

SCIENCE UPDATE 2018

Report by Steve Wearne, Director of Policy and Science

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SUMMARY

1. This paper gives an annual update on FSA's science, including:
 - an analysis of FSA's science spend and priorities; and
 - progress on developing science capability and assurance on FSA science and its use.
2. The Business Committee is asked to:
 - **discuss** the current, past and forecast future science spend and resource and developing priorities, in preparation for the Board's substantive discussion on the 2019/20 budget; and
 - **discuss** the advice of the Science Council on our science capability and assurance, and the proposed actions in these areas.

INTRODUCTION

3. This annual update to the Business Committee sets out the FSA's current, past and projected spend and resource on science, and discusses recent and potential future trends and priorities. Science is core to the FSA; shaping our strategic priorities and informing and assessing their delivery. This performance report from the executive complements the annual strategic discussions at the March 2018 Board¹ based on reports from the FSA Chief Scientific Adviser and the Chair of the Science Council. Both form part of the framing for the Board's discussion of priorities and planning for the 2019/20 financial year, planned for January and March 2019.
4. In establishing the Science Council, we asked them to advise the FSA Board on: "how it can be confident that the FSS has access to the right science capability and is using science to the best of its ability". This report covers the Council's recommendations and the proposed actions to progress in capability and assurance in FSA science.

EVIDENCE AND DISCUSSION

5. We assess FSA's science spend and capability across the three main areas of our science activity: externally commissioned science, internal science capability (work done by FSA staff); and external expertise (primarily the Science Advisory

¹ See papers for March 2018: <https://www.food.gov.uk/about-us/fsa-board-meeting-march-2018>

Committees and the Science Council; this also includes independent reviewers etc.).

- Examples of the impact that investment in science has on the delivery of FSA priorities are given in Annexe 1. Further data and analysis on different aspects of FSA science spend and resource is provided in Annexe 2.

External Science

- FSA's spend on externally-commissioned science is categorised as *Core*, *Investment* or *Strategic*, each supporting development and delivery of FSA priorities/activities in a different way (Figure 1).

Figure 1: Examples of FSA external science by spend categorisation

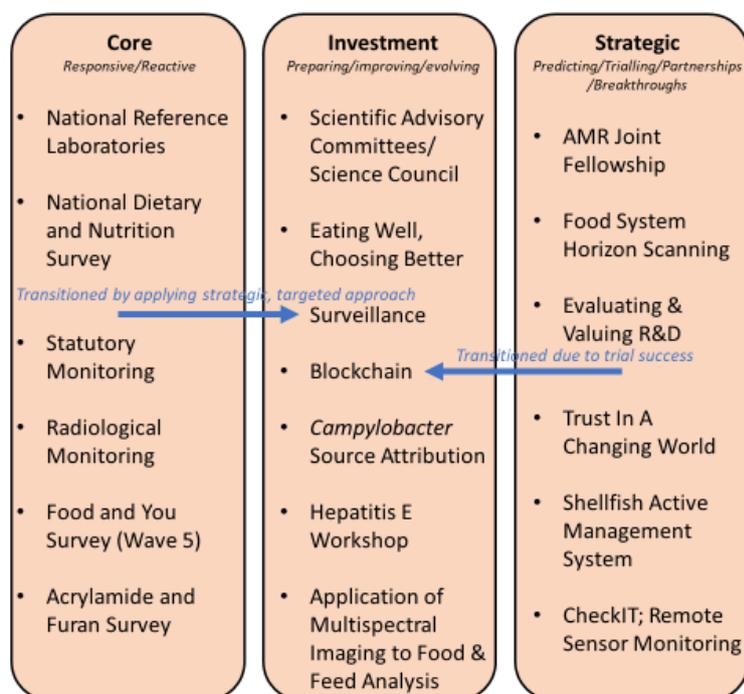
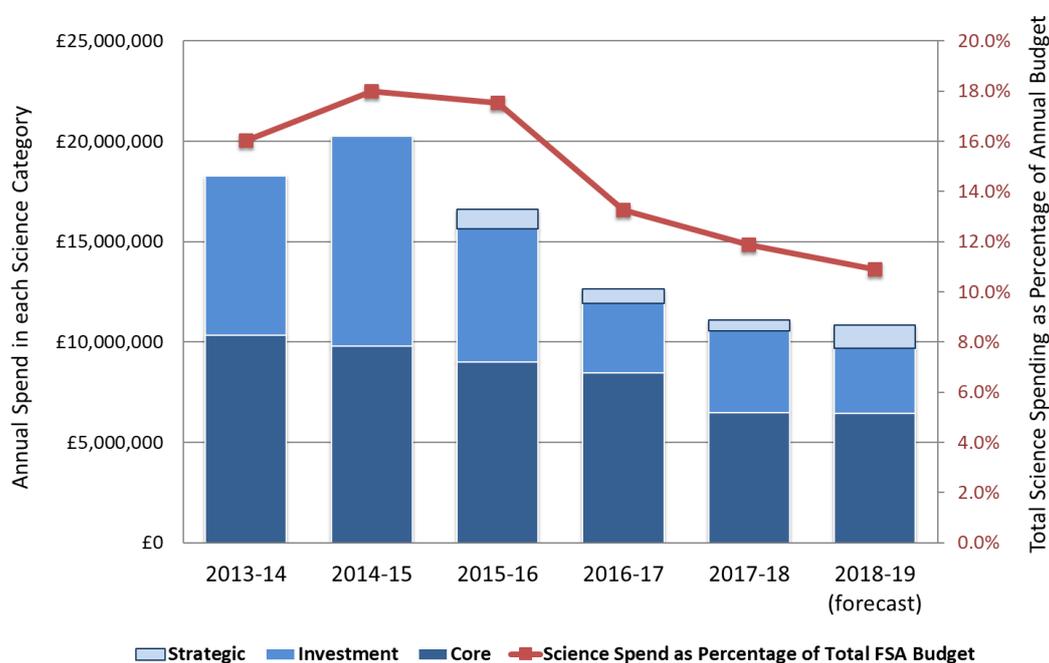


