Annual FSA Science Update

FSA 24/09/07 - Report by Julie Pierce, Director of Information & Science

1. Summary

1.1 This paper provides the annual update to the Board on the FSA's three core areas of science delivery: risk analysis, research & evidence and science infrastructure.

1.2 It presents an overview of progress made and impact delivered, since the last science update (December 2023) and provides an update on actions taken in response to the annual report of the Chief Scientific Adviser (CSA; June 2024).

1.3 It considers the FSA's future science needs, covering both short-term priorities (coming year) and areas for strategic development across the wider government Spending Review (SR) period and seeks views on the new Areas of Research Interest (ARI).

2. Introduction

2.1 This paper builds on the 2023 FSA Science Update (footnote 1). Previously published in December, this annual update has been brought forward to September to align better with the FSA's business planning cycle and reflect the greater focus on longer-term planning (allowing the Board early sight on future priorities). It also aligns with the annual report of the CSA, presented in June 2024 (footnote 2). Annex 1 provides an update on actions taken in response to that paper.

2.2 The FSA's science capability is delivered by a team of over 160 scientists and analysts, who sit within the Science, Evidence and Research Division (SERD), and with an allocated budget of £18.2M in FY24/25. More detail on how we deliver our science can be found in Annex 2.

2.3 While the SERD budget is flat compared to last year (£18M in FY23/24), inflationary pressures have reduced the funds available. This has mostly been absorbed through a combination of efficiencies and reprioritisation of external spending (including finding £600K of savings from our non-research evidence and science infrastructure budgets). This has enabled us to avoid further staff headcount reductions (maintaining overall FY23/24 levels) and protect critical/frontline roles (for example those associated with risk analysis; accounting for over 65% of all SERD staff resources). In addition, a specific increase of 5 new posts was authorised by the FSA's CEO in FY 24/25 to support risk assessment/market authorisations (with funding reallocated from other FSA budgets).

2.4 To support the FSA as a science and evidence driven organisation, SERD operates across three core areas of science delivery:

a) **risk analysis:** supporting both the FSA's risk analysis process and market authorisation programme. This is the largest area of science delivery.

b) **research and evidence:** covering our projects delivered externally and internally (via SERD).

c) **science infrastructure:** maintaining and building the scientific tools, capabilities and systems required to enable delivery of our science.

2.5 Progress against previous objectives (as laid out in the future look section of the 2023 Science paper) has also been considered. In last year's paper, the main forward priorities were listed under four themes, and these are listed below with reference to the relevant section in this paper, where progress is highlighted:

2.6 Improving evidence to better understand and control foodborne illness: with the focus on AMR (see paragraph 4.5 to 4.7).

2.7 Transforming our science capabilities to support regulatory reforms: focusing on analysis in support of core and change priorities (see paragraphs 4.25 and 4.26).

2.8 Sustaining and building our national surveillance and science capabilities: including the future labs plan (paragraphs 5.2 and 5.3), PATH-SAFE (paragraphs 4.11 to 4.14) and UKRI collaboration (for example, Food Safety Research Network) (paragraph 4.8).

2.9 Consumer interests: with the focus on consumer attitudes to novel foods/regulated products, imported food standards, and working with others to test interventions around healthy sustainable diet (see paragraphs 4.25 and 4.26).

3. Risk Analysis

3.1 The FSA's risk analysis process (RAP) places science at the heart of decision making and is delivered by SERD and Policy (with Policy leading). The overarching process of risk analysis and our progress across multiple prioritised policy areas is presented in the Risk Analysis Annual Review (Annex 3).

3.2 SERD supports the RAP through the provision of risk and safety assessments, and where appropriate, expert technical advice and evidence on economic and societal impacts. Our priority is to provide timely scientific input to incidents, but demand outstrips resource and therefore, in consultation with the wider organisation, all work commissioned is assigned a priority level (high, medium and low). Annex 4 provides a list of published risk and safety assessments.

3.3 There are 3 evidence workstreams which routinely feed into the RAP: incidents, risk & impact assessment and market authorisations (regulated products). Each is considered in turn below:

3.4 **Incidents:** over the last 9 months, we provided incident risk assessments for 111 of the more complex incidents faced by the FSA. This is within our average delivery demand of approximately 150 per year. In 2024, we supported several complex outbreaks simultaneously, with key examples including:

3.5 A risk assessment for a Salmonella typhimurium outbreak in Denmark, with links to a UK meat cutting plant and a previous outbreak with over 300 cases, led to an effective product withdrawal.

3.6 Technical advice supporting the response to the STEC O145 outbreak with nearly 300 confirmed cases leading to recalls of lettuce and sandwiches due to epidemiological links with outbreak cases.

3.7 Listeria monocytogenes cluster of 3 confirmed cases of listeriosis and 2 deaths, linked to sandwiches supplied to hospitals. We drafted a risk assessment with the outcome of a medium risk, which directly informed risk management action.

3.8 A risk assessment on the risk posed by eating fish from Lough Neagh, Northern Ireland, after a widespread cyanobacterial bloom.

3.9 Response to the confirmation of influenza of avian origin in US dairy cows and assessment of the risk to UK consumers from imported milk, dairy products, colostrum and colostrum-based products originating from US dairy cattle.

3.10 **Risk assessments**: on average the FSA completes 15 risk assessments each year to inform risk-based policy making. Between 1/11/23 and16/8/24, we conducted 10, which aligns to the usual expectation. There is also a service level agreement with Defra for an additional 5 risk assessments per financial year, supporting 3rd country import market authorisations. By the end of the FY 23/24 (which falls within the cited period above), we had delivered the 5 risk assessments that were committed to.

3.11 For example, from our risk assessments, advice for pregnant women and other vulnerable consumers on consuming ready-to-eat cold-smoked fish was updated, and it was also recommended that Stilton be removed from the 'safe to eat' list. This allowed the FSA, UKHSA and NHS England to align their advice on risky foods for pregnant women.

3.12 **Market authorisations**: in FY23/24 we achieved the target of publishing 86 safety assessments including ones for novel foods, food and feed additives, and flavourings. This compared to 13 assessments published in FY22/23. While delivering these assessments proved stretching, they provide confidence in our process flow calculations, as we gain more experience with completing the whole risk assessment cycle in different regimes. Completed assessments can be found on our website (footnote 3)and highlights include:

a) The first two novel food safety assessments for cannabidiol (CBD) in April 2024. These are the first safety assessments in the world for CBD in food and demonstrate our regulatory science capability on a challenging product group. As a result, SERD were invited to present our experiences in developing the provisional Average Daily Intake (ADI) at the International Conference on the Science of Botanicals, hosted by the US Food and Drug Administration.

3.13 The first 12 GB safety assessments for Genetically Modified Organism (GMO) applications have also been completed. No safety concerns were identified, and all products were considered as safe as their non-GMO counterpart with respect to potential effects on human and animal health.

3.14 **Risk analysis capability**: SERD have continued to build capability through delivery of our inhouse training programme, focused on risk assessment, toxicology and microbiology. We have also continued our incident competency training, culminating in the annual lessons learned on incidents and outbreaks workshop in February 2024. The FSA Science Council is working on how we might better evidence wider impacts – for example, nutrition and sustainability in our risk analysis.

3.15 Demand for incident and strategic risk assessments is assumed to stay constant, but our process improvements and greater experience in market authorisations are increasing the number of safety assessments we can deliver each year.

3.16 Looking forward, there are several, large complex assessments which are due to conclude in autumn including an assessment of the safety of Titanium Dioxide in food and several import risk assessments considering products of animal origin.

4. Research and Evidence

4.1 **Research & Evidence Programmes (REPs):** since 2019, the FSA has delivered its research and evidence projects through a series of REPs. The process associated with this has evolved over time but serves three key purposes:

a) Development of new ideas and research questions

b) Priority setting and planning of future projects

c) Assurance on prioritisation and project delivery

4.2 In FY24/25, the process was renewed and there are now just four REPs (down from 11); these are considered separately below. For each, there is a REP Delivery Group, consisting of both relevant technical experts and policy customers. The REPs are supported by a small, research programme team and the REP portfolio tool, which provides project and portfolio management information.

4.3 **REP governance & assurance:** the planning, delivery and assurance of the REPs fits into an annual cycle, which is aligned to FSA business planning. This is described in Annex 5. As well as describing the timings and associated inputs and outputs, the overview highlights the various mechanisms which are in place to assure the REPs are delivering appropriate outcomes for the FSA.

4.4 **Areas of Research Interest (ARI):** aligned to the REPs, we produce and publish our ARI, which all government departments are obliged to publish, to encourage collaboration within government and with the external research community. First published in 2017, the FSA's ARI have been refreshed periodically to ensure they match evolving priorities. Following internal consultation, we have recently refreshed our ARI and the current list is listed in Annex 6 which will be published imminently. In future, we will seek to publish refreshed ARI on a 1-2 yearly basis, and we will engage the Board in this process.

Foodborne Disease and AMR Research and Evidence Programme

4.5 Constituting the largest REP by value (forecasted to be £2.7M in FY24/25), this programme is mostly delivered via a small number of large projects/areas, which are ongoing and delivering over multiple years:

4.6 **Antimicrobial resistance (AMR):** as a partner delivering the UK's cross-government AMR National Action Plan (NAP), the FSA's focus is on conducting surveillance to understand the risk of AMR transmission via the food chain. This approach is guided by the 2023 review of the FSA's AMR research programme and progress against the FSA's NAP commitments (a review summary was published in September 2023 (footnote 4)). The priorities identified have been used to inform our ongoing research commissioning, as well as the development of the new NAP 2024-29 (June 2024) (footnote 5), where the FSA leads on food AMR surveillance and research.

4.7 As well as the continuation of the established retail meat surveys to provide ongoing AMR prevalence trend data, the 2023 review recommended a focus on filling knowledge gaps on foods where the risk of spread is higher, for example ones that are ready-to-eat. As a result, we have commissioned surveys on farmed salmon (reporting in 2024) and lettuce (to start this year). A further surveillance project targeting offal-based products (for example, meat pates) is planned. In these cases, in addition to AMR, we are also sampling for non-resistant pathogens linked to recent outbreaks and thus ensuring added value. This includes testing salmon for listeria and lettuce for STEC.

4.8 **Food Safety Research Network (FSRN):** hosted by the Quadram Institute, the FSRN started in 2022, with co-funding from the FSA and BBSRC. Its aim is to 'connect food industry, policymakers and academia to collaboratively pursue shared research priorities that will protect the UK from foodborne hazards.' Based on progress made, in early 2024, BBSRC agreed to support the FSRN for a further year (FY24/25), using ongoing government support for PATH-SAFE as a matched contribution. As a future priority, we will be seeking to sustain the benefits of FSRN into the future. An example is the work the network, along with the FSA, is doing on building a food microbiology data sharing platform with industry.

4.9 **Third study of Infectious Intestinal Disease in the UK (IID3):** this project aims to estimate the burden and causes of IID in the UK population. While the project is ongoing (due to complete in 2027), the data collection phase is fully operational, with an above expected total of 1410 patient samples received (as of 13/8/24).

4.10 IID3 is also being used as a platform for engagement and collaboration across the wider FBD research community. Scientific presentations introducing IID3 to academic audiences have promoted project awareness and encouraged collaboration opportunities. From these, two different projects (University of Cambridge and Quadram Institute) have received approval to sequence stored IID2 samples, increasing the amount of information that can be compared to the IID3 results. Two further projects are being explored with Health Protection Research Unit in Gastrointestinal Infections (HPRU-GI) collaborators to use IID3 samples for complementary projects, increasing the value for money we will get from these samples. Engagement has also yielded a further project being delivered via the PATH-SAFE programme.

4.11 **Pathogen surveillance in agriculture, food and the environment (PATH-SAFE):** this FSA-led, cross-government, Shared Outcomes Fund (SOF) project, is designed to pilot improved approaches to FBD and AMR surveillance across the agri-food environment. Starting in 2021 and initially funded for 3 years, we successfully bid for a 1-year continuation and the project is now due to finish in March 2025 (total extra funding of £4.7M).

