

COMMITTEE PAPER FOR DISCUSSION

ADVISORY COMMITTEE FOR NOVEL FOODS AND PROCESSES

HORIZON SCANNING

ISSUE

The Committee has a horizon scanning role which is to be performed on a regular basis in order to identify emergent risks and inform the future direction of the FSA's work in these areas. This item seeks to identify and discuss with the Committee new and emerging technologies, trends and products which could impact on food production, consumption and safety.

The Committee is asked to focus on new innovations which could translate into regulated novel and genetically modified foods requiring authorisation, in areas which have not previously considered by the Committee. It aims to explore the potential risks to animal and human health associated with these technologies and identify areas where increased capability is required. Additionally, discussions should consider how wider changes impacting the food system such as climate change related issues and developments in big data will affect novel technologies, products and trends.

BACKGROUND

1. The focus of the [FSA strategic plan for 2015-2020](#) is to put consumers first by ensuring food is safe and that we have access to an affordable healthy diet and can make informed choices about what we eat, now and in the future. This is supported by using science, evidence and information.
2. The strategic plan also includes a commitment to improving the way the Agency uses horizon scanning to better protect the long-term interests of consumers in relation to food. As part of this commitment the Agency asks that all the Scientific Advisory Committees (SACs) continue to build and apply horizon scanning, within their own areas of expertise. This will help the FSA to better understand what the future might hold for the food system and for consumers' interests in relation to food.
3. In 2019 the Science Council Working Group 3 on Food System Risks and Horizon Scanning commissioned work to be carried out by RAND Europe, looking at better understanding the current global food system and its emerging issues, the outputs of the outputs can be found [here](#). This project resulted in a set of eight thematic briefs being highlighted, which are emergent areas for future observation. These included alternative food production (e.g. aquaculture), alternative proteins, consumers, contaminants, synthetic biology,

genomics, packaging and food waste and sensing and data-driven decision making.

4. The [final working group 3 project report](#) by the Science Council, built upon the RAND Europe outcomes and addressed the question “What should the FSA do to improve its horizon scanning and its understanding of the global food systems risk (and opportunities)?”. Within its advice it highlighted the use of systematic gathering and formalisation of insights from SACs.
5. An insight into emerging consumer food trends was captured in a 2018 social media open listening project commissioned by the FSA. The [final research report](#) identified improving or maintaining health as a core focus, which was fuelled by an interest in new foods, in addition to the fundamental values of meat reduction and sustainability.
6. Previous horizon scanning activities were performed by the ACNFP at their Committee meeting in July 2015 and at the SACs Discovery Day June 2019, the outputs of which are provided as **Annexes A and B**.
7. This horizon scanning activity aims to build upon the outcomes of the SACs Discovery Day horizon scanning activity by examining the developing areas and technologies of novel and GM food/feed identified during this event in the context of the Committee’s work. These have been grouped into innovation themes for further in-depth discussion with the ACNFP.
8. The outputs from this item will be used to inform the Secretariat of emerging areas in which the ACNFP may require additional support or expertise, and alert FSA policymakers to developing areas.

Emerging or near market technologies

9. In previous years the Committee has considered a number of emerging or near market technologies that have a role; or potential role in food production. These include: cloning, nanotechnology, new protein sources (e.g. insects and in vitro meat production), GM animals and new techniques for the genetic manipulation of plants. Other areas of potential importance which have not yet been fully considered by the ACNFP include synthetic biology, personalised diets, relevance of genomic data in influencing the food chain and 3D printing.

SACs discovery day outputs

10. Key relevant outputs were captured in the areas of climate change, changing diets and new and emerging technologies. Changes in climate will likely have a wide range of impacts on food safety considerations such as pathogen burden and toxin or heavy metal content, whilst an increased focus on environmental sustainability and reduced waste is leading to changes in diet (e.g. alternative

protein sources) and changes to industry practices (e.g. recycled and alternative packaging).