Figure 2: External science spend & total science spend as proportion of FSA budget 2013-19



Patterns and trends

8. Science is core to the FSA and we have responded to the declining trend in science spend (Figure 2). The forecast 2018/19 total science spend has largely stabilised compared to 2017/18. Within these totals, we highlight some trends:
 - i Increased exploitation of the Strategic Evidence Fund compared with previous years. We have strengthened management of this fund and it is supporting several exceptional pieces of work, including our pioneering work within government on Blockchain, and strategic partnerships, such as the Quadram Institute Fellowship.² The work on Blockchain has been so successful in proving utility for FSA that its further development and wider exploitation is being taken forward as part of our 'investment' portfolio.
 - ii An ongoing shift in the balance of spend from *core* to *investment* and *strategic*, in line with the trajectory approved by the Board. This is achieved both through increasing efficiency of how we deliver *core* work and innovating so that the work is more directly focused on priorities set by FSA – illustrated by the shift of our surveillance work from the old approach (*core*) to the new strategic surveillance (*investment*, targeting FSA priorities).

² This is also discussed in Paper FSA 18-09-10 in the context of the FSA's work on AMR, see note 3 below:

- iii At a lower level of detail, there are also regular cycles in the level and type of spend on specific objectives, as they mature. For example, spend on *Campylobacter* has reduced in recent years as we moved from understanding the basic nature of the problem to designing and then testing the impact of interventions and most recently, to agreeing with retailers that they should publish their own monitoring data rather than additional monitoring being funded from the public purse. Conversely, the spend on AMR is increasing as we invest in work to understand and then address gaps, building the evidence base to develop and assess interventions.

Future priorities

9. Proposals for science spend in 2019/20 and beyond will be developed alongside other investments in the business planning cycle and discussed by the Board in January and March 2019. The internal process leading to these Board discussions will include review of existing spend to ensure that projects are still needed and focused on current and future priorities.
10. We would expect future science priorities to continue the trends outlined above. Strategic work will develop further fellowships and partnerships, and identify opportunities to invest in new work informed by the insights and access to expertise generated by our fellowships on AMR/genomics, data, and behavioural insights. We anticipate more work on AMR, informed by our work to date including that of the ACMSF Task and Finish Group,³ and science to keep us at the forefront of risk assessment. The new Advisory Committee for Social Science will help us identify opportunities to invest in social science focused on FSA priorities, and, looking further forward, the proposed new Science Council Working Group on Data Science will help us identify where we can best invest to further exploit use of data, advanced diagnostics and artificial intelligence (including for RoF and our future operations).

Co-funding, partnerships and leverage

11. We have pushed to increase our co-funding, partnerships, and leverage, which added value and impact and lever other work to FSA priorities. This is reflected in a higher level of co-funding in 2017/18 and in 2018/19, compared with recent years, with some 12% of FSA science projects currently co-funded, representing 18% of total science spend (Annexe 2; Figure 1). Examples include:
 - Strategic partnership: FSA co-funds a 5-year fellowship with the Quadram Institute, on use of cutting-edge 'omics to manage risks of pathogens and AMR, and access to the wider capability in this new, £81.6m facility;
 - Expert networks: FSA co-funds the Virtual Authenticity Network with Defra and Food Standards Scotland – an open access, trusted source to share and gather information on food authenticity; and

³This paper is available here: <https://www.food.gov.uk/about-us/our-board>

- Core data: FSA co-funds the National Diet and Nutrition Survey which provides the core data the food eaten by UK consumers⁴.
12. There are significant opportunities to further exploit co-funding including through cross-governmental initiatives such as the Industrial Strategy Challenge Fund and the new Strategic Priorities Fund set up by UK Research and Innovation. Influencing such programmes has been a focus of the FSA Chief Scientific Adviser in 2018. We also intend to draw on the report from the Science Council Working Group on Science Capability & Assurance, which the Board will consider in detail at its December meeting, helping us to maximise access to co-funding opportunities, influence others' research calls and leverage funds.
 13. As noted in the CSA's report to the Board in March 2018, access to external science relies both on having the available budget and having staff capability and capacity to develop and deliver beneficial projects. The development of the SEF and many of our most successful and impactful science projects (Annexe 1) have arisen from individual staff going above and beyond to lead work. Greater availability of staff time provides the opportunity to develop even better science.

