Food/agriculture research in the UK

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Department for Environment, Food and Rural Affairs
OECD Co-operative Research Programme (1 Dec 2011)
Overview of UK Science, Engineering and Technology
Sustainable Food Supply: Studies shaping our current thinking...

- IAASTD 2008: ‘Agriculture at a Crossroads’
- Royal Society 2009: ‘Reaping the benefits’
- Foresight Global Food and Farming Futures – 2010
Royal Society science policy study: “Reaping the benefits”…

Headlines

- Major problems ahead:
  - Need a substantial increase in food production

- Report calls for:
  - £2 billion Grand Challenge for research
  - Sustainable intensification
  - Both improvements in crops and agro-ecological management

- Published 21 October 2009

http://royalsociety.org/reapingthebenefits
The Project analysed five key challenges for the future:

**Balancing future demand and supply sustainably** – to ensure that food supplies are affordable.

**Ensuring that there is adequate stability in food prices** – and protecting the most vulnerable from the volatility that does occur.

**Achieving global access to food and ending hunger** - this recognises that producing enough food in the world so that everyone can potentially be fed is not the same thing as ensuring food security for all.

**Managing** the contribution of the food system to the mitigation of climate change.

**Maintaining** biodiversity and ecosystem services while feeding the world.
Food/Agriculture Research in the UK

Public Funding Organisations

[Logos of DEFRA, Scottish Government, BBSRC, and DARDNI]
### Scottish Government Rural and Environment Strategic Research - Programmes of Research 2011-2016

#### Themes:

- **Ecosystem Services**
- **Strong and resilient sources and supply chains for water and energy** *(Water and Renewable Energy)*
- **Technologies and management tools to deliver greater benefits from rural land use and increased resilience to change** *(Land use)*
- **A rural economy resilient to global and local change** *(Economic adaptation)*

#### Environmental Change *(Local Responses to Global Change)*

- **Efficient and resilient supply chains for food** *(Food)*
- **Animal/plant health and disease and animal welfare** *(Health and Welfare)*
- **Healthy safe diets** *(Diet and Health)*
- **Vibrant rural communities** *(Rural Communities)*

Both programmes approx £37m for 2011-12
Dept. Agr. Rural Development for Northern Ireland

• DARD Evidence and Innovation Strategy (EIS) 2009-13 provides the framework for research and development activities;

• Research provides an evidence base to support DARD’s policies and services and/or promotes innovation in agri-food, fishing, forestry and other rural businesses;

• Core annual expenditure of around £8-9m across a range of areas, including food, agriculture, fisheries and environment;

• Research is policy-led and informed by stakeholder engagement;

• Key aim is to pursue opportunities for collaboration and engagement with local, national and international partners

• Gaps and priorities identified by 4 Programme Management Boards, reporting to an Evidence and Innovation Priorities Group – one PMB for animal health;

• Annual Call for proposals commenced in 2010;

• Research delivered primarily by the Agri-Food and Biosciences Institute (AFBI) – an independent non-departmental body;

• Knowledge exchange primarily through the College of Agriculture, Food and Rural Enterprise (CAFRE), an integral part of DARD.
Budget of £445 million in 2011-12

The leading funding organisation in agricultural research in the UK, spending £189m p.a. on food related research, funding basic and applied studies on plants, microbes and animals and on the tools and technology underpinning biological science.

Primarily funds academia through HEI and research council institutes but also funds industrial collaborative schemes, international collaborations and public engagement work.

Supports 8 institutes whose research underpin key sectors of the UK economy. These include:

- Institute for Animal health – livestock infectious diseases
- Institute of Food Research – food structure and health
- John Innes Centre – plant perception and response to the environment
- Rothamsted Research – sustainable pest and disease management
• Significant funder of agriculture and food-related research both in the UK and overseas

• **Research Strategy 2008-13** sets out its approach to research on agriculture, fisheries and forestry

• **Aims to double support for agriculture to £400m between 2010-14**, to provide farmers in developing countries with access to technologies and to help national governments with more effective agricultural policies based on a robust evidence base.

