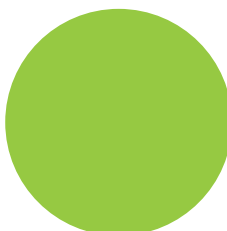
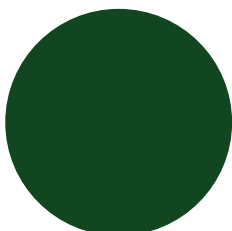


Priority research questions for the UK food system



The Priority Questions Exercise

The UK's food security is high on political, food industry, societal and academic agendas. To help identify key research challenges aimed at improving the UK food system's efficiency and effectiveness in a global context, the UK-Global Food Security (GFS) programme launched a project on the **priority research questions for the UK food system**.

The 'prioritisation phase' involved the wide range of actors engaged in the full suite of food system "activities" along the food chain (i.e. producing, processing, packaging, retailing and consuming); and others interested in food security or other socioeconomic and environmental "outcomes" of these activities. Emphasis was placed on incorporating a wide range of 'world views' from different stakeholder groups: policy, private sector, non-governmental organisations, advocacy groups and academia.

From an initial list of 820 questions submitted by a wide range of stakeholders involved in the 'food' sector, project participants identified 100 priority research questions by an iterative process of voting and discussion at a multi-stakeholder workshop. These 100 questions were then sorted into ten themes relating to food system activities and outcomes, and the 'top' question for each of the 10 themes identified by a second voting exercise.

In addition, four different stakeholder groups (primary production; food industry and retail; governmental policy; and NGOs/advocacy) each selected, from the list of 100 questions, the top five questions from their varied perspectives.



All images in this booklet are from Thinkstock (2014), except page 4 from Frank Havemann and the image of food waste on page 1 from Shutterstock.

Top questions for the UK Food System for each of the 10 themes

Producing – Environment & Resources How can the sustainability of UK primary production be improved without expanding our social and environmental footprint overseas?

Producing – Innovation & Context How can food supply be maintained as the functionality or use of pesticides, anti-microbials, antibiotics and biocides decreases?

Processing How can the fat, sugar, preservative and salt content of foods be reduced while ensuring that palatability is maintained, waste is minimised, and food remains safe and does not spoil?

Logistics, Packaging & Safety How will novel, emerging and re-emerging pathogens be prevented, detected and controlled rapidly and accurately to enhance food security?

Retailing What food information system would allow UK consumers to make an informed choice about each product's impact on different aspects of sustainability (environmental, economic, health and social)?

Affordability & Consumption Which intervention (or combination of interventions) would be most effective in achieving changes in consumption decisions and which types of intervention (e.g. awareness raising campaigns, choice editing, education, legislation or regulatory) are most appropriate for specific contexts and decisions?

Nutrition How can nutrition be improved based on understanding of the interactions between genetics, epigenetics, environment and diet?

Waste How can ways of influencing behaviour be most cost-effectively designed and targeted to reduce food waste in UK homes?

Whole System – Environmental Context What are the opportunities and risks for UK food supply and primary production in responding to climate change?

Whole System – Policy Context Where the UK food system has demand for, and command of, resources in other parts of the world, how can associated ethical, political and other impacts be addressed?

Primary Production Stakeholder Group

Top five research priorities for the UK food system selected by the primary production stakeholder group

- How can the sustainability of UK primary production be improved without expanding our social and environmental footprint overseas?
- How should UK soils be managed for optimum productivity and environmental protection in field vegetable, arable and grassland livestock systems in the long term?
- Given the UK's geographical imbalance between limited and excess water supplies, how can water resources be better managed to improve water-use efficiency for food production?
- How can primary food production be sustainably intensified whilst maintaining or enhancing the nutritional value of those food items?
- What are the barriers to the further development and uptake of precision technologies, smart engineering and automation by producers to enhance the efficiency and sustainability of the food system, and how can they be overcome?



Food Industry and Retail Stakeholder Group

Top five research priorities for the UK food system selected by the food industry and retail stakeholder group

- How can the fat, sugar, preservative and salt content of foods be reduced while ensuring that palatability is maintained, waste is minimised, and food remains safe and does not spoil?
- How can food hygiene and safety be ensured as chemistry and chemical engineering in manufacturing processes (e.g. cold plasma, high pressure processing, non-compressor refrigeration) change to meet future economic, social and environmental drivers?
- How will novel, emerging and re-emerging pathogens be prevented, detected and controlled rapidly and accurately to enhance food security?
- How can smart packaging be used to reduce food waste and maintain or enhance food safety?
- What food information system would allow UK consumers to make an informed choice about each product's impact on different aspects of sustainability (environmental, economic, health and social)?



Governmental Policy Stakeholder Group

Top five research priorities for the UK food system selected by the governmental policy stakeholder group

- Which intervention (or combination of interventions) would be most effective in achieving changes in consumption decisions and which types of intervention (e.g. awareness raising campaigns, choice editing, education, legislation or regulatory) are most appropriate for specific contexts and decisions?
- Which UK groups (e.g. socioeconomic, regional) are, or are likely to become, food insecure in the near future, and why?
- What factors influence the allocation of food within UK households, and what are the implications for health?
- How can UK food supply and primary production adapt to more extreme weather events?
- What are the opportunities and risks for UK food supply and primary production in responding to climate change?



NGO and Advocacy Stakeholder Group

Top five research priorities for the UK food system selected by the NGO and advocacy stakeholder group

- Which intervention (or combination of interventions) would be most effective in achieving changes in consumption decisions and which types of intervention (e.g. awareness raising campaigns, choice editing, education, legislation or regulatory) are most appropriate for specific contexts and decisions?
- How can food prices or other financial mechanisms account for the environmental and health externalities in food production and consumption?
- What dietary choices would UK consumers make if their intake of meat and dairy products was reduced, and what impact would this have on health and sustainability?
- Under which circumstances are the various channels for using food waste (including anaerobic digestion, feeding it to animals, composting, land-spreading etc.) socially, environmentally and economically preferable?
- How can ways of influencing behaviour be most cost-effectively designed and targeted to reduce food waste in UK homes?



Answering the priority research questions

The priority questions identified will help inform the research agenda to improve the effectiveness and efficiency of the UK food system. They will also help to inspire the new interdisciplinary and multi-sectoral research partnerships needed to address this important agenda.

The **next stages** are for interested parties to jointly:

1. Identify which questions can be addressed by synthesising existing knowledge, and which need new research;
2. Identify funding mechanisms for undertaking new work;
3. Build academia-industry partnerships to develop and implement research; and
4. Integrate the answers to help analyse synergies and trade-offs among multiple social, economic and environmental objectives.

Turning answers to the questions into improved practice and policy outcomes is itself a further challenge, but this can be overcome given improved understanding of interconnections in the UK food system as a whole.

The 'Priority research questions for the UK food system' project is a collaboration among GFS partners and a wide range of other stakeholders. This work was co-funded by the UK Global Food Security Programme partners, NERC, Defra and BBSRC and led by the former NERC Food Security Leader, Dr John Ingram. Full results from the 'prioritisation phase' of the project are published in a multi-authored paper: Ingram JSI et al. 2013. Priority research questions for the UK food system. *Food Security*, volume 5, pp 617-636.

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