4.12 The new project work includes extending the whole genome sequence (WGS) data sharing platform to cover E. coli and listeria. Under the initial pilot phase, this platform focused on salmonella and that system was released in March 2024. With the extended capability, the data platform should help with pathogen incidents by allowing easier sharing and analysis of WGS data between different government departments and making sure we take a One Health approach (with data from human, animal and food sources) to enable better source tracking. We are working to embed this tool for routine usage in 2025 and beyond.

4.13 Working with IID3, a new project will explore the presence of foodborne pathogens in wastewater samples, taken as part of the existing polio surveillance network. This data will be compared to the final IID3 dataset to see if wastewater surveillance might serve as a cheaper, quicker alternative to estimating IID in the UK population.

4.14 A major focus (in-year and future) is delivering projects outputs and dissemination activities. In February, we hosted the PATH-SAFE Biosurveillance Conference with 140 in-person delegates and 65 online. Annex 4 lists publications produced to since the last update, including 18 internal technical reports and four journal papers. External reports will be made available on the programme website and internal report findings will be made publicly available across 2024. Also invited to contribute articles to two microbiology journals (first one to be published this Autumn). Finally, PATH-SAFE was presented at various events in 2024 including the AMR NAP19-24 closing meeting, where it was highlighted as a major success.

4.15 **Kitchen Life 2:** observing commercial and domestic kitchens through motion-sensitive cameras has provided empirical evidence of new behaviours (for example, re-use of tea-towels and cloths), which are now addressed in guidance and risk assessments, and quantified known behaviours and their drivers, providing a ‘reality check’ on whether current interventions are likely to be effective. We are now co-funding a PhD student at the University of Leeds (completing FY25/26) to map the gap between self-reported and observed food safety behaviours. Data from KL2 will be used in the upcoming Campylobacter review, including new insights on behaviours around white meat (such as handwashing and reuse of chopping boards), and our report on food waste behaviours will be useful as we tackle these as part of the Government’s priorities on food security and sustainability.

Chemical, Radiological and Food Hypersensitivity Risks Research and Evidence Programme

4.16 A key focus for the last year has been food allergy, completing two major studies and providing direct evidence to support policy. This has included:

4.17 Understanding outcomes and barriers to allergen information provision for non-prepacked and prepacked for direct sale (PPDS) foods identified the need for improving awareness of small business operators on how to package and label food in line with the legislation. As a result, a toolkit of resources was re-shared through a targeted social media campaign, with the Natasha Allergy Research Foundation signposting this to their community and linking to FSA resources on their website.

4.18 The performance of routinely used allergen testing methods, which underpin allergen risk analysis and labelling, were reviewed. There are analytical methods for most regulated allergens (to quantify the amount of allergenic protein), although some have significant limitations. These include issues around cross-reactivity of testing kits, applicability to matrices and target proteins, suitability to processed foods and variability between test kits for the same allergen. The FSA review of allergen testing methods concluded that the following allergens - milk, egg, peanut, tree nuts (almond, hazelnut, walnut, pecan, unprocessed cashew and pistachio), fish (only cod) and crustacea can be tested for at ED05 in certain food matrixes. More work needs to be done to review testing methods for soya, sesame, molluscs and lupins. The review did not look at what can be tested at lower ED thresholds such as at ED01. This work was shared with the Codex Committee on Methods and Sampling Working Group and has been used to inform the Food Hypersensitivity Board paper (footnote 6).

4.19 The NHS allergy data (footnote 7) project was completed. This study described the incidence of severe, life-threatening reactions to food between 2008 and 2018 and established a prospective UK anaphylaxis registry to be used by healthcare professionals.

4.20 The Patterns and Prevalence of Food Allergy (PAFA) project (footnote 8) has investigated the prevalence of food allergy in the UK adult population through a community survey. The study estimated that around 6% (up to 2.4 million) of adults have a food allergy in the UK. The research also found that many individuals have allergies to fresh fruits. These are associated with allergies to birch pollen, also known as pollen-food allergy syndrome.

Market Authorisations (Regulated Products) Research and Evidence Programme

4.21 This programme is a small, reactive programme providing evidence tailored to emerging high-profile policy needs to assist the FSA's developing Market Authorisations Service and support the safety assessment of innovative food and feed products. Projects have been focused on delivering outcomes around three themes:

a) understanding the state-of-the-art detection methods for specific products.

b) understanding public perceptions on emerging technologies used for producing food and feed.

c) developing the evidence base to underpin timely assessments of new groups of products.

4.22 To date, the programme's projects have supported policy development on Precision Bred Organisms, analytical evidence for the enforcement of cannabidiol regulations and expert input on the bioinformatic analysis of Genetically Modified Organisms. Future projects will support emerging regulatory areas including cell-cultivated proteins. In parallel, we provide economic evidence on the costs and benefits of changes to the FSA's Market Authorisations Service.

Regulating The Changing Food System Research and Evidence Programme

4.23 This broad programme supports a range of food system questions, informing the delivery of FSA priorities, the consumer interest, business compliance and healthy/sustainable food.

4.24 **FSA priorities:** evidence to support policy and operational decisions; for example:

a) Our futures work allows for FSA business planning to be grounded in foresight; we share knowledge across Government and with international regulators. Our biennial assessment identified an evidence gap on the impact of AI on the food system; an evidence review will be published this year.

b) Analysis of local authority (LA) capability and capacity has helped FSA, LAs and stakeholders to co-ordinate responses to shared issues, bringing workforce challenges to the top of the agenda and prompting work in the environmental health sector to boost the pipeline of officers. Evaluating the pilot model for food standards Official Control delivery informed the decision to roll out and identified potential changes to the Codes of Practice around the use of intelligence, targeted remote interventions, and the identification of non-compliances linked to allergens, which have since been tested as part of the pilot in Wales.

c) Analysis of animal welfare standards at slaughterhouses in England and Wales, including CCTV data is being used by Defra and Welsh Government to feed into their respective reviews of slaughterhouse CCTV legislations. FSA analysis of OV activities is being used by Defra and Welsh Government to support funding and policy review on animal welfare, as well as to support solutions to the labour shortage of vets.

4.25 **Consumer interest:** supporting FSA's responsibility to protect the interest of consumers in a changing food system. For example:

a) Tracking changes in public attitudes, knowledge, and behaviours through our two consumer surveys: Food & You 2 (footnote 9) and the Consumer Insights Tracker (footnote 10) (joining up with FSS on the former for the first time since 2014).

b) Food & You 2 data supported risk assessment (for example, for Salmonella in UK-produced eggs) and risk management (for example, to inform consumer advice on CBD). Data was included in the Annual Food Standards Report and Defra's UK Food Security Report and the FSA response to the House of Lords Food, Diet and Obesity Committee inquiry.

c) Tracker data was supplied and used in resulting communications activity on ultra-processed foods, risky behaviours due to household food insecurity, and analysis of changes in trust in the FSA. DWP use this data in their evaluation of cost-of-living payments, and in a dashboard for No.10 and Cabinet Office to inform policy on poverty.

d) Exploring consumer views on regulatory divergence from the EU and within the UK when it comes to food has informed the impact assessment of proposed reforms (footnote 11) to, for example, market authorisations.

e) Upcoming projects will investigate what builds and maintains consumer trust in the food system and its regulation following a dip in trust observed in Food and You 2 earlier this year. In addition, the ACSS are helping us develop an impact analysis tool to quantify the economic and societal impact of varying levels of investment in food safety regulation, including on productivity, trade, cost of illness and wider societal impacts.

4.26 **Healthy sustainable food:** For example:

a) We are working alongside Defra, with UKRI, Nesta and academic partners, on SALIENT, a three-year programme of behavioural trials in retail, catering and community support settings, modelling the long-term health, equity, health care cost and environmental impacts at population level. SALIENT ran seven trials this year (results to be published in this year and next) and are developing three more.

b) Working with Department for Education, we evaluated the first phase of the School Food Pilot, which found that it could be feasible to inspect nutrition as well as safety standards through local authorities (footnote 12).

c) The Consumer Tracker identified a high level of consumer concern about ultra-processed food. We are now working with UKRI/BBSRC to develop a potential Public Dialogue to understand this concern in more depth.

5. Science Infrastructure

5.1 In addition to our research programmes, we work to ensure we have the right underpinning scientific infrastructure (including skills, testing capabilities, research tools, governance and assurance mechanisms) to enable the ongoing delivery of the FSA's science and address its evidence needs, and ensure that we can do so effectively and efficiently in the future. Areas covered in this section include:

Building and sustaining science capabilities

5.2 **Laboratories:** to sustain the capacity and capability of Public Analyst (PA) Official Laboratories (OLs), the FSA has been delivering Phase 2 of the future laboratory plan (approved by the Board in 2022). In year, this has included:

a) Capital grants programme worth £500K, which has allowed four PA OLs to invest in equipment to extend their testing capability and capacity. The analytical areas targeted were metals analysis in food and feed, DNA testing (including GMO, meat speciation and allergens), food additives and alcohol adulteration.

b) Targeted capability grant programme, providing £360K funding to develop OL capability and capacity including pesticide testing, veterinary medicine residue testing and authenticity. The results of the FY23/24 sampling campaigns were used as evidence to target this investment.

c) National Reference Laboratories (NRLs) have begun work to develop subsidised testing for PA OLs in difficult and novel areas. Along with the Defra's framework for Authenticity Centres of Excellence, this will support testing in the event of a major food or feed incident. We have also expanded the NRL contracts to provide additional support in the event of an incident.

5.3 Looking forward, we are seeking to work with other departments to build national capabilities into a Biosecurity Theme spending review submission.

5.4 **Sampling:** in FY23/24, the FSA spent £3.35M on sampling. This was split between regulatory monitoring (to fulfil our statutory responsibilities), sampling to inform science and research (for example, filling knowledge gaps to inform risk assessment), targeted surveillance sampling (specific commodities to validate intelligence on specific risks), official control sampling (allowing LAs to take targeted samples to support enforcement). Almost 14,000 samples were taken, of which around 1,000 were non-compliant. This is broadly consistent with previous years. Highlights were:

a) The 2023 annual radiological monitoring programme showed radioactivity doses from food from UK nuclear sites were well below legal limits.

b) FSA-funded sampling results were critical to developing the risk assessment for the Lough Neagh algal bloom incident.

c) Sampling of imported snack foods and bakery items and prepacked for direct sale bakery items was undertaken to generate more data on the allergen risk associated with these products (for example, undeclared allergens), as initially identified by surveillance sampling. These results have facilitated business advice and lead to LA investigations into breaches of legislation.

5.5 **New methods:** the FSA has an annual programme for developing new methods of analysis, with an aim to address gaps in laboratory testing capability. This programme is designed to provide new methods, which can be transferred to OLs. Recent examples include:

a) Allergen testing: based on a review of testing methods for the 14 regulated allergens, commissioned in 2022, PCR-based testing was recommended. Using this and information on cross-reactivity gathered from our surveillance sampling, we invested in multi-allergen PCR-based testing capability within our OLs and thus improve access to reliable food allergen testing for the FSA and LAs.

b) Herb and spice testing: routinely sampled as part the annual Retail Sampling Survey, current microscopy testing methods are labour intensive and R&D was commissioned in FY23/24 to look at potential alternatives. This led to the validation of Next Generation Sequencing for this purpose and prompted the adoption of new Fourier Transform Infrared methods (the latter funded under the FSA's grants programme).

5.6 **Skills**: it is recognised that there is a shortage of regulatory toxicologists in the UK and the FSA has been working in partnership to address this. As a founder of the British Toxicological Society Skills Gap Programme, we were delighted to see the first regulatory toxicology training modules being launched in June 2024. With beyond predicted numbers of participants signed-up (over 150), it verifies the demand for such training and gives a strong indication that this component will be sustainable going forward.

Assuring our science & performance

5.7 **Science Advisory Committees (SACs):** details about the work of the SACs were presented in the CSA's Board report and recommendations were made. (the response to those is presented in Annex 1). Alongside addressing these, another in-year focus was to improve the efficiencies of the SACs; enabling them to deliver a larger workload and improved value for money. As an example, SACs are increasing the number of meetings that are held online (for example, around 70% of meetings are now held virtually, rather than in person).