• **Funds spent in 5 areas:**
  - International agricultural research organisations e.g. CGIAR
  - Regional research organisations, in particular Africa
  - Responsive programmes with BBSRC on crop science and animal health
  - ‘Research into use’ programme promoting outputs from previous DFID funded research in Africa and S Asia
  - Public-private partnerships to develop technologies for farmers
Food/Agriculture research in the UK

Department for Environment, Food and Rural Affairs
Defra has three main business priorities between 2011-15:

- Support and develop British farming and encourage sustainable food production
- Help to enhance the environment and biodiversity to improve quality of life
- Support a strong and sustainable green economy, resilient to climate change

Other major responsibilities are to prepare for and manage risk from:

- animal and plant disease
- flood and other environmental emergencies
Defra’s Evidence Strategy: the Big Challenges

Interdisciplinary working

Understanding and influencing behaviours

Support a Strong and Sustainable Green Economy

Climate Change Adaptation and Mitigation

Sustainable food Production

Enhance Environment and Biodiversity

Innovation
Evidence in Defra

Evidence Investment Strategy sets out 5 key strategic objectives to respond to the Big Evidence challenges:

• Prioritise investments between programmes
• Sharpen our focus to deliver evidence and innovation
• Increase cooperation using partnership working to share the investments, knowledge and expertise
• Develop and organise the right skills, expertise and capabilities
• Refine our processes
Evidence Cycle

Defra Policy Cycle

The Evidence Cycle

- Agenda setting
- Define the issue
- Understand the situation
- Develop & appraise options
- Implement & monitor
- Evaluate & adapt
- Prepare for delivery
- Commit to responsibilities

Outcome focus

Identify and prioritise evidence needs
- Evidence Assurance
- Stakeholder Engagement
- Value for Money

Assess the impact of evidence
- Set up evaluation required
- Gather evidence required
- Interpret evidence
Evidence Plans

• Maintaining clear links between policy objectives and evidence needs;
• Ensuring best use of others’ evidence and partnership opportunities;
• Showing a clear rationale for Defra investment in evidence; and
• Helping prepare for policy evaluation.
## Defra’s Evidence budgets 2010/11 and 2011/12

<table>
<thead>
<tr>
<th>Group</th>
<th>Total evidence budget 2010/11 (£m)</th>
<th>Total evidence budget 2011/12 (£m)</th>
<th>% Decrease (cash terms)</th>
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</thead>
<tbody>
<tr>
<td>Animal Health and Welfare</td>
<td>67.8</td>
<td>63.2</td>
<td>7%</td>
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<tr>
<td>Food and Farming</td>
<td>43.3</td>
<td>42.3</td>
<td>2%</td>
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<tr>
<td>Environment and Rural</td>
<td>85.3</td>
<td>81.3</td>
<td>5%</td>
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<tr>
<td>Green Economy and Corporate Services</td>
<td>13.0</td>
<td>12.0</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>209.3</strong></td>
<td><strong>198.9</strong></td>
<td><strong>5%</strong></td>
</tr>
</tbody>
</table>

(Figures exclude capital spend and core Defra staff costs)
Defra AH&W Research 2011/12 costs

Total Spend in 2010/11 30,105,358

- Animal Welfare 2,494,219
- TSEs and Animal by products 5,777,672
- Exotic Diseases 7,386,789
- bTB 6,845,622
- New and Endemic Diseases 1,394,167
- Public Health Protection 2,253,434
- Vet Medicines and Antimicrobial Resistance 2,262,121
- Aquatic Animal Health 1,691,334
Food/Agriculture research in the UK

UK Partnerships

Living With Environmental Change (LWEC)
UK Global Food Security programme

- UK’s main public funders of food-related research and training working together
- Interdisciplinary and whole systems approaches to research on UK and global food supply systems
- Building on partners’ existing activities, adding value to current and future investments, complementing rather than replacing individual strategies
- 4 Cross-disciplinary themes based on those set out in the *UK Cross-Government Food Research and Innovation Strategy*
A coordinated strategy for UK food research

