

## **SUSTAINABLE, SECURE AND HEALTHY FOOD SUPPLY EVIDENCE PLAN 2011/12**

Evidence Plans are part of Defra's business planning processes. They have been developed for each policy programme, ongoing function or hub with a substantial evidence base

The main purposes of Evidence Plans are to help Defra policy and evidence teams to:

- Maintain a clear 'line of sight' between policy objectives and evidence needs;
- Ensure best use of others' evidence and maximise opportunities for partnerships;
- Show a clear rationale and value for money for Defra investment in evidence;
- Prepare for policy evaluation.

### **1. POLICY RATIONALE**

TO NOTE that the Food Strategy embraces the whole food chain, however, for the purposes of this Evidence Plan, we are focusing on the Resource Efficient and Resilient Food Chain Programme (post farm gate), which has traditionally supported food policy so as not to duplicate the content of other Evidence Plans. Crop and Livestock Hub activity funded under the Programme is excluded and covered in separate hubs Evidence Plans

#### **1.1 Policy context**

Historically food policy has focussed on economic support and production, sponsorship with industry and implementing food actions arising from the Curry Report. In the last 2 years food policy has taken a holistic view of the food system and brought together work on environmental impacts of the food chain, consumer behaviour and food security to develop the Food Strategy which will drive delivery of a sustainable, secure and health food supply. Defra's Food Policy Unit is the UK lead for cross-Government coordination on food.

The Food Strategy set out the priorities for the UK Government and the rest of the food chain on food and is a response to the big challenges on food i.e. sustainability, security and health. The publication of the Food Strategy has led to the Food Policy Unit (FPU) taking stock of its policy direction, and assessing its priorities in terms of delivering the strategy in line with the requirements of the new administration. The coalition government has set out its initial objectives and priorities in the Departmental business plan. As the Strategy embraces the whole food chain, all 3 Structural Reform priorities in the Business Plan are relevant:

- 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

In addition, there are some food specific actions:

- Drive sustainable food procurement by the Government and the public sector
- Promote increased domestic food production, and ensure that consumers can be confident about where their food comes from.

As well as food industry-related actions:

- Drive a 'zero waste' agenda
- Promote a low-carbon and eco-friendly economy

- Support economic growth in rural areas

The Food Strategy themes, priorities and actions highlighted above are set within the context of a series of challenges faced by the food system which are summarised below:

- **Climate Change** – The UK food chain accounts for an estimated 22% of all UK emissions from economic activity nearly half of which results from methane and nitrous oxide resulting from agricultural activity. Per unit volume these trap far more heat than carbon dioxide, which explains why agriculture accounts for 7% of our total greenhouse gas emissions in terms of carbon dioxide equivalent. Food sector businesses also account for emissions through energy usage in workplaces, and transport, and emissions from food waste in landfill are estimated at 21 million tonnes of CO<sub>2</sub>. The impact of climate change is also an important consideration as there may be a requirement for adaptation and the security of the food supply may be affected.
- **Global Food Security** – global population is projected to rise to 9 billion by 2050. It is estimated that food production will have to rise by 70% to meet projected demand with more people to feed and changes in diet towards increased meat consumption in developing countries with expectations of increased demand for land e.g. for bio-fuel crop production. UK food production must to meet demands in ways which carefully manage the natural environment and do not undermine our ability to produce more in the future.
- **Diet related ill health including obesity** – it is estimated that 70,000 premature deaths in the UK could be avoided if diet matched nutritional guidelines on fruit and vegetable consumption and recommended levels of sugar, salt and fat. Diet related ill health is estimated to cost the NHS over £7 billion a year.

The food system is global, multifaceted and complex. Against this backdrop, there is a need to act now in order to secure a resilient food system for the future. This will require a considered and joined up policy approach capable of prioritising the risks amongst the complexities, and harnessing the power of industry, third sector and consumers to bring about change. Intervention is necessary in order to inform a co-ordinated approach across a number of different players ranging from industry to NGOs and the third sector. Inaction will result in market failure; for example continued depletion of natural capital by the food system.

To support development of this policy direction FPU have completed a review of the former Food Chain Programme policy areas.