5.8 **Cross-government science initiatives:** we continue to engage with and deliver across all relevant cross-government initiatives, as an active member of the CSA, deputy CSA and CSA officials' networks. An example is the work done to better collate and analyse the FSA's research data This work recently received a commendation from The Government Chief Statistician and other departments now want to follow our approach, for example, adopting the portfolio tool developed by FSA.

5.9 **Science Quality Assurance Hub:** as part of continuous improvement work on science quality, all the science and analysis QA resources from across the FSA and wider government (for example, analytical professions) have been collated into a single resource, available on the intranet. This supports the training of new staff and sharing of best practice across science disciplines, improving both quality and efficiency.

Delivering impact, communications & engagement

5.10 **FSA Science Newsletter:** started in 2022 to engage with external science stakeholders, this quarterly newsletter now has over 3000 subscribers.

5.11 **Publications**: there has been an increase in the number of FSA science publications, with more being published in the in the 6 months covered here than in the entire 12 months covered by the last update (details in Annex 4).

5.12 **New publication platform:** to ensure our science is available, accessible and delivers the most impact, SERD have implemented a new publication solution with a dedicated website. In addition to making FSA science easier to find, it will enable us to track the use of our research

more effectively. This new platform is currently undergoing beta testing and will be launched shortly.

6. Future planning: strategic development

6.1 Looking beyond FY24/25, we are developing a longer-term strategic view of science needs, accepting that future business priorities will be determined later in the year, based on the policy direction set by the new government and steers from the FSA Board. This also recognises where the FSA needs to lead, focusing finite resources on areas where others will not deliver, and where we can leverage resources from other sources (for example, external funding pots). As part of this longer-term view, we are developing ideas for delivery beyond next year, across the wider SR period. These include:

6.2 **Enhanced food system surveillance**: we will seek to build an integrated food surveillance programme. To achieve this, we will:

a) Build on current FSA programmes (future laboratories, PATH-SAFE, digital surveillance), taking approaches piloted and tools developed, and integrating them into our business-as-usual surveillance work (for example, the PATH-SAFE sequence data sharing platform).

b) Continue to invest in our national laboratory capability, delivered via NRLs, OLs and other Public-sector Research Establishments (PSREs).

c) Work across government to ensure alignment to the Biological Security Strategy (BSS), ensuring that food is recognised as part of a One Health approach.

d) Progress a food surveillance bid within the Spending Review Biosecurity Theme (being led by Cabinet Office).

6.3 **Tools for better regulation:** focusing on the skills and tools needed to deliver a better market authorisation service. This includes:

a) Continue investing in novel approach methods (NAMs) which can replace traditional toxicological methods (for example, using animal models) and potentially accelerate risk assessment.

b) Invest in regulatory science skills (for example, toxicology, bioinformatics) to ensure we can generate the required safety data to assess new products in a timely and proportionate manner.

c) Work with the relevant UKRI-funded research and innovation networks (for example, National Alternative Protein Innovation Centre) to gain access to knowledge (for example, technology foresight) and research (for example, new safety assessment methods) and allow for the education of SMEs.

6.4 **Social science:** as part of an ongoing review of our analysis function, we conducted a rapid assessment of our social science portfolio and are now implementing the following recommendations:

a) In line with Board steer, focus on risk analysis and our core reform priorities, maintain and mine our evidence base on what consumers value and invest no further in healthier and/or sustainable food (unless additional SR funding becomes available).

b) Manage our portfolio towards an approximate 25:75 split of proactive to reactive work through the REPs; answering new questions and seeking opportunities to use statistical analysis, theory and evidence review more systematically in-house.

c) Change the frequency of Food & You 2 to once (not twice) a year, using the savings to address questions about other actors in the food system.

6.5 **Science engagement & education**: there is an important role for science in building trust in food and the work of the FSA. It can also be a vehicle for engaging with people, as consumers but also as potential research collaborators and future talent. It can be used to facilitate our role as a convenor. However, while we do conduct science outreach and engagement activities, the FSA lacks a co-ordinated approach to this area. In the future, we seek to:

a) Create a joined-up science engagement programme, which draws together all such activities into a targeted plan, which aligns to strategic goals.

b) Engage with higher education students, through presenting on the work of the FSA/government science and offering potential work placements, building as part of established professional and other careers development for FSA staff.

c) Encourage FSA scientists to deliver external engagement activities as part of their ongoing CPD and personal development.

d) Develop a planned and prioritised series of events to engage with targeted audiences, for example, specific research communities, OGDs, international partners.

e) Resources permitting, consider expanding the number of research fellowships, studentships and paid internships the FSA offers, to give us access to new skills and create better exposure to our work.

f) Use our engagement programme to support diversity and inclusion, including supporting better social mobility within science.

g) Work with cross government initiatives, such as those being led by the Government Office for Science, to encourage more scientists to join the civil service and improve career pathways once they are civil servants.

7. Conclusions

7.1 Working on the assumption that public sector funding will be more restricted in the future SR period, SERD needs a balanced approach to ensure we continue to deliver the science and evidence that the FSA requires. This includes delivering the shorter-term, policy-driven needs of the FSA (for example, our delivery of risk assessment, as an integral component of the RAP) but also continuing to invest in longer-term science capabilities (for example, new surveillance and analysis methods, skills and strategic research).

7.2 We will need to maximise our strategic partnerships (for example, with UKRI and the government biosecurity community) to influence future research programmes and leverage external science funding.

7.3 We will also consider the government landscape post-election and be agile to any changing policy positions and to ensure alignment to the government's missions. We will need to rapidly review and prioritise our science (including our skills, capabilities, research & evidence programmes) to meet those needs.

Annex 1 - Response to the recommendations in the CSA's Annual Report

The annual Science Update from the FSA's Chief Scientific Adviser (CSA) was presented to the June meeting of the FSA Board (footnote 13). In that report, a series of recommendations were made and the initial response to each of these is given below.

Scientific Advisory Committees and Science Council

- Recommendation 1– FSA should investigate technical/operational enhancements that may streamline SAC working. These range from relatively simple approaches (such as 'clustering' similar applications together, so that they can be considered in one session) to more 'future-facing' enhancements (such as using artificial intelligence approaches to triage applications, summarise dossiers and highlight similar authorisations in other jurisdictions)

We have initiated work to look at improving efficiencies in SAC working, including the batching of similar pre-market approval dossiers (for example with the safety assessments for CBD) and also reducing the workload of the committees, with several categories of applications that are routine and do not pose any novel, complex toxicological or significant scientific challenges, being completed in house.

We are working on developing an extension to our current case management system for premarket approval applications that will incorporate aspects of the offline processes for managing cases through the risk analysis process. This is designed to centralise the information, provide clearer management information of the end-to-end processing of an application and to help manage resource and time more effectively. We are also investigating the use of AI into the market authorisation process (see response to recommendation 19).

- Recommendation 2 – Our work to make better use of other regulators' opinions in our own risk assessment process is continued and expanded. In particular, I note that there may be opportunities in the future to consider more formal collaborations with other international regulators – for instance, in formally considering applications together, or exchanging expertise in complex, innovative areas such as cell-cultivated proteins.

Since the June FSA Board, we have expanded our use of other regulators opinions (OROs) into additional market authorisation regimes and covering a greater variety of application types. We will continue to triage incoming applications for suitability to use OROs, increasing the number of applications using this assurance route this financial year, ensuring our safety assessments are proportionate. We want to share our experiences, experts and knowledge and we are looking to strengthen our current international engagement with relevant working groups such as Codex, FAO and WHO. We are also exploring more frequent regulator-to-regulator exchanges on *ad hoc* risk issues and more formal relationships, for example, joint memorandums of understanding.

- Recommendation 3 – That 'interests' [of SAC members] be clearly defined to include non-commercial arrangements (such as major research interests for those with active research portfolios), memberships of advocacy groups and other potential interests that are not financial in nature.

- Recommendation 4 – That the declarations of [SAC] member interests be collated in one area on the FSA website to ensure maximum visibility

We will implement these recommendations as part of a standardisation and refresh of the SAC websites, and when we collect the interests of new members and undertake the annual review.

- Recommendation 5 – That the ‘default’ for SACs is to hold at least one ‘open’ meeting each year, which stakeholders and members of the public can attend. I note that this will necessitate careful planning in order to retain the confidentiality of commercially sensitive papers for some SACs and therefore arrangements will need to be individualised for each SAC.

We are investigating the feasibility of recommendation 5 and the associated costs, implementing it where possible, and report on progress and implications next year.

- Recommendation 6 – That an ‘audit’ of a random selection of SAC members (and other independent advisors, such as the CSA) be carried out by the FSA on an annual basis. This could examine areas such as research funding, publications, paid-for speaking engagements, social media contributions, consultancy work and so forth.

- Recommendation 7 - We ensure our policy on conflicts of interest (CoI) is very clear in any future SAC recruitment campaigns, including that we welcome applications from all sectors of science but that an open and transparent declaration of interests is a fundamental principle underpinning all SAC activities.

- Recommendation 8 – We formalise a system for assessing and acting on CoI in the unlikely event of a dispute with a SAC member.

We are working to implement a range of actions to further strengthen process and assurance around CoI with SAC members and other advisors. This includes considering how to conduct the annual audit of interests (recommendation 6). We will work with the CSA, SAC chairs and other FSA teams (with relevant expertise) to develop this with the expectation that the CSA will be able to report on progress in his next report.to the Board.

In addition, we reviewed and updated the CoI guidance for the latest SAC recruitment process that began in August 2024. Applicants have been made aware that if appointed to a SAC, they will have to provide information about their personal interests (for example, direct employment, consultancies and other fee-paid work, shareholdings, clubs and other organisations); and non-personal interests (for example, fellowships, indirect support, trusteeships, land and property, other public appointments). We will also review the guidance about what level of detail is required related to funding sources for any grants, where members are direct and indirect recipients.

All SAC members are asked to review their CoI on an annual basis. It is also best practice for members to update the SAC Secretariat as soon as possible where a new CoI may occur, rather than wait for the annual update. In addition, at every SAC meeting, committee members are also required to declare any personal or business interests in matters under discussion and this may lead to the member refraining from engaging in the discussion and determination of the issue. When there is ambiguity over a potential conflict, the decision rests with the Chair in consultation with the Secretariat and CSA or directly with the CSA when the conflict concerns a Chair.

To support consistent CoI processes across all SACs, specific CoI guidance will be detailed in the SAC Ways of Working document (to be finalised December 2024).

- Recommendation 9 – We expand on our recent efforts to maximise diversity on SACs, for example through the recruitment of ‘associate’ SAC members, since diversity of opinion is

an additional precaution against inadvertent bias

The review of the pilot of the associate members confirmed it was a success and have continued with it, with improvements following feedback, for the current recruitment campaign. We will also seek ways to further engage with experts in Wales and NI, following feedback from both the Welsh and Northern Irish Board members, in response to the CSA's paper.

- Recommendation 10 – Senior colleagues across the organisation, and not only within SERD, engage closely with the Science Council to design similar activities [to the "Wider Impacts project"] that the Council might usefully contribute, particularly in areas such as regulatory reform, innovative technology, or international joint working.

To support selection of Science Council's next piece of work, the FSA Executive Management Team including the FSA Chair were asked to select questions from the final list of 50 produced at the Science Council led "Key research questions for the future of food safety workshop" that are of most relevance to the FSA. They identified 11 which were then considered by Science Council who have prioritised those which they are best positioned to address, and this list has been shared with the CSA for further consideration.

To further SC engagement, we are linking specific SC members to specific Research and Evidence Programmes and thus get their input into the FSA's top-to-bottom approach to developing and prioritising research ideas (See Annex 5).

Official Laboratories and Sampling

- Recommendation 11 – FSA undertake a review (perhaps led by Science Council) of the existing UK capability to deliver official testing in line with (inter)national reference requirements and identify priorities for future investment and/or formal international partnering agreements

The FSA continues to review the UK's official control laboratory testing capability. Building on a major review conducted in 2019, we have continued to conduct independent reviews, including the Government Chemist survey and the NRL microbiology laboratories review. In addition, through our own future laboratories programme, we engage with OLs and NRLs directly to understand gaps in national testing capability, which in turn are addressed via our method development and grants programmes (see section 5.2).