Published 5 January 2010

Taking into account the sustainability of ecosystems related to food production, the need to reduce GHG emissions, and reducing losses and waste, the 4 themes:

**Economic resilience** – understanding how poor economic resilience leads to hunger, poverty and environmental degradation

**Resource efficiency** – including water, energy, nutrients and other inputs, land use and soils, increasing competitiveness, profitability, efficiency and reducing waste

**Sustainable food production and supply** – including farming systems, food production from crops and animals, food processing, manufacture and transport

**Sustainable, healthy, safe diets** – including food safety, nutrition, consumer behaviour, choice and accessibility
A platform for co-ordinating activities to address the key challenges in UK agri-food research and innovation systems.

Key Issues

- *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?
- *International research collaboration*: Examine the UK’s international food research engagement, identifying key issues, priorities and opportunities to strengthen the UK’s current approach and impact.
- *Possible further issues groups to address other key themes*: better management and regulation of emerging technologies; improving the sustainability of food systems (including waste reduction); and supporting healthier food and choices.
Living with Environmental Change

- Interdisciplinary research & policy partnership to tackle environmental change
- £1bn over 5 years
- Providing decision makers with information on policy relevant temporal and spatial scales
Food/Agriculture research in the UK

EU and International Partnerships
FP7 KBBE ACTIVITIES

KBBE - Activity 2.1
Sustainable production and management of biological resources from land, forest and aquatic environments

KBBE - Activity 2.2
“Fork to farm”: Food (including sea-food), health and well being

KBBE - Activity 2.3
Life sciences, biotechnology and biochemistry for sustainable non-food products and processes
ERA-Nets in the ENV and Food/Agriculture areas

BiodivERsA II

CIRCLE 2 (climate impact)

CRUE (flood risk management)

ERA-ENVHEALTH

SEAS-ERA

SNOWMAN (Soils and ground water)

SKEP (Env protection)

EUPHRESO II (Plant Health)

ARD II: Agricultural Research for Development

EMIDA (Animal Health)

Plant Genomics

Bioenergy

ERASysBio

CORE-Organic II

MARIFISH

SAFEFOODERA

ARIMNET (MED)

WoodWiosdomNet
Coordination of European Research on Emerging and Major Infectious Diseases of Livestock

A 39 month Coordination and Support Action (Coordinating) project with a budget of 1 Million Euros

Began 1 April 2008
Need for coordination in Animal Health research

• Common problems - animal diseases are the biggest threat to livestock production.
  • Exotic diseases
  • Evolving/remerging pathogens
• Legislation relating to animal welfare and disease control is largely enacted at the EU level requiring a common evidence base.
• Animal research is expensive
• Better sharing of information of current activities
  
  http://www.emida-era.net/

• Better coordination of the national research programmes

• Developing common research agendas

• Joint/common research calls

• Building research capacity relating to animal health
1st Common Call

77 Pre-proposals
45 Full proposals
12 Selected for funding

Total value of projects > €21.37 million (partners are contributing €15.25 million)

http://www.emida-era.net/index.php?page=content&id=17
Global Strategic Alliances for the Coordination of Research on the Major Infectious Diseases of Animals and Zoonoses

STAR-IDAZ
STAR-IDAZ

• This global initiative will address the coordination of research programmes at international level in the area of animal health and in particular infectious animal diseases including zoonoses. It will build on the existing relevant ERA-NET and INCO-NETs through the creation of a global network of research funding organisations.
22 partners in 17 countries including 3 industrial partners

- Canada, US, Mexico, Brazil, Argentina, Russia, China, Australia, New Zealand, India, Germany, Denmark, the Netherlands, France, Spain, Italy and the UK

- Pfizer, Merial and IFAH

- 4 associated partners

- OIE, Wellcome Trust, Japan and EFSA
State of Play
23 Participants in this JPI

- Austria
- Czech Republic
- Cyprus
- Denmark
- Estonia
- Finland
- France
- Germany
- Hungary
- Ireland
- Israel
- Italy
- The Netherlands
- Norway
- Romania
- Slovakia
- Spain
- Sweden
- Turkey
- UK
- EC + SCAR (obs)