Ministers have signed up to the 6 Food Strategy themes. These are:

1. Enabling and encouraging people to eat a healthy, sustainable diet
2. Ensuring a resilient, profitable and competitive food system
3. Increasing food production sustainably
4. Reducing the food system's greenhouse gas emissions
5. Reducing, reusing and reprocessing waste
6. Increasing the impact of skills, knowledge, research and technology

Effort will focus on addressing Themes 2 and 3 which reflect immediate Defra Business Plan priorities around increasing competitiveness, opportunities for economic growth and encouraging sustainable production sustainably and supporting a green economy.

## 2. CURRENT STATE OF KNOWLEDGE, INVESTMENT AND FUTURE REQUIREMENTS

### 2.1 Current state of knowledge

*Please also [annex key references](#).*

#### **Competitive and resource efficient food chain**

Research to support efficient and competitive food and drink manufacturing has historically been developed in support of the Food Industry Sustainability Strategy. This has focussed on improving quality and reducing waste through raw material/ingredients modification, reducing food spoilage, extending shelf life and developing better process design and control systems in food processing and manufacturing. Effort has also encompassed environmental concerns to develop innovative solutions to support a more sustainable food industry.

**Food security, resilience and sustainable production** are emerging issues so the evidence base is in the early stages of development. Knowledge gaps include understanding business drivers, economic and social issues affecting the food chain. These include the impacts of policy options and effect of behaviour change. We have a good understanding UK food security parameters and drivers of food prices. Defra's Family Food dataset, annual statistics pocket book, library of statistical indicators and the Food Security Assessment provide a robust basis for economic policy analysis. However the knowledge base around food chain resilience and our understanding of risks to the food supply is under-developed.

There are also gaps in our understanding of whole food chain inter-relationships, attitudes, behaviours and practices across different sectors and knowledge of uptake and barriers to new approaches to food production and manufacture. Research is needed to understand the environmental impact of the supply chain as a whole (including waste), with SME's and the food service sector requiring particular attention.

There is a significant body of research looking at improved agricultural practices (pre farm-gate) to contribute to climate change mitigation and adaptation much of which has been taken forward under the Adaptation to Climate Change Evidence Programme. However the evidence base to achieve a low carbon food chain (post farm-gate) is under-developed. Work is needed to develop metrics, build life cycle assessment knowledge (particularly of processed foods) and understand processes, barriers and behaviours to promote uptake of lean-thinking practices to reduce environmental impacts across the food chain.

#### **Sustainable consumption**

Research to support sustainable consumption and address consumer confidence in food includes an established evidence base on food authenticity, healthy food consumption and behavioural drivers for food uptake. The evidence base to support understanding of a healthy sustainable diet, its impact on the food supply chain and consumer attitudes and behaviours towards sustainable consumption is under-developed. Particularly the ability to characterise these diets and identify behavioural barriers and drivers for sustainable food choices and understand their environmental impacts.

#### **Food Authenticity**

The food authenticity programme develops methods to detect food misdescription and adulteration and thereby assists enforcement of the legislation that covers the labelling requirements and compositional standards for food. This well-established research base has developed methods to detect food misdescription and adulteration, and often focus on the adaption and/or development of cutting-edge methodologies. The programme funds all stages of method development, from feasibility studies to method validation for use by official food control laboratories and enforcement authorities. Methods are developed into a standard

operating procedure (SOP) format to facilitate technology transfer to public analysts and other analytical laboratories and research outputs published in peer-reviewed journals.

## 2.2 Primary objectives of evidence activities

Food chain evidence priorities to support delivery of food policy to achieve a sustainable, secure and healthy food supply and address overarching objectives to:

- Increase competitiveness and economic growth
- Maintain security and resilience of the food supply chain
- Reduce waste generation
- Reduce negative impacts of the food supply chain
- Increase socio-economic benefits of food production and consumption to promote the availability and uptake of quality healthy food.

Current evidence activity delivered through the Resource Efficient and Resilient Food Chain (RERFC) Research Programme. This Programme has a post-farm gate focus from primary production (mainly post-harvest) to consumers and addresses priorities around increasing food industry competitiveness and growth, maintaining resilience of the food supply, and supporting food production sustainably. Requirements underpin policy development, problem-solving and innovation to support competitive, resilient and efficient food manufacturing, retail and distribution; promote reducing and recycling waste throughout the agri-food chain, and enhance the nutrition, safety and quality of raw food materials and products. The programme also addresses reducing the carbon footprint of the food supply (including greenhouse gases), food chain security, consumer and supply chain insight, attitudes and behaviours towards food prices, food security, local food, seasonality, provenance and methods of production.