As described in section 6.2 of this paper, there is also ongoing work to align the food surveillance work of the FSA with the wider cross-government Biological Surveillance Strategy (BSS) and initiatives that sit underneath it (for example, National Biosurveillance Network). This is designed to ensure that food surveillance is properly represented within the BSS and to seek access to future resources to support this (for example, via a future biosecurity theme under the next SR).

- Recommendation 12 – SERD colleagues continue to engage closely with learned societies, UKRI and other interested parties to create enhanced provision of specialist training via both 'classical academic' (degree, MSc, PhD) and alternative (online, modular, part-time, etc) training mechanisms.

- Recommendation 13 – FSA work closely with other regulators and government departments to make the strongest possible case to Treasury at the next Spending Review

for increased investment in specialist STEM training, especially in areas of regulatory science.

In terms of skills and training, the FSA is actively engaged in a number of activities. This includes funding fellowships and PhD studentships in relevant disciplines (for example, computational toxicology, microbiology). For the latter, this is often through our support of UKRI Doctoral Training Partnerships (DTPs) including the Norwich Research Park and London Interdisciplinary Biosciences ones. We are also working across government, industry and academia to support the British Toxicological Society's regulatory toxicology Skills Gap programme and we have highlighted this in Section 5.6 in the body of this paper.

- Recommendation 14 – FSA capitalises on international collaboration in this area [of scientific capacity building], both through formal project collaborations and via the provision of secondments/staff exchanges with other national regulators in countries with comparable food standards.

We are actively seeking international opportunities to develop our capabilities and co-operate with other food regulators.

We Chair and Vice-Chair the international food regulators' groups for economics and social science respectively, publishing joint papers on shared questions, including the measurement of trust in regulation, risk perceptions of emerging technology, and the application of social science to risk assessment. We also work closely with international peers to share knowledge on foresight and horizon scanning.

We engage with international regulators (for example, Singapore, Canada, USA, Germany) through international visits and bi-lateral discussions. We also participate in technical working groups (for example, the FAO cellular agriculture group). We represent the UK on the Codex Committee on Methods of Analysis and Sampling, playing a role in defining international procedures, protocols, guidelines. This includes co-chairing a working group on precautionary allergen labelling with the USA (CCMAS44).

As well as continuing to develop these existing links and activities, we are also seeking new opportunities. For example, aAs the UK rejoins the EU's Horizon programme, we are exploring the additional research opportunities presented through this and feeding into governmental consultations on future research calls.

PATH-SAFE

- Recommendation 15 – Each individual project within the programme is carefully appraised in terms of a) output and b) value for money and then a decision taken about whether (aspects of) work within the project should be continued and, if so, which department will formally 'own' that activity going forwards. Without this, there is some risk that beneficial strands of work will fall between two stools.

Following on from the programme-wide discussions on outputs and legacy started at the PATH-SAFE conference in February 2024, the programme is arranging a series of workshops over Q2 / Q3 which will seek to appraise project progress, consider and agree next steps for the work, and agree ownership of areas of work moving forwards. The workshops will seek to bring together relevant stakeholders (such as technical, policy and legal representatives) from FSA, FSS, UKHSA, Defra, VMD, EA, APHA, Cefas and others, with information collated through PATH-SAFE reporting processes, including information on outputs, outcomes, spend profiles and lessons learnt, underpinning discussions. Areas of focus currently identified include wastewater-

based epidemiology, AMR environmental surveillance, new biosurveillance knowledge and approaches, on-site diagnostics and the genomic data platform. The outputs from the workshops will be fed into the programme evaluation to evidence how PATH-SAFE is working to disseminate information on and embed its outputs and is thereby working to ensure maximum benefit is achieved from the work.

- Recommendation 16 – All partners in the [PATH-SAFE] programme take every opportunity to identify data streams that could usefully be integrated into the PATH-SAFE 'data system', thereby maximising the impact of that system on public health. It will also be important to make that data system available to the wider research community (whilst continuing to ensure the confidentiality of sensitive data within it) over the coming months, so that independent research groups can critique and extend on the work.

Alongside work to continue to technically develop the genomic data platform, concerted efforts are being made to enable data flow into the platform from relevant government partner organisations. Data sources have been identified however a number of issues related to sharing of that data have been identified as barriers to enabling the system to function as a tool that aims to support cross-government collaboration, accelerate the identification of foodborne pathogens (and associated AMR) and enable faster intervention to reduce incidence and impact of foodborne illness. Focussed efforts will be made by the programme team and project delivery team in the coming months, including a workshop in August, to work with those government partner organisations to find solutions to the issues identified, to support their adoption of the platform. The programme will seek to utilise its Delivery and Strategic Board, wider programme stakeholder network and the connected networks of colleagues in FSA and beyond to support this. Due to sensitivities in the data held within the genomic data platform, access cannot be freely granted. To enable end users outside of government partner organisations to view the platform and test its capabilities, a demonstration system is being developed. This version can be made available to those independent of the work to test and share feedback.

- Recommendation 17 – FSA/PATH-SAFE colleagues engage closely with those discussions over the coming months and to emphasise at every opportunity the huge benefits to be gained from rapid and effective sharing of information, particularly in the context of infectious disease incidents.

Integration of relevant data to the genomic data platform and adoption of the platform will require the issues / barriers that have been identified by government partner organisations to be resolved. The programme team are spearheading efforts to make progress and welcome the support of Chief Scientific Advisors and senior stakeholders from FSA and PATH-SAFE stakeholder organisations in any relevant discussions they may be involved in and in any specific ways in which we may seek their involvement.

Future Challenges and Opportunities

Artificial intelligence (AI)

- Recommendation 18 – Generally, that FSA remains closely involved with other government departments and other international regulatory bodies in assessing developments in this sector [of data sharing mechanisms] and how they may be best exploited for improved food safety.

- Recommendation 19 – More specifically, that FSA considers how existing AI approaches might be employed for regulatory benefit, for instance in a) risk assessment or b) in using image- or audio-based AI approaches to enhance data-gathering and regulation of busy, complex food environments such as abattoirs or catering establishments.

We will be publishing an evidence review on the impact of AI on the food system and its regulation. This review found that the academic literature is lacking in up-to-date knowledge and that much is commercially sensitive. We have experience in operational use of a range of AI approaches in border surveillance and are exploring its use in meat plant operating situations where the working environment is particularly challenging. We work closely with colleagues from the Government's Central Digital and Data Office (CDDO) for advice on topics such as technical solutions and ethics.

Within SERD/ODD we have also launched a task and finish group looking at large language models (LLM) and how we may usefully incorporate them into our market authorisation processes and are working with our computational Fellow and LiDO PhD student on using AI and other computational tools within our chemical risk assessments. Upcoming work on New Approach Methodologies (NAMs) will include a COT paper on AI in risk assessment, likely to be followed by a 2025 workshop on the same topic. The recent NAMs literature review made recommendations which will be reviewed by COT and inform next steps. Presentations and collaborations internationally, including case studies, will continue with a view to harmonising NAMs for use in the regulatory space for example, through continued attendance at APCRA (Advancing the Pace of Chemical Risk Assessment) and PARC (Partnership for the Assessment of Risks from Chemicals) and also continuing to Chair the Cross-Whitehall strategic steering group on NAMs established by the FSA in 2022 (New Approaches to Chemical Risk Assessment in the Regulatory Space (NACRARS)) meetings.

<u>Ultra processed foods (UPF)</u>

- Recommendation 20 – That FSA engage closely with other departments and funders in pursuing key areas of research on UPFs that are recognised as currently lacking, such as randomised controlled trials and detailed population level consumption/health data, or 'mechanistic' studies to determine the potential biological effects of UPFs or their components on health.

- Recommendation 21 – That FSA colleagues collaborate with other international regulators to consider how complex, multi-component interactions between ingredients (such as additives, emulsifiers and colours) may be best considered within risk assessment approaches.

- Recommendation 22 – That FSA engage with industry and other stakeholders to consider how long-term product impacts (both good and bad) on consumers might best be analysed, for example, via post-authorisation market monitoring approaches or similar.

We have been tracking consumer concern around UPFs on a monthly basis since last year. It consistently tracks in the top three concerns for consumers, alongside food prices and food poverty. We are working with UKRI/BBSRC on their potential Public Dialogue to understand consumer understanding and concern around UPFs in more depth.

Tools and approaches needed to assess the impact of aggregated and cumulative (multi-component) exposures to chemicals are not fully developed at the current time and represent an opportunity to collaborate both cross government and internationally.

We are actively seeking national and international collaboration on the complex underlying issues associated with chemical exposures in food. As part of the UK National Hub and Steering Group within the Partnership for the Assessment of Risks from Chemicals project (PARC) we engage with other international regulators with an aim to develop next-generation chemical risk assessment to protect human health and the environment and explore better ways to risk assess chemical mixtures. We advocate calls for research ideas within our Areas of Research Interest.

In our next steps, we will be working with the CSA, UK funders and international partners to further understand research commitments in this area for FY25/26 and how we can collaborate to add value to such projects.

Microbiome modification

- Recommendation 23 – Consider developing a joint working group to examine how best to assess, authorise and regulate food products that are intended to have specific effects on the microbiome of healthy consumers (such as on physical fitness or mental health).

The interaction between the microbiome and xenobiotics in food and feed and its implications for risk assessment has been of long-standing interest. The topic was reviewed by the FSA Committee on Toxicity (COT) and published in 2020. The next workshop – titled “Gut reactions: xenobiotics and the microbiome” is scheduled for October 2024.

Alternative proteins and cell-cultivated products

- Recommendation 24 – Continues to focus attention on this sector and to consider carefully how best to regulate highly innovative cell-cultivated products, particularly those that are far-removed from any existing food types (such as cell-cultivated products produced from extinct species, or multi-species ‘hybrids’).

We are continuing to build FSA science capability in the area of Cell Cultivated Proteins (CCPs), which started from a hazard identification based on the literature, published in 2022 (footnote 14) and the ongoing development of plans to address the scientific challenges these applications pose. This includes how we assess the safety of these novel foods along with guidance and premarket support for applicants.

A subgroup of the ACNFP is in development to bring in the relevant independent experts in the field to ensure we keep pace with technical innovation in this complex and fast-moving area. We are also working with other research funders to ensure that the regulatory science aspects of these novel foods are included within funding calls and other initiatives. For example, we were proactive with the BBSRC-led alternative protein innovation and knowledge centre call and will be key partners in the recently announced, successful bid: the National Alternative Protein Innovation Centre. Also, ongoing partnering with Innovate UK on knowledge exchange related to SMEs developing alternative proteins.

To support this work the FSA is tendering for two exploratory research projects to consider specific aspects of the production of CCPs and the risks they may pose. We are also engaging with partners internationally, through the FAO Technical Working Group, to explore opportunities to learn from other regulators’ knowledge and experience in this area.

Annex 2 - Business Analysis, Finance & Performance Data

Science in the FSA is divided into 3 core areas:

- Risk analysis
- Research & Evidence
- Science infrastructure

We deliver our science through a combination of internal expertise and the coordination of external spend. The current distribution of FTE across each function within SERD is shown in Figure 1

The science budget is split between investment in staff and 3rd party spend and the trend over the last few tears can be seen in Figure 2

The distribution of our spend in FY23/24 is shown in Figure 3 (noting this is mapped against our previous research programmes) and our forecast spend against our new research programmes is shown in Figure 4.