Innovation themes

11. For the purpose of Committee discussions, the outputs of the SACs discovery day have been grouped into the following innovation themes. These will be considered further during this Committee item by small groups of members exploring each theme in turn, during independent parallel discussions facilitated by the Secretariat and brought together in a plenary session.
12. To assist with outputs of the discussions, the questions we are asking the Committee to consider for each innovation theme have been grouped to allow a cause, effect and barrier assessment, which will enable quick and accessible strategic prioritisation. 'Cause' establishes the remit of the new technology/product. 'Effect' looks at what considerations the ACNFP need to consider as a result of this new technology/product. 'Barrier' asks what barriers exist to prevent adoption of this technology/concept.
13. After the group discussion session, the plenary session will consider how the outcomes for the innovation themes will influence the Committee's work in future.
14. Following the meeting the Secretariat will collate the discussions on each innovation theme and use these to inform where further discussion would be useful to include in the ACNFP's work programme.
 - *New protein sources*
15. Non animal based protein sources are increasing in popularity, with alternative sources of protein coming in the form of plant proteins, insects and microorganisms. This is a rapidly expanding area ranging from animal free meat substitutes to alternative dairy and egg products. Additionally, new technologies are aiding in the development of cultured and genetic modified protein sources. Key issues highlighted in this area are the impacts of consumption of these new products upon nutrition, as well as their allergenicity and toxicity potential.
 - *Synthetic biology*
16. There is no agreed definition of synthetic biology, however commissioned European Commission Scientific Committees have defined synthetic biology as "the application of science, technology and engineering to facilitate and accelerate the design, manufacture and/or modification of genetic materials in living organisms". This includes six groups defined by the European Commission which are: genetic part libraries and methods, minimal cells and designer chassis, protocells and artificial cells, xenobiology, DNA synthesis and genome editing and citizen science. 'Next level' genetic modification, such as

the alteration of transcriptional networks, may have wide scale biological system impacts. Therefore, additional consideration is required on how best to assess the safety of next level GMOs and the role of a comparative approach for risk assessments for these types of modifications.

- *Sustainable food systems and the circular economy*

17. A focus on reducing waste and a move towards a circular economy may lead to novel foods produced as secondary products from food systems, or products such as edible food contact materials (e.g. edible water bottles). The potential impacts on food safety that may occur from use of these material such as changed contamination risks and increased allergen, toxicology and microbiological risks, require consideration.

- *Changing health food trends*

18. Health and wellness concerns are known to drive food trends and lead to changes in consumer demands. Recently these have included shifts towards increased personal responsibility for health, as well as foods or diets with perceived health benefits e.g. low sugar, gluten free. Advances in personalised DNA and microbiome testing have the potential to lead to 'personalised diets' and tailored novel or genetically modified food/feed, such as engineered probiotics.

COMMITTEE ACTION REQUIRED

- Committee members are asked to consider the developing areas of novel and GM food/feed and the new technologies detailed in the innovation themes, then to address in discussion groups the following questions.

Cause

- What are the key products/technologies in this innovation theme which you predict the Committee may have to deal with?
- Is this a new technology or a known technology being applied to a different area/product?

Effect

- What safety risks are associated with these new areas of innovation?
- What evidence is required to assess these risks?
- What impacts may developments in this innovation theme have on nutrition?

Barrier

- Based on your assessment of the risks, does the Committee have the current capability to address these risks? If not what new capabilities or guidance is required?
- What impacts will climate change have on developments within this innovation theme?
- What impacts will the increasing use of big data (e.g. whole genome sequencing) have on developments within this innovation theme?

Plenary discussion question

Group discussions will be brought together in a plenary session in which Committee members are asked to consider the following question:

- Which identified areas/new technologies do you see as being high priority for further Committee exploration?

**Secretariat
October 2019**

Annexes

Annex A: Food 2025 outputs of ACNFP horizon scanning (ACNFP/119/07).

Annex B: Scientific Advisory Committee discovery day horizon scanning Workshop outputs (OFFSEN).