These priorities are closely aligned with the wider research agenda set by the Government Chief Scientific Advisor's UK Food Research and Innovation Strategy, Government Food Strategy and Evidence Investment Strategy priorities to achieve a sustainable and secure food supply. They also align with the Department's Business Plan actions to support and develop British farming and encourage sustainable food production and support a strong and sustainable green economy, resilient to climate change).

The Programme complements wider government evidence activities on reducing waste, influencing behaviour and promoting healthy eating to tackle obesity and is developed in coordination with other Government Departments, Devolved Administrations (including the Welsh Assembly Government as part of a shared England and Wales evidence budget), Research Councils, the agri-food industry, the science community and third sector.

## 2.3 Current investment in evidence

The Farming and Food R&D Programme provides evidence to support policy making, solving problems and identifying future issues to support and develop British farming and encourage sustainable food production. There are 4 cross-cutting programmes (Sustainable Farming Systems and Biodiversity (SFSB), Resource Efficient and Resilient Food Chain (RERFC), Sustainable Water Management (SWM) and Agriculture and Climate Change (ACC).

The Resource Efficient and Resilient Food Chain Programme (RERFC) provides most of the evidence to support food policy to secure a competitive, secure, healthy, resilient and sustainable food supply. SFSB, SWM and ACC Programmes also contribute to this evidence base e.g. through activity to support reducing greenhouse gases across the whole supply chain, increasing sustainable production (pre-farm gate), reducing water footprint of UK produced food and reducing waste in the supply chain.

Activity to encourage opportunities for increasing competitiveness and growth post farm gate is supported mainly through collaborative work with industry to improve food quality (raw materials

and ingredients), increase resource efficiency in food manufacturing, processing and at retail, and reduce waste in the food chain. Some research and development on improvement of fresh produce and raw material quality through breeding, genetics (crops, livestock, horticulture) and agronomy to support reduction of post harvest losses (e.g. due to mycotoxins) is supported in the SFSB programme. Activity on genetic selection for improvement of soft fruit and meat quality to reduce environmental impacts and options for recycling food waste is being developed within the RERFC programme.

Specific projects on food security and ensuring food chain resilience from a UK and global context are supported in the RERFC programme through economic analysis, insight and behavioural work to understand risks to businesses across the supply chain and how these are influenced. This is supported by cross-cutting evidence activity undertaken by the Environmental Behaviours Unit, economics and statistics team building on established food and social science datasets (e.g. Family Food Survey) and in house analysis of external evidence to develop sustainable food indicators.

Environmental research including life cycle analysis of commodities, foods and water foot-printing (supported in SFSB, RERFC and SWM programmes) and development of metrics informs the potential for reducing the environmental impact of the food chain. This is also supported by cross-cutting activity in the ACC Programme on improving understanding resilience across the food chain to climate change.

Evidence underpinning policy on sustainable production and consumption gate is supported in the RERFC programme by socio-economic research to understand the impacts of attitudes, behaviours and practices across the food chain. This includes understanding the role of the supply chain and consumers in supporting a low carbon food chain, drivers, synergies and barriers to sustainable production and consumption and how these can be influenced to drive changes in the supply chain. Activity includes research to increase uptake of low carbon lean thinking in different supply chains, understanding and engaging with different food chain sectors on environmental impacts, promoting best practice, and understanding and mapping food waste in the supply chain to support policy on meeting waste reduction targets.

Evidence activity funded by Waste Evidence and Sustainable Consumption and Production programmes also informs activity. Food Policy Unit has also commissioned short projects to inform industry engagement on these issues through a small consultancy spend.

The RERFC Programme also supports multi-disciplinary projects aimed at increasing confidence about where food comes from and reconnecting society with food through society's engagement with food production. Activity includes building on evidence to characterise a healthy low impact diet, understand impact of uptake of these diets, and how to influence consumer attitudes and behaviours towards healthy sustainable eating (includes seasonal and local food) and work to support food labelling policy. The latter is also underpinned by the Food Authenticity programme which provides research and development to support the enforcement of food labeling and standards legislation through the development of methods that can determine whether foods are correctly labeled.