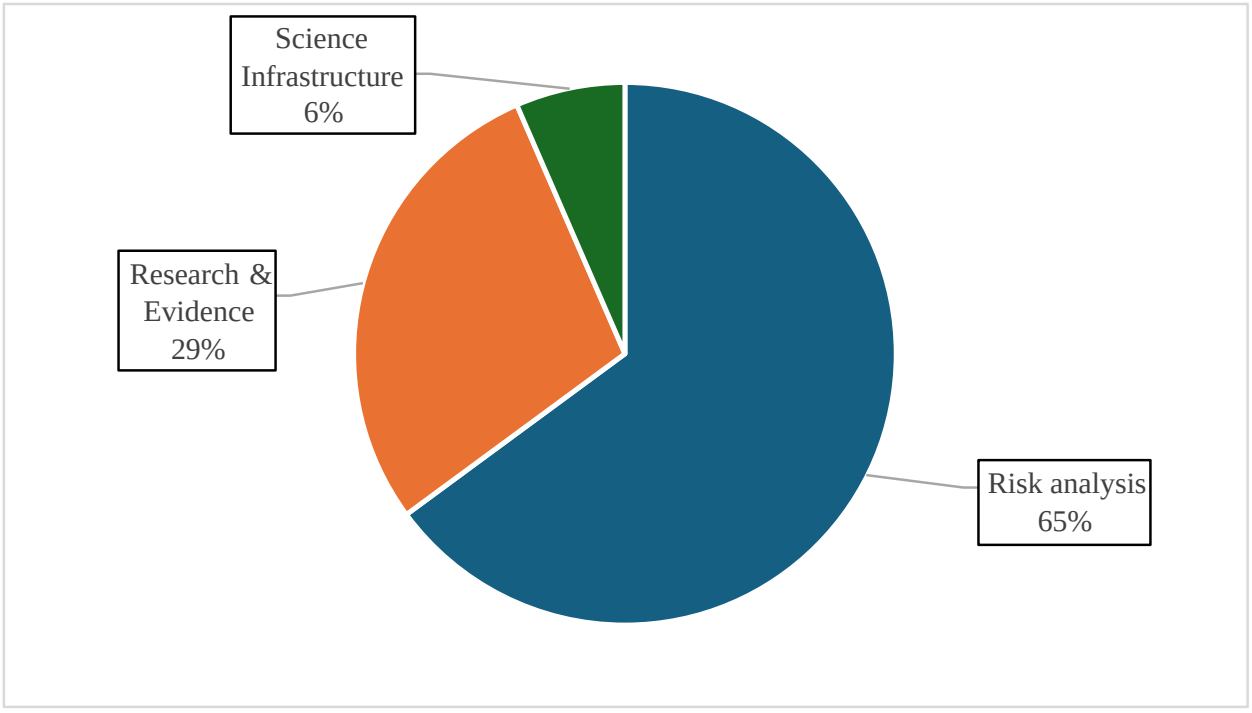

Figure 1 distribution of staff effort

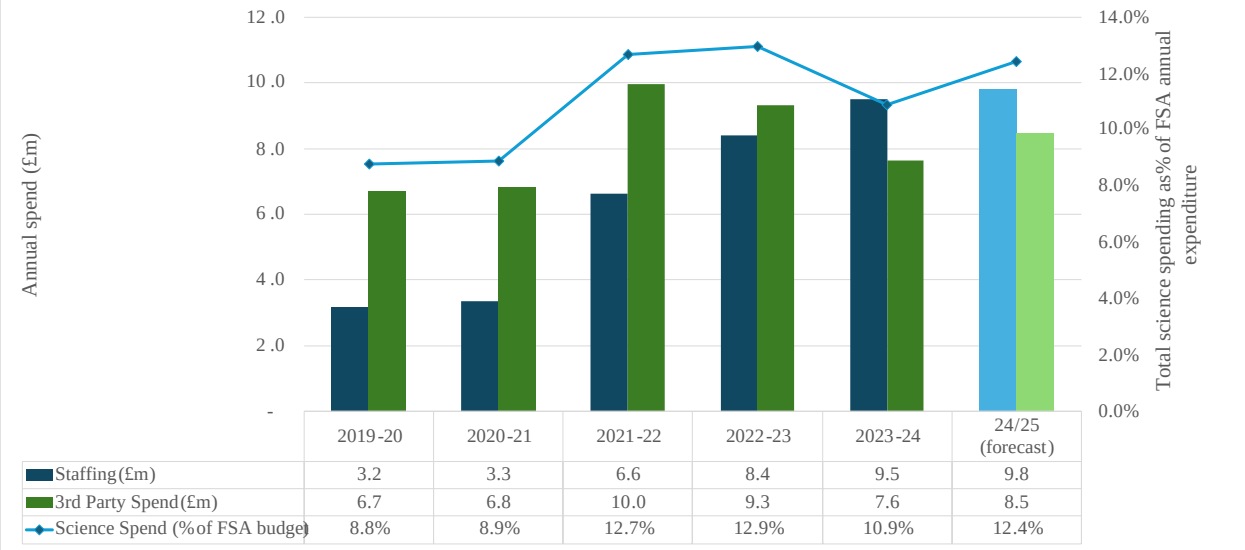

Figure 2 distribution of spend over time

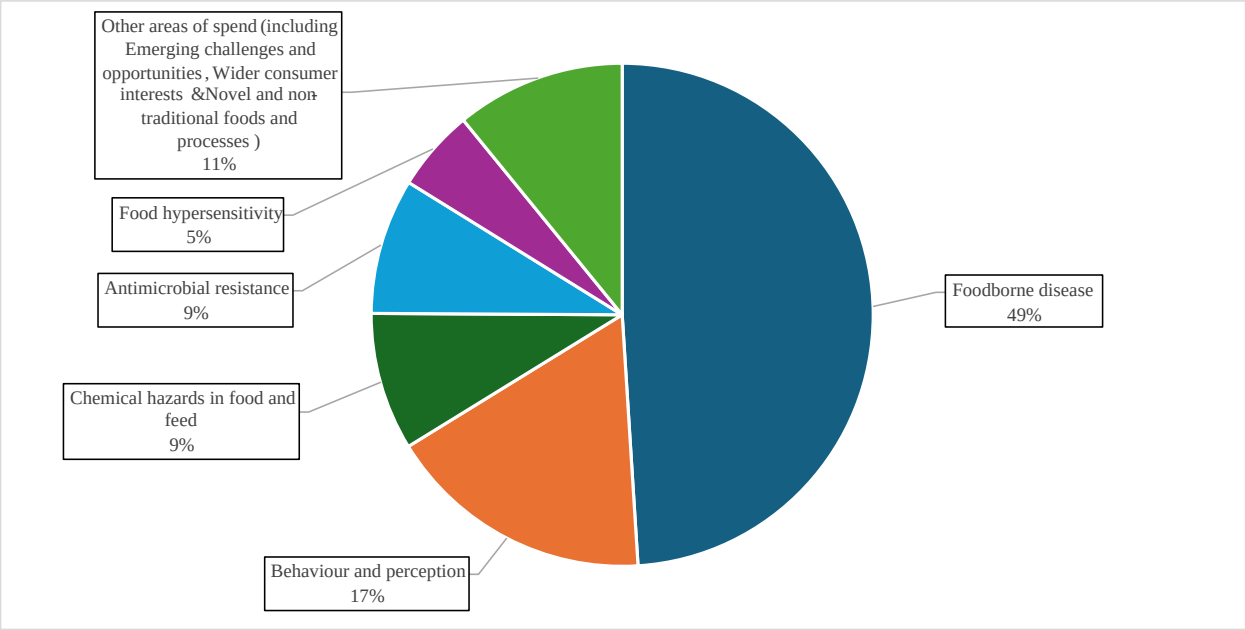

Figure 3 distribution of spend in FY23/24

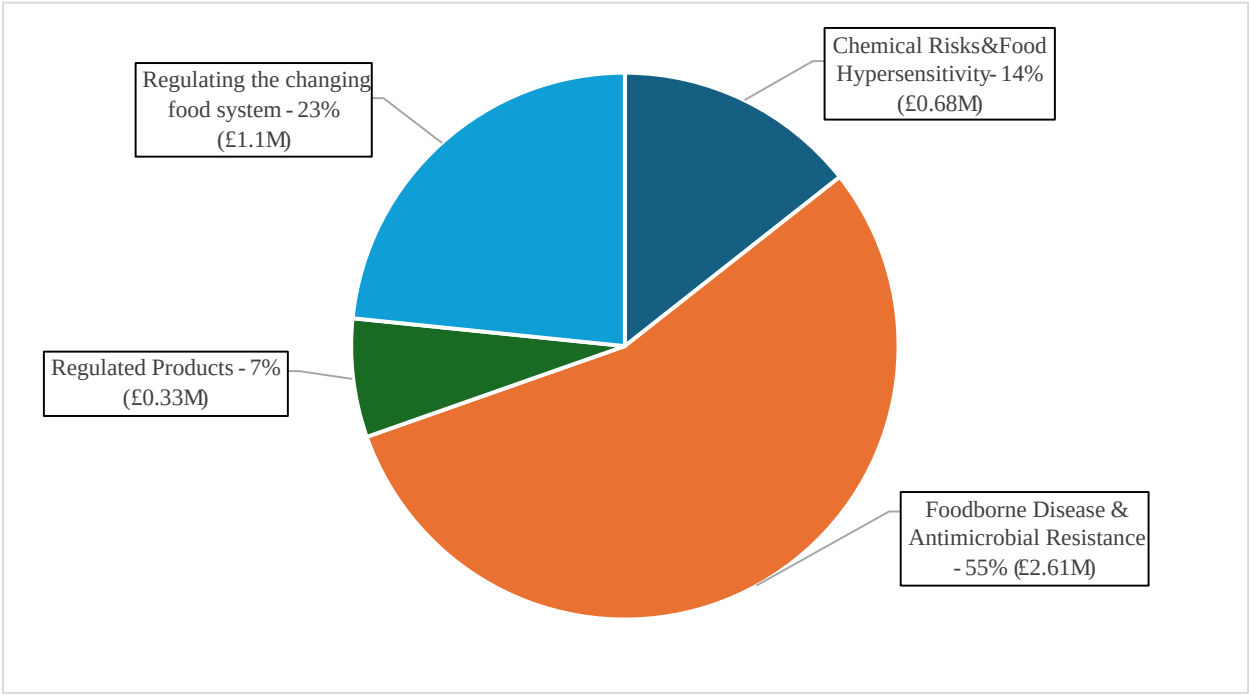

Figure 4 Forecast external spend in FY24/25. N.B £2m of the foodborne disease and antimicrobial resistance spend is on the IID3 project (see paragraphs 4.9 and 4.10)

Annex 3 - Annual Review of Risk Analysis

Details of the risk analysis issues recorded on the public register during 2023/24 (excluding regulated products and incidents).

Risk analysis issues that reach risk assessment were published on a public register in line with our openness policy. In 2023/24, 35 issues were recorded (+13 from 2022/23) as risk assessments were commissioned to inform risk management advice, in line with the process. 12 issues were complete (+7 from 2022/23). 1 issue no longer required risk analysis (+1 from 2022/23).

Issues completed prior to 2023/24 are not shown (5 issues in total).

Issues added during 2023/24 are marked with *

Completed during 2023/24.

Designated no further risk analysis during 2023/24.

Issue	Description	Estimated Completion
Dioxin & Polychlorinated Biphenyls (PCB) Risk Analysis	Consideration of the need for changes to risk management measures following a reduction in the Health Based Guidance Value for dioxins. This may include changes to existing regulatory limits in food and/or revised consumer advice.	Risk assessment anticipated end 2025 at the earliest.
Perfluorinated Alkyl Substances (PFAS) Risk Analysis	Consideration of risk management measures associated with Perfluorinated Alkyl Substances (PFAS), a broad range of often persistent industrial chemicals some of which have been reported in food.	Risk assessment anticipated end 2025 at the earliest.

