture and translate available information. In addition, there is a further need to enable users to make better use of the excellent UK science base and address their challenges using existing as well as new knowledge.

The FRP is currently exploring how the translation and exploitation of food research can be improved and looking at the balance of roles between the public and private sectors. Studies have been commissioned to consider translation of research into use within the wheat, dairy and horticulture supply chains. The wheat study funded by Defra and BBSRC, and the dairy study funded by GO-Science, DairyCo and the Technology Strategy Board, are still ongoing. The National Horticulture Forum has already completed a study on innovation in the strawberry and brassica sectors.

Evidence from these studies will inform the development of proposals for further action, for the FRP to consider.

Following publication of the Taylor Review '*Science for a New Age of Agriculture*' (September 2010), Defra is facilitating activity with other

Departments, Research Councils and industry to take forward the recommendations. These focus on encouraging private sector investment, invigorating applied research and translating the benefits of R&D into practice.

## **b. Sustainable Agriculture and Food Innovation Platform**

The TSB has launched the Sustainable Agriculture and Food Innovation Platform to bring government, business and researchers together in a major initiative to stimulate the development of new technologies that will increase food productivity, while decreasing the environmental impact of the food and farming industries. An investment of up to £90M over the next five years includes co-funding from Defra (£30M) and the BBSRC.

The Innovation Platform will focus on four interlinked areas:

- Crop productivity including protection and nutrition
- Sustainable livestock production
- Waste reduction and management
- GHG Reduction Technologies and Methodologies

The first competitive call in 2010 '*New Approaches to Crop Protection*' provided 32 projects with total grant funding of £13.5M. A more recent call focuses on helping to secure a sustainable future protein supply for the UK, with two core themes: increasing self-sufficiency in vegetable protein and increasing efficiency of livestock systems.

## **5. Coordination & Collaboration**

The UK cross-Government Strategy aims to support a secure, sustainable food chain which is safe, affordable and healthy, in the UK and globally, and a thriving UK agri-food sector, making best use of science and technology innovations. Many of the research issues which arise in pursuing this are, by their nature, complex and multi-disciplinary, and will often overlap departmental / organisational remits. Tackling these in an effective way requires strong links between funders, and innovative yet pragmatic co-operation - to promote a coherent, coordinated approach and to develop timely programmes to address the key questions, while making best use of (increasingly) pressured resources. Some examples of how this has been achieved in the last year are provided below:

### **a. Global Food Security Programme**

The new multi-partner Global Food Security programme (GFS) brings together the food-related research interests across government, five research councils and the TSB. The programme will build on the partners' existing activities, add value to current investments and facilitate joint work around shared goals.

The Strategic Plan (2011-2016), published in February 2011, highlights how the GFS programme will be governed and combine the partners' strengths to add value in addressing the challenge of food security in the UK and globally.

The programme comprises four cross-disciplinary themes based on those set out in the *UK Cross-Government Food Research and Innovation Strategy*. All themes (but especially 2 and 3 below) will take into account the sustainability of ecosystems related to food production (including land use, biodiversity and other ecosystem services) and the overarching challenges of reducing greenhouse gas emissions and reducing losses and waste throughout the food system.

1. *Economic resilience*– securing a better understanding of how poor economic resilience leads to hunger, poverty and environmental degradation across the globe and how this might be addressed
2. *Resource efficiency* – including water, energy, nutrients and other inputs; land use and soils, with particular focus on the sustainable use of resources; increasing competitiveness, profitability, efficiency and reducing waste
3. *Sustainable food production and supply* – including farming systems, food production from crops and animals (including fish), food processing, manufacture and transport
4. *Sustainable, healthy, safe diets* – including food safety throughout the supply chain, nutrition, consumer behaviour, food choice and accessibility.

A Global Food Security ‘Champion’ will act as a high-profile ambassador and spokesperson for the programme and a link between the funders, research community, the public and users of research. A key role will be to provide a single point of contact between GFS and other related and synergistic activities.

A Strategy Advisory Board of senior representatives drawn from academia, industry and other relevant stakeholders, will provide independent advice and guidance on the strategic direction of the programme. The Board will be chaired by Lord Cameron of Dillington, who also co-chairs the All Party Parliamentary Group on Agriculture and Food for Development. The Government Chief Scientific Adviser, Sir John Beddington, will be a member of the Board and provide an important link to the Food Research Group and Partnership.