A small amount of special economics research funding ("SERPS") is invested each year in building economic evidence on food policy questions such as improving the evidence on the cost to industry of changing labels, modelling the drivers and prospects for food inflation, obtaining estimates of consumer responses to price changes, and work to underpin evidence on consumer attitudes to food. This latter work aims to directly link food purchasing patterns with consumer attitudes to food issues such as health, environmental sustainability, social welfare (e.g. fair-trade), sustainable fish, British/local produce, and animal welfare.

## **2.4 Identifying and prioritising new evidence needs**

*New evidence needs*

Evidence needs are continually developed and prioritised to meet food policy priorities as they evolve to deliver the Department's immediate and long-term priorities. Areas will focus on Business Plan priorities around competitiveness, economic growth, resilience, and increasing production sustainably and requirements will depend on the implementation of the Spending Review. Current requirements are listed in section 2.3.

New evidence needs will build on the existing programme, and complement wider activity (section 5.1 refers) and will be prioritised at Director level to align with the Business Plan and Ministerial priorities for the Department. Food Policy Unit's Food Strategy evidence review (see Annex) and Programme Management Group outputs will inform priorities and external consultation with industry, other funders (including via Defra-led food coordination group) and the wider scientific community provide a mechanism for external challenge.

**Short-term needs** – These are framed by the immediate priorities in the Business Plan–Work in 2011/12 will focus on evidence needs to support a competitive, profitable and resilient food sector and low carbon food chain through increasing resource use efficiency (energy, water, waste), improving raw material quality and understanding economic issues affecting the food chain sectors, business drivers, changes in business environment, resilience and risks to food supply. Activities will focus on where food industry growth can be achieved and identifying and overcoming barriers to supporting a sustainable economy.

The programme will also seek to reduce impacts of food production by strengthening the evidence base on environmental metrics and identifying factors influencing supply chain attitudes, behaviour, and practices to drive changes in the supply chain. Work will also support assessing the impact of new policies.

Understanding consumer attitudes and behaviour will support priorities around increasing consumer confidence about where food comes from, and reconnecting society with food through engagement with food production. Evidence to support enforcement of labelling and food standards legislation, provision of information on sustainable eating and understanding motivators and barriers to consuming a more sustainable diet will contribute to these priorities.

Economic and other analysis is needed to appraise research priorities, identify and assess the rationale for policy action, present impact assessment of policy options and evidence of what behaviour change interventions are likely to influence the food chain and their cost-effectiveness. Analysis will focus on economic issues around growth, exports, production and food chain business needs.

**Long-term needs** – To build on the above and gather evidence on longer-term issues including water scarcity, climate change adaptation, demographic and social change and the impact of these on food consumption, food systems and global food trends. Horizon-scanning activities and outputs emerging from the Foresight Reports (Food and Farming Futures) will inform future needs. Ex –post evaluation of policy, its rationale, cost-effectiveness and benefits are also likely to become important. Development of methods to verify food quality and origin claims is an emerging policy, as is improving the effectiveness of labelling and food standards enforcement by training public analysts.

## 2.5 Secondary benefits of evidence activities

### *Contribution to other Defra and Government policy areas*

The Evidence Programme contributes to the development of policy in several Defra areas apart from Food Policy Unit including Crops Hub, Livestock Hub, Waste Strategy, Sustainable Production and Materials, Sustainable Behaviours Unit which is coordinated through the Programme Management Group. The Programme's evidence on improving resource efficiency

and reducing waste complements the Waste Resources Action Plan (WRAP) Programme on waste reduction across the supply chain. Priorities on promoting sustainable consumption and uptake of quality food and healthy low-impact diets support the UK Government's approach to tackling obesity (Department of Health led). The Programme also provides methods to support the Food Standards Agency's activities on food fraud and enforcement of legislation on food labelling and standards.

Economic and statistical evidence has a wider reach in Defra policy development and helping public debates on food to be evidence-based, in particular through the Food Security Assessment, sustainable food indicators and the Food Statistics Pocketbook. Defra's Family Food Survey provides a very rich data source that is accessed by external researchers and academics through the national Data Archive. The Food Standards Agency and the Department of Health use the statistics for contextual information about diet. The Food Standards Agency in Scotland uses the survey in their long running project monitoring the Scottish diet.

#### *Coordination and knowledge exchange*

Coordination and knowledge exchange with other funders on research informing the Programme is achieved through a variety of routes. Sections 4.2 and 5.1 refer.