Issue	Description	Estimated Completion
Analysis of the safety of Titanium Dioxide (E 171) as a Food Additive	On 6 May 2021, the European Food Safety Authority (EFSA) published an opinion on the safety of titanium dioxide (E 171) as a food additive. The EFSA panel concluded that E 171 can no longer be considered safe when used as a food additive. UK Scientific Advisory Committees will assess the EFSA opinion and any associated studies alongside the existing scientific evidence to provide a view on the safety of this permitted food colour. This will help inform what appropriate risk management action may be needed to safeguard consumers.	FSA risk assessment has now concluded, and the executive summary is due to be published shortly.
Risk analysis procedure for bamboo-plastic composite FCMs	Bamboo and similar plant-based materials are not considered to be authorised additives in plastic FCMs in accordance with Regulation 10/2011 (retained under domestic legislation in Great Britain), therefore a decision needs to be taken in respect of the GB market. The Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) recently published their interim position statement on these articles.	Now complete (2024/25) - Final COT statement and agreed risk management approach were published on 30 July 2024.
Environmentally sourced recycled plastic in food contact materials (FCMs). *[Previously named Ocean-bound plastic and plastic obtained from the environment used in food contact applications]*	The FSA and FSS are aware of the use of recycled plastic in FCM products that are in part, or fully, fulfilled using plastic material that has been obtained from the environment (ocean, 'ocean-bound' or land). We are carrying out risk analysis to assess the safety of using these materials in food contact applications.	The SACs (FCM Joint Expert Group and COT) have carried out an evaluation of this material. The final risk assessment statement is expected to be published shortly. Consideration of risk management advice will be provided after publication of the statement.
Review of T-2/HT-2 Toxins in Foods	Review of occurrence data for T-2/HT-2 toxins in cereals and assessment of the exposure of UK consumers to these toxins from cereals and cereal-based foods.	An initial risk assessment was provided to COT in July 2024. The next risk assessment phase will commence in the Autumn. The finalised risk assessment is anticipated March 2025 at the earliest. It is anticipated once the evidence package is provided to policy that risk management will be completed no earlier than the end of 2025.
Direct supply of Qurbani meat (including offal) to the final consumer (potential cold chain disruption) during Eid al-Adha	The FSA is evaluating whether there is any additional risk to consumers as a result of the supply and consumption of less than fully chilled Qurbani meat and offal during Eid al-Adha. This area of work has been split into two separate workstreams: (1) The short-term need for yearly (industry led) mitigations to be implemented during the annual Eid al-Adha festival. (2) the long-term proposal to enshrine the yearly (industry led) mitigations into legislation.	Workstream (1): FSA business guidance webpage (Supply of Qurbani Meat & Offal During Eid al-Adha) was updated for Qurbani 2024, informed by the completed risk assessment. Workstream (2): Work on the long-term approach to Qurbani is currently paused due to resource constraints.
Country Profiles - Imported Food of Non-Animal Origin (FNAO) Phase 1	The FSA Market Access Assurance Team will support the FSA Trade Risk Assessment Team in the production of Country Profiles for trading partners exporting food of non-animal origin (FNAO) to the UK. These profiles will assist the Market Access Assurance Team in monitoring the risk associated with each country and to inform on the need for follow-up action.	No further risk analysis

Issue	Description	Estimated Completion
Risk assessment on Avian Influenza infection via food chain	Production of an updated risk assessment for Avian Influenza in food, triggered by changes to consumer advice regarding egg consumption and the geographically widespread nature of Avian Influenza generating over 100 confirmed cases in the 2021/22 Avian Influenza season. This work has been initiated to ensure risk management advice for the consumption of poultry, wild game and raw eggs remains appropriate and is supported by the latest evidence on risks associated with Avian Influenza, especially with respect to vulnerable groups, taking into account developments in the spread of Avian Influenza.	Complete
Assessment of TMBPF-DGE for use in can coatings	Work to assess the safety of TMBPF-DGE, a substance used as a coating in metal food contact materials (for example, , aluminium food cans), is being undertaken to ensure its use in that context is appropriate in respect of the UK market. The assessment is being taken forward as TMBPF is considered as a potential alternative to bisphenol A (BPA), a substance that is more widely used in can coatings on the UK market but with specific restrictions in place.	The risk management advice, and risk assessment on which it is based, are expected to be published shortly.
Assessment of the risk to vulnerable consumers from Listeria monocytogenes in blue cheese	Assessment of the risk to vulnerable consumers from listeria monocytogenes in blue cheeses. There are inconsistencies in the advice provided by government partners to pregnant women on the consumption of blue cheese. A risk assessment will assess the risk to vulnerable consumers. FSA and FSS are working together to present consistent risk management advice underpinned by science and evidence.	Complete
Assessment of the risk to vulnerable consumers from Listeria monocytogenes in smoked fish	Assessment of the risk to vulnerable consumers, including pregnant women and people with weakened immune systems, from Listeria monocytogenes in smoked fish. This follows confirmation there has been an increase over the period 2020-22 in the number of cases of listeriosis linked to the consumption of smoked salmon by vulnerable groups. FSA and FSS are working with other Government departments to present consistent risk management advice underpinned by science and evidence.	Complete
Assessment of HPMA for use in can coatings	In 2012, EFSA assessed methacrylic acid, 2-hydroxypropyl ester (HPMA) for use in acrylic resin coatings for food cans at use levels up to 20%. The FSA will re-assess its suitability for use in coatings for placing onto the UK market.	The technical advice is due to be finalised and will be considered shortly alongside the work on TMBPF-DGE as appropriate.
Risk assessment of substrates used to rear insects for animal feed	The FSA has commissioned a comprehensive review of the safety of several currently non permitted substrates that could potentially be used to rear insect larvae for protein in animal feeds.	The report by Fera has been published (Supply of data requirement to assess the safety of currently non-permitted waste streams to be used for rearing insects for feed). The study provides chemical and microbiological data from model insect rearing systems using four currently non-permitted rearing substrates. This analytical data provides a key data set to be used in subsequent risk assessments. Permitting the use of a wider range of substrates will require amendments to Defra led regulations. Therefore, commissioning of subsequent risk assessments and risk management considerations will be taken forward by Defra.
Review of the prevalence of certain mycotoxins in animal feed	Work to increase understanding of group A Trichothecenes; T2, HT2, Diacetoxyscirpenol (DAS) and Neosolaniol (NEO) and determine their prevalence in retail pet foods.	The report by Fera has been published (Product Survey of Cat Food for Mycotoxins). Consideration is being given on whether to commission a risk assessment to determine the significance of lesser-known mycotoxins identified during the survey.

Issue	Description	Estimated Completion
Assessment of plant-based drinks	The SACN/COT working group on plant-based drinks is considering the benefits and risks of plant-based drinks in diets across all life stages. The outcome of this analysis will inform public health guidance on the suitability of these products for different sub-populations.	Initial risk assessment completed. Report has now been published for peer review. Final report anticipated spring 2025.
Vitamin D in infant and follow on formula	Review of the safety of vitamin D intakes from infant formula and follow on milks, in light of the updated regulations on the vitamin D content of these drinks and in the context of our existing advice for vitamin D supplementation in formula-fed babies.	The completed FSA risk assessment has been published and provided to DHSC risk managers.
Microbiological Risk Assessment to support development of advice and guidance to manage outbreaks of norovirus associated with consumption of raw oysters with respect to the amount of Norovirus contamination detected by real time reverse transcription polymerase chain reaction ISO15216*	The FSA is seeking to develop risk management advice in relation to Norovirus testing of oysters during outbreak situations, taking into account the amount of norovirus contamination detected and how this may lead to resumption of harvesting from oyster harvesting areas implicated in an outbreak.	Complete
Review of imported food and feed controls for assimilated Regulation 2019/1793 (2nd review)*	The appropriate authorities in Great Britain (GB) are responsible for reviewing and updating the import food legislation as required for assimilated Regulation 2019/1793. The appropriate authorities are the Secretary of State in England, Welsh Ministers in Wales and Scottish Ministers in Scotland. The appropriate authority is required to review the lists set out in the Annexes to the Regulation on a regular basis in order to consider new information related to risks and non-compliance. The Food Standards Agency (FSA) and Food Standards Scotland (FSS) have carried out a joint review of the lists in the Annexes contained in the Regulation. Updating the current controls requires a Statutory Instrument to be laid in each country (England, Wales and Scotland). This review is delivered through the joint FSA and FSS risk analysis process so that Ministers can make risk management decisions based on the FSA/FSS recommendations.	Now complete (2024/25)
Flexibility to increase the threshold for designation of low-capacity slaughterhouses*	Flexibility under Article 7 (1) (b) of REUL 2019/624 to increase the threshold for the designation of low-capacity slaughterhouses. This will allow the post-mortem inspection in those eligible slaughterhouses to be performed by the official auxiliary without the official veterinarian (OV) being at the slaughterhouse when this is carried out.	The risk assessment has been completed and provided to Defra to support its negotiations with the EU. In line with FSA/FSS openness policy, the risk assessment has not been published at this time as this relates to international negotiations.
Risk Profile - Live Bivalve Molluscs (LBMs): Oysters*	FSA work with the UK Office for SPS Trade Assurance (in Defra) to identify and characterise the hazards associated with oysters from different global regions.	Complete

Issue	Description	Estimated Completion
Titanium dioxide as a feed additive*	On 16 June 2021, the European Food Safety Authority (EFSA) published an opinion on the safety of titanium dioxide (E171) as a FEED additive (EFSA No.6630). The Panel concluded that E171 can no longer be considered safe when used as a feed additive. This was followed by the publication of Regulation (EU) 2021/2090 of 25 November 2021 concerning the denial of authorisation of titanium dioxide as a feed additive for all animal species, which came into force in the EU on 20th December 2021, with sequential transition periods of up to 6 months (to 20 June 2022). A parallel safety assessment of titanium dioxide as a FOOD additive (G10000050) is ongoing. The safety risk assessment for titanium dioxide as a feed additive will consider the conclusions from the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT) on the food additive prior to finalising the feed additive assessment.	Risk assessment phase due to conclude in early 2025.
Assessment of Bisphenol A (BPA)*	Review of latest evidence relating to the safety of BPA in food. The European Food Safety Authority (EFSA) published its updated Opinion in April 2023 and recommended that the tolerable daily intake (TDI) be reduced to 0.2 nanograms per kilogram of body weight per day.	COT reviewed the scientific basis and implications for risk management of the new EFSA tolerable daily intake (TDI) for BPA, and the subsequent assessment by the German Federal Institute for Risk Assessment (BfR). A final position statement was published at the end of June 2024 with COT agreeing to adopt the new TDI. We are currently considering risk management recommendations with a view to publishing outputs at the end of summer/during autumn 2024 at the earliest. A detailed COT statement to support approach is expected by spring 2025.
Assessment of the risk of allergic reaction from fortification of non-wholemeal wheat flour with folic acid*	UK Health Departments are pursuing a public health intervention to require the fortification of non-wholemeal wheat flour with folic acid at a level of 250 µg per 100 g of flour in order to prevent an estimated 200 babies being born each year with neural tube defects (for example, spina bifida and anencephaly). This work will assess the risk of allergic reaction arising from the fortification of non-wholemeal flour with folic acid at 250 µg / 100g of flour should this not be reflected on labelling or provided to consumers by other means to inform consideration of whether a limited transitional period may be provided.	Complete
Current Salmonella risk profile of UK-produced hen shell eggs*	The purpose of this request is to produce a risk profile summarising the changes since 2016 that may influence the risk posed by Salmonella in UK-produced shell eggs and determine whether these are significant to consider the need for an updated risk assessment. Our risk management goal is to ensure our advice on consumption of eggs, especially with respect to vulnerable groups, remains appropriate and is supported by the latest evidence on risks associated with Salmonella in UK-produced eggs.	Complete
Assessment of the Codex Expert Committee reports on establishing allergen thresholds*	A full report recommending harmonised international allergen thresholds for global priority allergens to inform precautionary allergen labelling by the Codex 'Expert Committee' was published in autumn 2022. COT were asked to assess the report and comment on whether the recommended reference doses are based on a robust scientific approach.	The assessment of the Codex report on food allergen thresholds has been published. We are now using the COT assessment to inform our input in Codex work on allergen thresholds
Risk to consumers from Campylobacter in small broiler slaughterhouses*	Determine the risk to human health and the population of the UK posed by broiler carcasses from slaughterhouses compared to those testing against Campylobacter process hygiene criterion (PHC); and to establish an appropriate frequency of sampling for individual, small slaughterhouses. The aim is to reduce contamination in poultry carcasses which would lower public health risk of exposure via poultry meat, which is attributed as main source for human campylobacteriosis.	The risk assessment (Risk of campylobacteriosis from low-throughput poultry slaughterhouses) has been published.