#### **b. Campylobacter Research and Innovation Strategy**

The BBSRC, Food Standards Agency, Defra and other key stakeholders (including the Department of Agriculture and Rural Development) have collaborated to develop a cross-Government Campylobacter Research and Innovation Strategy. This has led to a joint funding call to support research which will underpin the needs of policy makers and industry aimed at reducing levels of Campylobacter in the UK food chain and ultimately the incidence of Campylobacter infection in humans. The first awards (expected to total in the region of £3M) from this joint call will be made shortly.

### **c. Collaborative research on food allergy**

The Medical Research Council and the FSA have announced a joint call for research to help improve understanding of the biological mechanisms that cause food allergies.

Food allergy is a common and important disease, affecting up to 2% of adults and between 5% and 8% of children in the UK. Symptoms vary but can be severe and result in anaphylaxis, and occasionally death.

This research will be used to help improve the diagnosis and management of food allergies, to identify risk factors for the development of food allergy in early life which will inform advice to consumers, as well as to help design effective interventions to prevent the development of food allergies, and to help desensitise people from allergies.

### **d. Defra food research co-ordination group**

The group meets on a quarterly basis at the working level to consider Defra's research priorities. It helps facilitate effective collaboration between food research funders through the sharing of expertise and research needs to identify common goals, potential opportunities for co-funding and collaborative links, and horizon scanning to identify research needs and potential areas of overlap.

### **e. Nutrition for Life**

The TSB, together with the BBSRC, the Engineering and Physical Sciences Research Council and the MRC is to invest up to £6.25M to stimulate innovation in the food and drink sector. The investment is intended to encourage the development of innovative processes and technologies with an emphasis on providing "healthy" and "safe" food and drink, and will support both feasibility studies and collaborative research & development projects.

Applications to the Nutrition for Life funding competition should propose to conceive and develop innovative and challenging technologies and processes that seek to underpin advances in two key areas – (a) novel, healthier foods & processes and (b) safety, authenticity & traceability. All proposals must be led by a business. The initiative is open to all UK-based companies and research organisations, through business-to-business or business-to-science collaborations, or in the case of feasibility projects, led by a single business.

## **6. EU and International**

### **a. UK Engagement in International Agri-Food Research**

The FRP is currently reviewing the UK's international engagement on agri-food research, to advise on priorities, opportunities and areas for

strengthening. It is due to report in late 2011. Consideration is being given to issues relating respectively to Europe, agricultural “superpowers”, emerging countries and the developing world. Working with stakeholders, FRP is first establishing key aspects of the international arena for each of these categories, as well as cross-cutting issues. Key issues discussed to date include: Common Agriculture Policy Reform, future EU programmes beyond FP7, skills, industry, grand challenges, the HEI sector and mapping funding that supports UK engagement in research for development.

Defra also participates in the Global Research Alliance (GRA) initiative on greenhouse gas emissions to find new ways to grow more food without increasing greenhouse gas emissions from agriculture. Recent initiatives include finalising the GRA charter, completing a stock-take of current research activities and developing medium and long-term action plans for collaborative work.

#### **b. UK Engagement in the European Research Area**

The FRP is considering how the UK can exploit opportunities in the European Research Area through coordination mechanisms such as ERA-Nets and Joint Programme Initiatives, and collaboration through the RTD Framework Programme generally.

The UK, along with the French National Institute for Agricultural Research is helping to drive the Joint Programming Initiative on Agriculture, Food Security, and Climate change (FACCE-JPI), a multi-partner EU project designed to coordinate activity in this area across the EU (<http://www.faccejpi.com/>). The objective of Joint Programming is to "increase the value of relevant national and EU R&D funding by concerted and joint planning, implementation and evaluation of national research programmes". FACCE-JPI has recently expanded to include 19 countries with Poland and Switzerland being the newest members.

Likewise, the UK is contributing to the JPI on ‘A Healthy Diet For A Healthy Life’ (JPI HDHL). It includes 20 countries and aims to co-ordinate activity across 3 interacting research areas: determinants of diet and physical activity, diet and food production and diet-related chronic diseases (<https://www.healthydietforhealthylife.eu/>).