Defra co-funding of a new TSB-led Sustainable Agriculture and Food innovation Platform will provide a mechanism to ensure translation of research outputs from the programme into practice to promote a competitive, resource efficient and resilient food chain. Defra is also working in partnership with other funders to take forward multi-disciplinary and coordinated research and development on food through the BBSRC-led Global Food Security research programme.

The aims of the Evidence Programme are consistent with the current EU Framework 7 Programme on food quality, diet and health. Defra is proactively participating in Framework 8 programme discussions to ensure that research priorities are aligned. Opportunities will be sought to facilitate collaborative R&D projects designed to bring outputs from the Framework projects into the UK arena. Contact with existing and forthcoming European Programmes will be maintained via the Defra EU and International Team (SEG Evidence Programme) and in liaison with other Government Departments (GoScience, BBSRC).

## **2.6 Alignment to long-term evidence challenges and Business Plan objectives**

As food consumed within the UK is set within a global context, long-term evidence needs will embrace climate change adaptation, water scarcity, demographic and social change and the impact of these on food consumption, food systems and global trends.

The evidence needs identified in section 2.4 directly contribute to meeting the long-term challenges identified in Defra's Evidence Investment Strategy to deliver a sustainable and secure food supply.

#### Evidence supports

- Increasing competitiveness and economic growth of businesses through increased resource efficiency and innovation
- Maintaining security and resilience of the food supply chain, identifying risks to the food supply and harnessing the power of industry, third sector and consumers to bring about change
- Driving a 'zero waste agenda' by reducing and recycling waste across the supply chain
- Reducing negative impacts of the food supply chain including how food can be produced and sold in the most sustainable manner
- Reducing the environmental and socio-economic impact of food production and consumption
- Promoting the availability and uptake of quality healthy food by increasing consumer confidence in food (including around food authenticity), society's engagement with

food production and sustainable healthy diets.

These areas directly reflect Departmental Business Plan priority 1 to support and develop British farming and encourage sustainable food production by enhancing the competitiveness and resilience of the food chain to help ensure a secure and environmentally sustainable and healthy food supply.

Areas are also aligned with cross-cutting aspects of priority 2 (to enhance the environment/mitigate greenhouse gas emissions) and priority 3 to support a strong and sustainable economy, resilient to climate change (encouraging business innovation, growth, ensuring resilience, reducing waste and promoting a low carbon economy).

### **3. INTERNAL CAPABILITIES - USING DEFRA'S EVIDENCE SPECIALISTS**

#### **3.1 Range of knowledge disciplines needed**

The scope of evidence activities within the Food and Farming Group covers a broad range of sciences from analytical (e.g. Life Cycle Assessment, modelling, molecular science (e.g. genetic improvement, DNA techniques (food authenticity)), crop and livestock science, biological (including food science, nutrition), technological/food engineering and social and behavioural research (insight, attitudes and behaviours).

The science team relies on in house expert knowledge and expertise on biological sciences (including molecular), food, natural and social sciences, economics and statistics and consults experts externally and in other Departments where necessary.

#### **3.2 Access to internal specialists**

Access to scientific analysis and expertise and the procurement of evidence through appropriate R&D is provided by the Farming and Food Science, economic and statistics teams.

#### **3.3 Future resource needs and filling gaps in expertise**

To meet evidence needs to support delivery of the business plan we will continue to need multi-disciplinary skills mix in section 3.1 to support less-well developed evidence areas e.g. resource efficiency and reducing GHG emissions and impacts of production and consumption, influencing behaviour change, food chain resilience and sustainable healthy diets – requiring expertise in food, environmental and natural science, social science, stats, economics and engineering. The balance between disciplines may change as the focus on competitiveness and resilience strengthens. There is also a role for operational research to help disentangle interconnections to support focus on specific areas which could bring benefits to multiple objectives.

The flexible way of working of the Science Team across 4 Evidence Programmes covering farming, food, water and climate change maximises the skills base available to inform the Programme. Economists, Statisticians and Social Scientists within FFG also work collaboratively across these programmes.

### **4. EXTERNAL KNOWLEDGE SUPPLY AND PARTNERS**

#### 4.1 Strategic external capabilities and suppliers

The supply base for the Food Chain Evidence Programme is currently drawn from BBSRC Institutes, Universities, Defra agencies and a wide range of consultancies. Projects also utilise in house long-term data sets (e.g. Family Food Survey, Defra statistics) to support work on food security and behaviour.