New partners:
- Switzerland
- Belgium;
- Poland
- Cyprus
Food/Agriculture research in the UK

Knowledge
Exchange/Transfer

Technology Strategy Board
Driving Innovation

BBSRC
bioscience for the future

AHDB
Agriculture & Horticulture
DEVELOPMENT BOARD
Sustainable Agriculture and Food Innovation Platform

• To support the development of innovative technologies, that will drive sustainable increases in the productivity of the UK Agri-food sector, whilst reducing its environmental impact.

• Led by Technology Strategy Board with Defra, BBSRC and Scottish Government providing up to £90 million of investment over 5 years. Investments made jointly with industry and other funders.

• Focus on 4 interlinked themes:
  - Crop productivity including protection and nutrition
  - Sustainable livestock production
  - Waste reduction and management (farm to fork)
  - GHG reduction technologies and methodologies

www.innovateuk.org
First collaborative R&D competition ‘New approaches to crop protection’ (January 2010):
  - 32 projects funded; £13.6m investment (£26m total project value)
  - Broad remit (plant breeding, engineering solutions, chemical compounds)

Second collaborative call (April 2011) had two core themes around ‘Sustainable protein production’:
  - Increasing domestic supply of sustainably produced vegetable protein for farmed animals (including land and marine based aquaculture)
  - Increasing production efficiency and sustainability of domestically supplied animal and fish protein for food, and reducing waste in the food chain to the point of retail sale.
  - Government investment of up to £15m

www.innovateuk.org
Knowledge Transfer Networks (KTNs)

Established by the Technology Strategy Board to:

- Stimulate innovation in the UK’s key technology areas
- Link different organisations – each playing a part in delivering objectives
- Provide a means of efficiently using the support mechanisms already available

Specific aims include:

- To deliver improved business performance through innovation
- To drive knowledge transfer between the supply and demand sides of technology-enabled markets
- To facilitate innovation and KT by providing UK businesses with the opportunity to meet and network

Currently 15 KTNs including on Biosciences and Environmental Sustainability
Biosciences KTN

Working with four identified sectors:

Priority themes:

- Food for Health
- Innovation in Animal and Plant Production and Performance
- Renewable and Sustainable Bioproducts
- Sustainable Food Supply and Security
Environmental Sustainability KTN

Four Thematic Areas:

• Sustainable Water
• Sustainable Energy
• Sustainable Land Management and Food Production
• Resource Efficiency and Sustainable Waste Management

15 Priority Areas identified that offer the greatest potential for British businesses to develop innovative and environmentally sustainable products and services
• A 5 year, £7m partnership with Scottish Government and an industry consortium aimed at supporting innovative and excellent research to underpin the development of improved crop varieties that deliver increased productivity and consistent, high quality end products.

• Themes support research leading to:
  o Improved crop productivity; and
  o Improved crop quality

• Research focus on oilseed rape, barley, wheat and their uses in food production for humans and animals
BBSRC Advanced Training Partnerships in Agri-Food

• Providing a range of specialist high level training (masters, professional doctorate and continuous professional development) to meet industry needs in partnership with the higher and further education sectors.

• To date £12m awarded to 4 Partnerships, each focusing on a specific but complementary research area:

  - Sustainable and efficient food production
  - Establishing a strategic hub to advance the UK agri-food industry
  - Food quality and health – sustaining the future
  - Advanced training in intensive livestock health and production
An evidence-based levy board playing a pivotal role in improving the efficiency and competitiveness of the agriculture and horticulture industries.

Sits at the interface between R&D providers, consultants, farmers and growers, and government departments and agencies.

Undertakes R&D and farm-level knowledge transfer and knowledge exchange activity.

Represents about 75% of total UK agricultural output, supporting 6 sectors:

- Meat and Livestock (cattle, sheep and pigs) in England;
- Horticulture, Milk and Potatoes in Great Britain;
- Cereals and Oilseeds in the UK