To help lead the thinking on future EU programmes and possible structures beyond FP7, the FRP hosted a workshop and consultation regarding food related themes. The agreed summary position paper forms part of the evidence base to be drawn on by the Department of Business, Innovation and Skills in negotiating future EU programme design and priorities.

#### **c. UK Engagement in Agri-Food Research for Development**

**Progress on CGIAR reform:** In the past year considerable progress has been made in reforming the Collaborative Group on International Agricultural Research (CGIAR) to meet the challenges of global food security and to capitalise on its global network of world class scientists and plant genetic resources. A new model for funding the CGIAR has been established, with



contributions from four donors, including the Department for International Development. Two Mega Programmes have been approved – Climate Change Agriculture and Food Security and the Global Rice Systems Programme. The UK has a seat on the Fund Council and is represented on the Independent Science and Partnership Council, which reviews all research proposals.

**Agriculture, Nutrition and Health:** DFID has developed a new policy and research work stream focusing on improved nutrition. Key deliverables have been a new research programme supporting agriculture and food security policy in South Asia, (supported by DFID regional research hub), progress in developing and field testing bio-fortified crops, a systematic review of the evidence linking agriculture with nutrition outcomes and support to the Partnership for Aflatoxin Control in Africa. This will remain a major focus of DFID's research and policy.

**Agriculture and Climate Change:** In response to a mapping exercise conducted last year, DFID has strengthened support on climate change and agriculture, including an initiative to improve climate change and agriculture models. This was a recommendation of the 4<sup>th</sup> IPCC Assessment Report. In addition, a new programme will support the development of national climate change adaptation plans in South Asia, with another being developed for Africa.

**Infectious Animal Disease:** DFID is undertaking two systematic reviews on zoonotic disease to inform the development of a new research programme.

**DFID-BMGF partnership:** DFID has established a new partnership with the Bill and Melinda Gates Foundation to co-fund projects of relevance to both parties. This will draw on the Foundation's technical expertise and well established programme. DFID will contribute to the Durable Rust Resistance in Wheat programme to support improved disease diagnostics.

**DFID-ESRC programme:** DFID and the Economic and Social Research Council (ESRC) are partners in a new programme on economic growth in developing countries. The DFID/ESRC Growth Programme will fund world class scientific research on issues relating to inclusive economic growth in Low Income Countries (LICs), with high potential for impact on policy and practice. There will be three themes under the call; Agriculture and Growth, Financial Sector Development and Growth and Innovation, Diffusion and Economic Growth

#### **d. Research Initiative – Food Security for Developing Countries**

DFID and the BBSRC have established a strategic partnership to support high quality basic and strategic biological and biotechnological research in crop science and animal health, where this has the potential to contribute to achieving the Millennium Development Goals. A key aspect is to facilitate partnerships between scientists in the UK and developing countries. The initiative, to be managed by BBSRC, has a £20M fund with contributions from

BBSRC, the Bill & Melinda Gates Foundation (through a grant to BBSRC), DFID and the Indian Department of Biotechnology. Calls have been launched to-date on: Sustainable Agriculture Research for International Development (SARID) and Combating Infectious Diseases of Livestock for International Development (CIDLID).

The initiative, Sustainable Crop Production Research for International Development (SCPRID) will fund teams from the UK, India and developing countries to work on research to improve the sustainability of vital food crops. The research will investigate ways to improve the disease-resistance and stress-tolerance of staple crops in sub-Saharan Africa and South Asia. Funding will be awarded to teams that can show that their research can improve food security and increase sustainable crop yields within the next 5-10 years.

## **7. Horizon Scanning**

### **a. Global Food and Farming Futures Foresight Project**

In January 2011, the Government Office for Science published a major new report examining how a future global population of 9 billion can all be fed healthily and sustainably. This two year Foresight project - Global Food and Farming Futures - commissioned over 80 scientific reviews and involved over 400 leading experts and stakeholders from 35 countries. The project was guided by international experts from the UN, EU, World Bank, industry and civil society, and drew also on other well regarded international studies. The report and evidence base can be found on the website at [www.bis.gov.uk/foresight](http://www.bis.gov.uk/foresight).