Several research centres are restructuring or merging with universities and there may be implications for capabilities and expertise. There is also a skills gap in the agri-food research area which cannot be easily filled by other research providers. Partnership working will be key to ensuring that there is a supply of skilled people to match demand.

To address global food security and sustainable food production objectives in the future we need scientific skills at the organism level with experience of working within the farming system and expertise in animal sciences, weed science, plant pathology, entomology, crop breeding and agronomy.

On wider socio-economic research capabilities on food, there is generally a strong potential and diverse supply base, in particular some of the major universities and serious consultancies. In addition FFG economists retain a strong relationship with the Agricultural Economics Society with which it jointly promotes a one-day conference each year to showcase key research on policy relevant to food and farming topics.

There is a growing demand for analytical resource to support the production and growth agenda around the whole food chain. There is also a need for specialist technical support for method development to allow for the enforcement of legislation covering labelling requirements and compositional standards for food.

#### 4.2 Leverage and partnerships

Section 2.5 refers. We already work in partnership with other Government Departments, Agencies, the Devolved Administrations (including the Welsh Assembly Government who share an England and Wales evidence budget), Research Councils and industry to deliver evidence across the scope of the Programme, including sharing research needs outputs, data sets and knowledge on food composition, healthy eating, waste and behaviour. Defra is working with other public funders via the Food Research Partnership and Global Food security Programme to prioritise and coordinate research on food. At an informal level collaborative research interests on food are brought together via the Defra-led food coordination group and taken forward through regular engagement with other funders including Devolved Administrations at a project level.

The new TSB Innovation Platform on Sustainable Agriculture and Food (co-funded by BBSRC and Defra) provides a key vehicle for engaging private sector investment in collaborative applied research and development. The TSB Knowledge Transfer Partnership provides leveraged funds to support knowledge transfer in the food and drink sector (SMEs focus).

At a wider level the Programme is also linked into EU Framework Programmes to support research on food chain sustainability e.g. ERANET on sustainable production and consumption (SUSFOOD) and ICT-Agri ERANET (supporting technology/robotics in agri-food) which provides a leverage opportunity to deliver a UK focus in the EU dimension. As part of the UK representation, Defra is also linked into the European Joint Programming Initiative on Food security, Agriculture and Climate (FACCE).

The GoScience Foresight project on Farming and Food Futures has also provided valuable opportunities for Defra to feed in its research and expertise (e.g. the Food Security Assessment), to influence the direction and quality of the work, and to access a range of new

and established evidence on global food security issues.

### **4.3 Use and value of advisory bodies and external specialist advisers**

Public funders, scientific and food industry experts, and stakeholder interests are consulted to prioritise and shape food evidence needs and evaluate results. This ensures we deliver targeted research which takes account of existing activity and addresses key gaps and technological challenges to develop solutions and support policy development. Outputs from Food Task Force (Food Research Partnership) and sub-groups lead by the Government Chief Scientific Advisor also inform activity. Section 4.2 refers.

The Council of Food Policy Advisors and the Fruit and Vegetable Task Force have shaped evidence to address priority policy areas and Ministerial priorities and anticipate input from similar future expert groups and also potentially the Scientific Advisory Committee on Nutrition on delivering low-impact healthy diet policy. Priorities for research on food authenticity are established with the aid of the interdepartmental and stakeholder Authenticity Steering Group and its advisory body on analytical methods, the Authenticity Methods Working Group.

Farming and Food Group (FFG) economists benefit from periodic Agricultural and Environmental Economics Academic Panels in prioritising economic analysis and research. FFG Economists are also represented at the Organisation for Economic Co-operation and Development (OECD) where we monitor, comment and utilise OECD research and analysis on international farming and food issues, share knowledge and in some areas (e.g. modelling) collaborate quite closely. Many OECD projects are relevant to Defra's interests on farming and trade, but increasingly also on food issues.

## **5. MEETING NEW EVIDENCE NEEDS**

### **5.1 Overall approach to meeting your evidence needs**

The four Programme Management Groups for farming and food science (Resource Efficient and Resilient Food Chain; Sustainable Farming Systems and Biodiversity, Agriculture and Climate Change; Sustainable Water Management (respective Evidence Plans refer) will take a strategic view of short term and strategic research requirements and evidence gaps across Defra's policy interests on food, with overall priorities agreed annually by a Farming and Food Cross-Cutting Steering Group (Director-level).