Issue	Description	Estimated Completion
Review of imported food and feed controls for assimilated Regulation 2019/1793 (3rd review)*	The appropriate authorities in Great Britain (GB) are responsible for reviewing and updating the import food legislation as required for assimilated Regulation 2019/1793. The appropriate authorities are the Secretary of State in England, Welsh Ministers in Wales and Scottish Ministers in Scotland. The appropriate authority is required to review the lists set out in the Annexes to the Regulation on a regular basis in order to consider new information related to risks and non-compliance. The Food Standards Agency (FSA) and Food Standards Scotland (FSS) have carried out a joint review of the lists in the Annexes contained in the Regulation. Updating the current controls requires a Statutory Instrument to be laid in each country (England, Wales and Scotland). This review is delivered through the joint FSA and FSS risk analysis process so that Ministers can make risk management decisions based on the FSA/FSS recommendations.	The risk categorisation commissioned for the third high risk food and feed products not of animal origin (FNAO) review has been completed. The Statutory Instrument is due to be completed by late 2024 / early 2025.
Risk Profile – Honey*	FSA work for the UK Office for Sanitary and Phytosanitary (SPS) Trade Assurance (in Defra) to identify and characterise the hazards associated with honey from different global regions.	Now complete (2024/25) - the risk profile was published in July 2024.
Risk to consumers from consumption of red meat produced in small throughput slaughterhouses due to Process Hygiene Criteria sampling exemptions*	Determine the risk to human health and the population of the UK posed by red meat carcases (cattle, sheep, goats and pigs) from slaughterhouses that are currently exempt from sampling for Process Hygiene Criteria (PHC) compared to those testing against PHC.	The risk assessment phase is expected to be completed in September 2024 at the earliest.

Annex 4 - FSA Science Publications

As part of our impact workstream, we monitor access to FSA research projects published on food.gov.

The top 5 research projects which have seen the most page visitors from November 2023 – June 2024 (footnote 15)

1. Storing chilled foods at incorrect temperatures 1461 visitors
2. Kitchen Life 2 1406 visitors
3. Surveillance Sampling Programme 1178 visitors
4. Consumer Insights Tracker 1018 visitors
5. Local Authority Capacity and Capability: Executive Summary 958 visitors

The top 5 science landing pages which have seen the most page visitors from November 2023 – June 2024

1. Food hypersensitivity 3163 visitors
2. Food and You 2 2719 visitors
3. National Diet and Nutrition Survey (NDNS) 1971 visitors
4. Foodborne pathogens 1769 visitors
5. Food and you 802 visitors

The top 5 risk assessments which have seen the most page visitors from November 2023 – June 2024

1. Rapid Risk Assessment: What is the long-term risk of erucic acid to UK consumers if sunflower oil in food is substituted with refined rapeseed oil? (Oct 2022) 15251 visitors

2. Risk assessment to support guidance for norovirus outbreaks in oysters (Oct 2023) 1464 visitors

3. Rapid Risk Assessment: Risk to UK consumers from Highly Pathogenic Avian Influenza (HPAI) H5N1 B3.13 in US dairy products (May 2024) 999 visitors

4. Safety Assessment: Synthetic Cannabidiol (CBD) as a novel food for use in food supplements (April 2024) 548 visitors

5. Safety Assessment: Outcome of assessment on an application under the Novel Foods Regulation 2015/2283 as retained in UK Law for Barley Rice Protein (Jan 2024) 297 visitors

Published risk assessments from November 2023 – June 2024

6. Rapid Risk Assessment: What is the long-term risk of erucic acid to UK consumers if sunflower oil in food is substituted with refined rapeseed oil? (Oct 2022) 15251 visitors
7. Risk assessment to support guidance for norovirus outbreaks in oysters (Oct 2023) 1464 visitors
8. Rapid Risk Assessment: Risk to UK consumers from Highly Pathogenic Avian Influenza (HPAI) H5N1 B3.13 in US dairy products (May 2024) 999 visitors
9. Safety Assessment: Synthetic Cannabidiol (CBD) as a novel food for use in food supplements (April 2024) 548 visitors
10. Safety Assessment: Outcome of assessment on an application under the Novel Foods Regulation 2015/2283 as retained in UK Law for Barley Rice Protein (Jan 2024) 297 visitors

Published risk assessments from November 2023 – June 2024 (footnote 16)

1. RP1642 Assessment of Wax, Rice Bran, Oxidized and Saponified as a Component of Plastic Materials and Articles Intended to Come into Contact with Food
2. Safety Assessment RP1190 2-Hydroxyethyl Methacrylate Phosphate
3. An assessment of the risk of companion animals acquiring Salmonella, Escherichia coli spp., Campylobacter spp. and MRSA from contaminated raw pet food, and associated risks to pet owners from the use of these product in the home.
4. Safety Assessment RP16 Chromium Chelate of DL-Methionine
5. Rapid Risk Assessment: Risk to UK consumers from Highly Pathogenic Avian Influenza (HPAI) H5N1 B3.13 in US dairy products
6. Safety assessment: Cannabidiol (CBD) isolate as a novel food for use in a range of food categories including food supplements
7. Safety assessment: Synthetic Cannabidiol (CBD) as a novel food for use in food supplements
8. Safety assessment: Calcidiol (25-hydroxycholecalciferol monohydrate) as a novel food for use in food supplements
9. Safety Assessment RP1372 Genetically Modified 73496 Oilseed rape
10. Safety Assessment RP1506 Genetically Modified DP4114xMON810xMIR604xNK603 Maize and sub-combinations
11. Safety Assessment RP188 Genetically Modified Soybean A5547-127
12. Safety Assessment RP212 Genetically Modified Soybean 40-3-2
13. Safety Assessment RP608 Genetically Modified GHB614 Cotton
14. Assessment RP1565 Genetically Modified Soybean MON 87701
15. Assessment RP1566 Genetically Modified Soybean MON 87701 x MON 89788

16. Assessment RP1569 Genetically Modified 281- 24-236 × 3006-210-23 Cotton
17. Assessment RP1585 Genetically Modified MS8, RF3, and MS8 × RF3 Canola
18. Safety Assessment RP1411 Schizochytrium sp. oil rich in DHA and EPA
19. Safety Assessment RP1112 Modification of use of Steviol Glycosides (E 960) produced by Fermentation
20. Safety Assessment RP1466 2-Hydroxy-4-methoxybenzaldehyde
21. Safety Assessment RP1123 Genetically Modified GMB151 Soybean
22. Safety Assessment RP1232 Genetically Modified GHB811 Cotton
23. Safety Assessment RP652 Genetically Modified MIR162 Maize
24. Assessment RP1249 All-rac-alpha-tocopheryl Acetate (Vitamin E)
25. Assessment RP1359 Lactiplantibacillus plantarum (previously Lactobacillus plantarum) DSM 19457
26. Assessment RP1367 Lactiplantibacillus plantarum DSM 23375
27. Safety Assessment RP1047 Quillaja saponaria and Yucca schidigera (Magni-Phi®)
28. Safety Assessment RP746 alpha-galactosidase and endo-1,4-betaglucanase (Agal-Pro BL and Agal-Pro BL L®)
29. Safety Assessment RP709 protease (subtilisin) produced by Bacillus licheniformis DSM 33099 (ProAct 360)
30. Safety Assessment: Magnesium L-threonate as a novel food for use in food supplements
31. Safety Assessment: Change of conditions of use for the novel food, isomalto-oligosaccharides
32. Assessment RP1527 Lactiplantibacillus plantarum (formerly Lactobacillus plantarum) NCIMB 30083
33. Assessment RP1528 Lactiplantibacillus plantarum (formerly Lactobacillus plantarum) NCIMB 30084
34. Safety Assessment RP1087 Guanidinoacetic acid (Creamino®)
35. Assessment RP1051 All-rac-alpha-tocopheryl acetate (Vitamin E)
36. Rapid Risk Assessment: What is the risk from microcystins in the edible flesh of fish caught from Lough Neagh?
37. Safety Assessment RP593 Hostazym C
38. Safety Assessment RP597-600 Carophyll
39. Safety Assessment RP666 Protural
40. Safety Assessment RP686 L. Lactis
41. Safety Assessment RP694 S. Cerevisiae
42. Safety Assessment RP748 Coxam
43. Safety Assessment RP791 L. Buchneri
44. Safety Assessment RP1307 PARNUT Colic Sachet
45. Safety Assessment RP226 Xygest HT
46. Safety Assessment RP309 Hostazym X
47. Safety Assessment RP416 Axtra XB
48. Safety Assessment RP420 Axtra Phy Gold
49. Risk assessment for vulnerable consumers from Listeria monocytogenes in blue cheese
50. Oyster Risk Profile
51. Safety Assessment: Outcome of Assessment of the Modification of use of Steviol Glycosides (E 960) Produced by Yarrowia lipolytica

FSA reports published from November 2023 – June 2024

1. Guidance for Point of Contact Technologies
2. Animal product imports project: public health expert opinion elicitation
3. Patterns and Prevalence of Adult Food Allergy
4. Making Food Better Tracker Survey 2023
5. Food and You 2: Technical Report
6. Food and You 2: Wave 7 Key Findings
7. Food and You 2: Wave 7

8. Consumer Insights Tracker March 2024
9. Northern Ireland Take Home Food and Drink Purchases 2018 to 2022
10. What's on the children's menu?
11. National Monitoring Plan for POAO: Data Analysis Report 2022-23
12. Consumer Insights Tracker February 2024
13. Vegan labelling: use and understanding by consumers with food hypersensitivities
14. Review of methods for the analysis of culinary herbs and spices for authenticity
15. Draft guidance on Mechanically Separated Meat (MSM) for the consultation
16. Surveillance Sampling Programme
17. Nitrate Surveillance Monitoring Program Annual report (April 2022 to March 2023)
18. Consumer Insights Tracker January 2024
19. Food allergy awareness champions: Improving food safety standards in online food procurement for people with food hypersensitivities
20. Consumer Attitudes Towards Potential Divergence of Food Safety Regulations Within the UK
21. Consumer Insights Tracker December 2023
22. Consumer views of potential regulatory divergence in the meat sector
23. A survey of AMR E. coli and Listeria spp. on raw, prepacked, farmed salmon fillets on retail sale in the UK (FS900350)
24. Food and You 2: 2020-2023 trends: Weighting note
25. Consumer Insights Tracker November 2023
26. Food and You 2: 2020-2023 trends report
27. Food and You 2: 2020-2023 trends
28. Food and You 2: Northern Ireland Wave 5-6 Key Findings
29. Product Survey of Cat Food for Mycotoxins
30. Reactions and near misses to food in children and adults with food hypersensitivities
31. Food Hygiene Rating Scheme (FHRS) Food and You 2: Wave 6
32. Knowledge of Antimicrobial Resistance (AMR) amongst Food Handlers
33. School Food Standards Compliance Pilot: Discovery and Feasibility Research
34. A survey of antimicrobial resistant (AMR) E. coli, Campylobacter and Salmonella on chicken and turkey meat on retail sale in the UK (2022)
35. Exploring the chopping board microbiome – lessons learned.
36. Learnings from the pilot Citizen Science and AMR project
37. Citizen Science for Food Standards Challenges: Programme Review
38. National Reference Laboratory annual literature review on anisakis 2022-23
39. Consumer Insights Tracker October 2023
40. Anisakis UV press method: training workshop attendance report
41. Introduction of a Campylobacter proficiency testing scheme for food laboratories
42. Local Authority Capacity and Capability research
43. Radioactivity in Food and the Environment (RIFE) report 2022

Peer review publications with FSA authors from November 2023 – June 2024

1. Doerr et al., 2024. A UK framework for the assessment and integration of different scientific evidence streams in chemical risk assessment. Regul. Toxicol. Pharmacol. 151. https://doi.org/10.1016/j.yrtph.2024.105652

2. Mathisen et al., 2024. Time for CHANGE: system-level interventions for bringing forward the date of effective use of NAMs in regulatory toxicology. Arch. Toxicol. https://doi.org/10.1007/s00204-024-03802-6

3. Mead et al., 2024. Does urban agriculture contribute to food security, and how might this be achieved? Proc. Nutr. Soc. https://doi.org/10.1017/S0029665124002209

4. Merrick et al., 2024. A genetically related cluster of Salmonella Typhimurium cases in humans associated with ruminant livestock and related food chains, United Kingdom, August