The report identifies the most important challenges and choices for policy makers to balance the competing pressure and demands on the global food system. It has identified and analysed the following five key challenges for the future:

- A. Balancing future demand and supply sustainably – to ensure that food supplies are affordable.
- B. Ensuring that there is adequate stability in food supplies – and protecting the most vulnerable from the volatility that does occur.
- C. Achieving global access to food and ending hunger.
- D. Managing the contribution of the food system to the mitigation of climate change.
- E. Maintaining biodiversity and ecosystem services while feeding the world.

Priorities areas for action identified include:

- *Minimising waste in all areas of the food chain* – An amount of food equivalent to about a quarter of today's annual production could potentially be saved by 2050 if the current estimate of global food waste is halved.

- *Focus on sustainability* – the application of existing knowledge and technology could increase average yields two- to threefold in many parts of Africa, and twofold in the Russian Federation. Similarly, global productivity in aquaculture could, with limited changes to inputs, be raised by around 40%.
- *Improving governance of the global food system* – It is important to reduce subsidies and trade barriers that disadvantage poor countries. The project’s economic modelling shows how trade restrictions can amplify shocks in the food system, raising prices further.
- *Knowledge is power* – investment in science and technology is advocated to raise the limits of sustainable production and address new threats. No one technology or type of research offers a silver bullet for addressing sustainable production, but many can contribute. There is a need to increase our understanding of animals to improve yields while also increasing water, nutrient and other efficiencies. Further research priorities link to climate change adaptation and mitigation in the food system, for example to produce crops that are drought and flood resistant.

#### **b. Commission on Climate Change and Sustainable Agriculture**

- The Climate Change, Agriculture and Food Security programme (CCAFS) of the Consultative Group on International Agriculture (CGIAR) and the Global Donor Platform for Rural Development have set up a new International Commission on Sustainable Agriculture and Climate Change. The Commission will bring together existing evidence to identify policy changes and actions needed now to help the world achieve sustainable agriculture that contributes to food security and poverty reduction, and help respond to climate change adaptation and mitigation goals. The Commission’s findings will inform future discussions and decisions where these relate to agriculture and food security in the international climate change negotiations, as well as other global and national plans of action on food security and climate change.

### **8. Looking Ahead**

In moving forwards, the Global Food Security programme will be key in supporting an increasingly coordinated and collaborative approach to public funded food research and innovation, as it becomes more fully operational and builds its portfolio. The Programme will also extend its leadership on key cross-cutting issues, such as skills, infrastructure and translation.

A further priority will be ensuring uptake of the findings and underpinning scientific evidence from the Foresight Global Food and Farming Futures Report to influence policy across the range of national and international stakeholders.

The Report sets out a variety of actions which will need to be taken by the UN and other international organisations, national governments of both high- and

low-income countries, the EU, the private sector, NGOs, the research community and civil society to address the challenges highlighted..The commitments of a number of stakeholders to act on key messages are captured in the '*The Future of Food and Farming: Action Plan*', available from the Foresight website:

<http://www.bis.gov.uk/assets/bispartners/foresight/docs/food-and-farming/11-683-future-of-food-and-farming-action-plan.pdf>.

Engagement to date has already included UK Parliament, international organisations such as US AID, the World Bank and the American Association for the Advancement of Science (AAAS), business leaders in Washington and Brussels, and countries including Africa, China and Brazil. Alongside this, seminars for officials in the two sponsoring departments, Defra and DFID, will be followed by more detailed work to discuss the implications of the findings across Government policy.

Bringing the two initiatives together, the Global Food Security programme will work with members of the Lead Expert Group of the Foresight Project to convene a workshop in June 2011 to consider the “100 key questions” developed during the Project. This will help to identify both existing and new research opportunities that should be tackled by the programme, through a multi-disciplinary approach.

In autumn 2011, the international Commission on Climate Change and Sustainable Agriculture will launch its findings and will continue to ensure its recommended policy changes and actions are taken up by decision makers on climate change and agriculture policies.

Other future actions are noted throughout this report. In summary, a very good first year in delivering the Food Research and Innovation Strategy, with important progress made on many fronts. But much remains to be achieved in the years ahead.

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