To inform the direction of research investment and ensure alignment with policy requirements, prioritisation of future evidence needs will be determined through regular engagement with policy SROs, policy and evidence leads and specialists (in natural science, social science, economics and statistics).

To ensure a coordinated and multi-disciplinary approach to delivering the evidence, existing working relationships and mechanisms for coordination of food research with other funders and industry will be exploited to maximise impact and value for money including the Food Research Partnership, TSB-led Sustainable Agriculture and Food Innovation Platform and, going forward, the Global Food Security Programme [sections 2.4 and 4.2 refer]. Leveraged funds in areas such as food engineering, manufacturing and processing through TSB-led Knowledge Transfer Partnership and via collaborative knowledge exchange projects will also support knowledge transfer in the food sector (including SMEs). Other exploitable links and engagement opportunities with industry include levy bodies (AHDB) and food industry trade and research associations.

There will also be continued participation in EU Working Groups and ERANETS to address food security challenges on sustainable food production and consumption (SUSFOOD) and support innovation in farming and food engineering (ICT-Agri ERANET) and more formally through the EU Joint Programming Initiative on Agriculture, Food and Climate Change.

Quality assurance of the evidence through its development and delivery will be achieved through making use of available evidence/analysis, independent peer-review and expert external challenge to ensure it is fit for purpose in line with standard Defra procedures. Expert consultation through stakeholder workshops have been used to good effect in developing and evaluating the evidence base, UK Food Security Assessment and Food Strategy Indicators. Contractors will continue to be encouraged to publish outputs in peer-reviewed journals.

Much of the primary statistical evidence, including Defra Family Food survey, is required to conform to high statistical standards as laid down in the national Statistics code of practice. These statistics are subject to auditing by the UK Statistics Authority.

The Programme Management Group, policy seminars and workshops will facilitate timely dissemination of outputs to support policy development. Success measures for Programme outputs will be defined by a robust evidence base and outputs which contribute to a well-defined policy outcome.

## 5.2 Evidence investment forecast

Investment will decrease in line with agreed SEG December 2010 budget allocations for 2011/12 to 2014/15.

## Annex

### Key references supporting the current state of knowledge [\[Return to Section 2.1\]](#)

#### FPU Evidence Stock-take and research database [\[appended\]](#)

- [The Foresight Project: The Future of Food and Farming](#)
- [Science for a New Age of Agriculture \(Taylor Review, September 2010\)](#)
- [Food Industry Sustainability Strategy](#)  
[\(http://www.defra.gov.uk/foodfarm/policy/foodindustry/\)](http://www.defra.gov.uk/foodfarm/policy/foodindustry/)
- [Food Strategy](#)  
<http://www.defra.gov.uk/foodfarm/food/strategy/index.htm>
- [UK cross-government research strategy](#)  
<http://www.bis.gov.uk/assets/biscore/goscience/docs/c/cross-government-food-research-strategy.pdf>
- [Food Stats Pocketbook](#)  
<http://www.defra.gov.uk/evidence/statistics/foodfarm/food/pocketstats/index.htm>
- [Family Food Survey](#) (  
<http://www.defra.gov.uk/evidence/statistics/foodfarm/food/familyfood/index.htm>)
- [UK Food Security Assessment](#)  
<http://defraweb/foodfarm/food/security/index.htm>
- [Link to economic research projects](#)

[\(http://ww2.defra.gov.uk/corporate/evidence/series/\)](http://ww2.defra.gov.uk/corporate/evidence/series/) **Food Strategy Indicators** (<http://defraweb/foodfarm/food/strategy/indicators.htm>)

## Food Strategy Evidence Review - High level outputs from the stock take

### **Theme 1 – Enabling and encouraging people to eat a healthy sustainable diet**

- There is broad statistical evidence on the impact of food inflation on lower income households, and further work is ongoing to establish consumer purchase patterns in different population groups and explore the cost of a healthy diet which will inform the understanding of food availability, access and affordability.
- There is good ground work to show that geographical access to shops is not a barrier in terms of access to food, but there is more work to be done in terms of making a sustainable healthy diet more accessible. However, this cannot be done without first identifying what a sustainable healthy diet looks like.
- Our evidence base in support of a definition of a healthy sustainable diet is weak, and work is being initiated to address this.
- Once a healthy sustainable diet is defined, then the behavioural barriers and drivers for adopting a low impact diet and food choice (including attitudes and behaviours on food handling, eating less, and eating less meat/dairy) will be easier to identify.
- The environmental impact of a healthy sustainable diet has not been quantified, and again, this will be easier to do once it has been defined.