2021-December 2022. Epidemiol. Infect. https://doi.org/10.1017/S095026882400030X

5. Osborne et al., 2024. The new normal chemical landscape: the future of risk assessment toward optimum consumer safety. Toxicol. Res. 13. https://doi.org/10.1093/toxres/tfae016

6. Silva et al., 2024. A novel method to derive a human safety limit for PFOA by gene expression profiling and modelling. Front. Toxicol. 6. https://doi.org/10.3389/ftox.2024.1368320

7. Thom et al., 2024. The effect of timers and precommitments on handwashing: a randomised controlled trial in a kitchen laboratory. Behav. Public Policy. https://doi.org/10.1017/bpp.2023.33

Peer review publications acknowledging FSA funding or data from November 2023 – June 2024

1. Jones et al., 2023. National Diet and Nutrition Survey data reveal a decline in folate status in the United Kingdom population between 2008 and 2019. American Journal of Clinical Nutrition. https://doi.org/10.1016/j.ajcnut.2023.10.006

2. Willis et al., 2023. A survey of Salmonella, Escherichia coli, and antimicrobial resistance in frozen, part-cooked, breaded, or battered chicken products on retail sale in the UK. Journal of Applied Microbiology. https://doi.org/10.1093/jambio/lxad093

3. Duggett et al., 2023. Genomic surveillance of extended-spectrum cephalosporin-resistant Escherichia coli isolated from poultry in the UK from 2016 to 2020. Frontiers in Microbiology. https://doi.org/10.3389/fmicb.2023.1335173

4. James et al., 2023. A Critical Review of AMR Risks Arising as a Consequence of Using Biocides and Certain Metals in Food Animal Production. Antibiotics. https://doi.org/10.3390/antibiotics12111569

5. Foong et al., 2024. Biomarkers of peanut allergy in children over time. Allergy: European Journal of Allergy and Clinical Immunology. https://doi.org/10.1111/all.16193

6. Koistinen et al., 2024. Metabolic changes in response to varying whole-grain wheat and rye intake. npj Science of Food. https://doi.org/10.1038/s41538-024-00247-0

7. Farkas et al., 2024. Assessment of wastewater derived pollution using viral monitoring in two estuaries. Marine Pollution Bulletin. https://doi.org/10.1016/j.marpolbul.2024.116081
8. Palau et al., 2024. Yersinia enterocolitica biovar 1A: An underappreciated potential pathogen in the food chain. International Journal of Food Microbiology. https://doi.org/10.1016/j.ijfoodmicro.2023.110554
9. Knibb et al., 2024. Risk assessment behaviour when eating out in adults with food hypersensitivity. Clinical and Translational Allergy. https://doi.org/10.1002/clt2.12336
10. Warner, 2024. Artificial food additives: hazardous to long-term health. Archives of Disease in Childhood. https://doi.org/10.1136/archdischild-2023-326565
11. Grant et al., 2024. Analysing Data With Members of a Stigmatised Community: Experiences, Reflections and Recommendations for Best Practice From the Finding the Formula Community Analysis Group. International Journal of Qualitative Methods. https://doi.org/10.1177/16094069241229983
12. Meyer et al., 2024. Dietary index based on the Food Standards Agency nutrient profiling system and risk of Crohn's disease and ulcerative colitis. Alimentary Pharmacology and Therapeutics. https://doi.org/10.1111/apt.17835
13. Semaan et al., 2024. Evaluation of Food Homogenates on Cell Survival In Vitro. Food and Environmental Virology. https://doi.org/10.1007/s12560-024-09586-3
14. Shaheen et al., 2024. Meat provenance - Advances and opportunities in rapid spectral techniques for authentication of dietary background and geographical origin of meat.

Trends in Food Science and Technology. https://doi.org/10.1016/j.tifs.2024.104557
15. Maskrey et al., 2024. Seasonal profile of common pharmaceuticals in edible bivalve molluscs. Marine Pollution Bulletin. https://doi.org/10.1016/j.marpolbul.2024.116128

16. Bloomfield et al., 2024. Genomic characterization of Pseudomonas spp. on food: implications for spoilage, antimicrobial resistance and human infection. BMC Microbiology. https://doi.org/10.1186/s12866-023-03153-9

17. Smith and Rigby, 2024. The significance of lead entering the human food chain via livestock ingestion from the agricultural use of biosolids, with special reference to the UK. Science of the Total Environment. https://doi.org/10.1016/j.scitotenv.2024.172135

Annex 5 - FSA Research & Evidence (R&E) Governance Overview

Financial year	Timing	Step	Inputs / outputs
Previous	Q3	FSA business planning	
	Q4	SERD budget set for following year	• Output: R&E budget allocation
Current	Q1	Review of REP portfolios & existing project evaluation	• Output: New research questions created • Output: Revised ARI
	Q2	Idea generation with science & policy	• Input: identified knowledge gaps from Q1 review • Output: Annual Science Update for Board (September) • Output: ARI published (every 1-2 years)
	Q3	REP future portfolio development: 1. REP Delivery Groups develop new REP pipeline and first step prioritisation 2. SERD SLT review 3. FSA BDG oversight group approval	• Input: Board feedback and strategic oversight (from Board paper) • Input: Science Council & ACSS assurance • Input: CSA and Science Director review • Output: refreshed REP pipeline of potential projects • Output: REP paper for BDG

Financial year	Timing	Step	Inputs / outputs
	Q4	Final set of new projects agreed for next year and assigned to contract managers to set up	• Input: EMT oversight and sign-off
Next	Q1-4	Commissioning and delivery of new projects	• Output: new projects • Output: project outputs and impact

Supporting notes:

- **REP Delivery Groups (DG):** each chaired by a SERD deputy director, these DGs consist of both science technical leaders (senior scientists) and relevant policy customers, supported by a research team secretariat. They take a ‘bottom-up’ approach to identifying knowledge gaps across each of the REPs, creating research questions and agreeing an initial ranking of ideas (based on a simple scoring matrix: scientific need, business need, delivery feasibility). The DGs can take advice from other sources (such as external review as for AMR).
- **SERD SLT (senior leadership team) review**: once initial REP review has been completed, the SERD’s SLT completes a ‘sense-check’ triage to consider balance across the whole portfolio and alignment with FSA strategic priorities. It identifies areas for further review.
- **FSA BDG (Business Delivery Group) oversight group**: the final step is cross-FSA approval at deputy director level to challenge and agree prioritisation, ensuring the agreed future research portfolio is aligned to FSA business needs.
- **Role of Science Advisory Committees:** as a process improvement on previous years, we now have named Science Council (SC) members (with appropriate expertise) assigned to each REP. Their role will be to provide independent challenge and assurance to the REPs. A similar approach is also being developed to allow the Advisory Committee on Social Science (ACSS) to play a similar role and provide social research expertise. In addition, REP DGs can ask specific technical SACs or sub-groups for input, as required.
- **Supporting business processes**: in addition to the assurance steps described above, there is also effective governance and tracking process in place to manage risks, uncertainty, finances etc. This creates a set of standards that applies to all research and evidence projects, and which are periodically reviewed. This is all supported by the REP Portfolio Tool, which allows monitoring of projects that are currently underway and ensures new ideas are captured as a pipeline of potential future work.

Annex 6 - New Areas of Research Interest (ARI)

The issues influencing food and feed safety?and?standards,?and their impact on consumers in the food system are wide ranging, meaning our Areas of Research Interest (ARI) are broad. Our ARI are the research questions we most?want?to address to promote and protect public health by ensuring that UK consumers are well informed and have sustainable access to foods which are safe, traceable, and properly labelled

The FSA first published its ARI in 2017 and they have been refreshed periodically to ensure they are relevant to the evolving priorities of the organization. This latest list below represents the current needs of the FSA.

By disseminating and communicating our updated ARI, we aim to grow our evidence base by engaging with others and thus be better prepared for the future. Specifically, we are looking to create opportunities to build and extend collaborations including developing joint initiatives?to enable a full understanding of the food system and the impact of interventions. We also intend to continue to contribute to the prioritization activities of partners and support research providers working at the cutting-edge of innovation to enable them to demonstrate significant impact on the food system and consumer protection.

We have identified four research priorities, which align to our coordinated research and evidence programmes. Within each of these priorities, there are seventeen ARI which are high-level research questions, and then under each of these ARI, we have more detailed questions, giving a detailed view of specific areas where we seek to advance our knowledge and/or improve our scientific capabilities.

1. Foodborne Disease and AMR

1.A. Driven by global changes in the food system, what new pathogens or strains are likely to become prevalent over the next 5 years and what mitigations are needed to avoid food safety issues?

1.B. Which emerging methods (for example, diagnostics, genomics, and data analytics), will help the FSA most effectively detect sources of infection or the emergence of new microbiological hazards in the food supply chain?

1.C. What are the drivers of poor food hygiene behaviours in households & food businesses, and how can food safety knowledge be best translated into safer practices?

1.D. What is the food safety risk posed by AMR, now and in the future, and how can the FSA best monitor changing patterns of AMR risk and ensure that consumers and businesses understand what they can do to reduce risk?

1.E. What are the most effective strategies or interventions that can be deployed by food businesses to control the spread of pathogens and reduce foodborne disease?

2. Chemical Radiological and Food Hypersensitivity risks

2.A. What new analytical tests or novel approach methods can we use to assess these hazards and their impact on consumers?

2.B. How can we use business and consumer behaviour insights to deliver better food hypersensitivity outcomes and improve risk communication?

2.C. How will dietary and other consumer-driven shifts in the food system change chemical, radiological and allergen risks over the next 5 years and how can we better anticipate them?

2.D. Are there specific safety risks associated with changes in the food chain that are intended to have environmental benefits (such as novel food packaging and other food contact materials) and what can be done to mitigate these risks?

3. Regulated Products

3.A. What post marketing monitoring methods can be used to identify, quantify and investigate emerging food safety issues in the UK population from foods introduced into our food supply?

3.B. How can we assess the health risks, if any, associated with long-term exposure to ingredients, particularly novel foods, including exposure to multiple different food ingredients?

3.C. Alongside assessment of safety, how can we reliably and consistently assess the health and/or sustainability impacts associated with food products and processes particularly making explicit claims?

4. Regulating the changing food system

4.A. What analytical frameworks and approaches (for example, behavioural science) help the FSA predict risky food businesses and inform risk profiling so that we and others (for example Local Authorities) can focus our limited resources on the issues that are highest risk and where interventions can be most effective?

4.B. What proxy data is available alongside routine sampling to spot risks for and impact on safety, authenticity, and other standards of UK food for import control?

4.C. What new detection methods and analytical approaches can be used to spot food fraud and non-adherence to regulation more rapidly?

4.D. What opportunities and threats to a safe and trustworthy food system are emerging, for example new technologies, social change, new legislation, or changes to the labour market, and what sources of intelligence, scientific methods and foresight can help FSA anticipate them?

4.E. What interventions can a food regulator make across the food system to encourage healthier and/or more sustainable food?

1. Annual FSA Science Update | Food Standards Agency
2. Annual Science Update from the FSA's Chief Scientific Adviser | Food Standards Agency
3. https://www.food.gov.uk/search?keywords=&filter_type%5BResearch%20and%20evidence%5D=Resear
4. https://doi.org/10.1099/jmm.0.001753
5. UK 5-year action plan for antimicrobial resistance 2024 to 2029 - GOV.UK (www.gov.uk)
6. Precautionary Allergen Labelling and Allergen Thresholds
7. https://doi.org/10.46756/sci.fsa.lvn457
8. https://doi.org/10.46756/sci.fsa.ehu454
9. https://www.food.gov.uk/research/food-and-you-2
10. https://doi.org/10.46756/sci.fsa.nfy518
11. https://doi.org/10.46756/sci.fsa.nct227
12. https://doi.org/10.46756/sci.fsa.gsy115

13. https://www.food.gov.uk/board-papers/annual-science-update-from-the-fsas-chief-scientific-adviser

14. Hazard identification: identification of hazards in cultured animal cells (food.gov.uk)

15. The period from the last annual science report to when this report was drafted

16. The period from the last annual science report to when this report was drafted