### **Theme 2 – Ensuring a resilient, profitable and competitive food system**

- The Food Strategy indicators provide us with measures of performance pre and post farm gate in this theme.
- Research is underway on infrastructure resilience, but resilience awareness within the industry is rated as amber in the Food Security Assessment.
- Resource use efficiency is linked to both resilience and profit, and there are gaps in our understanding in terms of what technological steps are necessary to increase resource use efficiency post farm gate and what the barriers/incentives are.
- Quantified and categorised evidence of the total regulatory burden on the post-farm gate food industries is needed.

### **Theme 3 – Increasing food production sustainably**

- Indicators measure progress in water abstraction, soil quality, biodiversity and sustainable sourcing of fish

- Gaps include: developing strategies to reduce agriculture's impact on water quality and to comply with the Water Framework Directive (e.g. tradeoffs between water resources and use in relation to UK food security, climate change adaptation and environmental impact of agriculture production); evaluating the effect of soil degradation including that caused by agriculture, climate change impacts and spreading waste materials on land; value of certification schemes for fish in terms of environmental, economic and social sustainability and alternative sources of marine protein.

#### **Theme 4 – Reducing the food system's greenhouse gas emissions**

- A significant body of research is being funded looking at improved agricultural practices both in terms of enabling the agricultural sector to fulfil its potential in contributing to climate change mitigation and also adapt in order to manage the impacts, whilst ensuring a sustainable, secure and healthy food supply.
- To underpin policy development in order to achieve a significant reduction in GHG emissions, Defra is funding a GHG platform to enable a very significantly improved inventory, capable of taking into account mitigation techniques (subject to ministerial approval). This is complemented by life cycle assessments of key agricultural commodities which are being further refined.
- Research has been conducted on estimating and comparing product lifecycle GHG emissions. PAS 2050, a publically available specification has been developed and is being used as a base document for the development of ISO and WRI standards. Further work is required to assess the uptake of PAS 2050 by industry including what the barriers to carbon reduction behaviours are such as data availability/quality and cost.

#### **Theme 5 – Reducing, reusing and reprocessing waste**

- The evidence base has identified that households make the largest contribution to food waste within the supply chain, followed by the manufacturing industry. To date, the research focus has addressed policy around influencing food producers and consumers to minimise waste. The mapping of industry waste has also been used to support policy on diverting food waste from land fill and inform development of road maps for key products.
- Co-funded work with industry has targeted waste reduction through better process design, sensors and control systems as well as reduction of post consumer waste by means of modifying raw materials, reducing spoilage and extending shelf life. Pre- farm gate research has focused on meeting market demands by improving raw material quality through plant breeding and reducing waste in meat supply chains.
- There is more work to do in terms increasing our understanding of the environmental impact of the food supply chain as a whole (including waste), and

the food service sector, distribution and wholesale sectors require particular attention.

- Other areas where the evidence base is less well developed include the impact of behaviours and practices such as trading relationships and forecasting.
- Anaerobic digestion (AD) is a proven system for producing energy and reducing green house gas emissions. Research has established that AD is the best management option for food waste (provided it is separated from green waste, otherwise composting is a better alternative). Evidence is lacking on the impacts of applying digestate (and compost) to land since it will have a different composition from organic materials which have been traditionally applied to land, such as manure, slurry or sewage sludge. WRAP is commissioning research jointly funded with Defra to assess the impacts and agronomic benefits of applying digestate and compost to land, which will deliver guidance on best practice and provide confidence in the use of these materials.
- There are also evidence needs around improving food quality and reducing post harvest losses to minimise waste; exploring recycling options of food waste; crop protection to decrease losses in yield and quality; and resource use efficiency through genetics, crop management and animal husbandry.

#### **Theme 6 – Increasing the impact of skills, knowledge, research and technology**

- There are a number of mechanisms for joining up and integrating research across Government. Translation of research into practice will be assisted by the new Technology Strategy Board Sustainable Agriculture and Food (SAF) Innovation Platform.
- Greater definition is required around the skills needs post farm gate.

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