Internal Science Capability

14. Our internal science capability can be categorised into three types:
 - I. Scientific specialists, performing for example in-house risk assessments or economic analysis;
 - II. Scientific management roles, for example defining and directing research and managing external expert advice, interpreting results, and acting as science business partners; and
 - III. Roles requiring basic scientific 'literacy'; knowing when science is needed, how to access it and to work with science providers to use the outcomes effectively to inform decisions i.e. intelligent scientific 'customers'.
15. We will draw on the report from the Science Council Working Group on capability and assurance to help us understand how we can develop and support capability in each group, and ensure they are linked together effectively.
16. The FSA's in-house scientific specialist capability is a priority area for current and future planning. Our spend (in staff resource) in 2017/18 was £2.6m, representing an increase of £0.5m (6.9 FTE) compared to 2016/17.
17. We expect spend in-house capability to increase significantly in 2018/19. We have launched a broad recruitment exercise for science posts focusing on in-house chemical and microbiological risk assessment capability, scientific committee support and science governance. We are looking to fill 36 new

⁴ DH pays the bulk of the costs; FSA pays 10% of the £5m core cost; FSA NI and Wales pay for additional sampling in those countries to allow for analysis at country level. Safefood and DHSSPH NI also contribute.

positions across the Science and Policy Directorate, at a range of grades. This represents a significant increase in science capacity in preparation for EU Exit, and reflects and supports the work we are doing to strengthen our risk analysis processes, described in more detail in Paper FSA 18-09-09 for the September Board.⁵

Accessing and using external expertise

18. Our external expert capability includes the Scientific Advisory Committees (SACs) and Science Council, as well as access and use of other external expert advice such as programme advisers and peer reviewers. These are core components of the FSA's scientific capability. This is supported by FSA staff resource (secretariat support and associated costs) and a relatively smaller programme spend (which covers the cost of meetings, members' fees and expenses, categorised as 'investment' within external science).
19. The total cost of FSA's use of SACs and the Science Council in 2017/18 was £714,749 (further detail in Annexe 2; Table 2). This is a significant increase since the FSA's Triennial Review of its SACs in 2016, when total spend was estimated at £581,000. Changes in structure and composition of the SACs will have affected these totals⁶ but the principal reason is a shift in our mode of engagement with SACs, working more closely with them to outline and then address well-defined tasks relating to priority issues for FSA. This requires a greater investment of time, which pays back in delivery of authoritative advice which helps FSA identify and address its priorities. The ACMSF Task and Finish Group is a good example of this.
20. As noted in the CSA's report to the Board in March 2018, there are challenges in increasing our access to expertise, including the limited pool available in some areas and the difficulties we have experienced in attracting relevant experts to roles on some of our Advisory Committees.
21. The Science Council Working Group on Capability and Assurance has considered how FSA can best develop its access to and use of external capability, including how we attract and engage with external experts and we intend to draw on their advice in shaping future plans and priorities.

Science Assurance

22. As outlined to the December 2017 Board, our approach focuses at present on quality, relevance and impact (primarily for FSA and its priorities but also for others). We use internal and external expert peer review and other quality assurance tools on proposals for and outputs of commissioned science (and work done internally), and we look to assure a clear link from science to FSA. We also carry out periodic review at the level of large programmes to consider how science has impacted on policy and how needs and priorities for science

⁵ Please find this paper available here: <https://www.food.gov.uk/about-us/our-board>

⁶ The Science Council replaced the GACS in 2017 and the ACSS replaced the SSRC in 2018).

might need to change in light of progress and wider developments in particular areas; for example, the review of food allergy and intolerance in March 2017.

23. We intend to draw on the advice from the Science Council Working Group on Capability & Assurance to develop this further. Their report on capability and assurance will be discussed by the FSA Board at the December Open Board meeting. We are also funding two strategic projects to develop better ways to assess value and impact of our science and wider work:

- A major project on Value of Life Year (VOLY), co-funded with a consortium of government departments and agencies, all of whom regularly apply monetary values for life and health impacts in economic appraisal⁷ This will help establish common understanding and approaches across government; and
- A new project looking at ways to value FSA research, including externally commissioned and internal work.

24. We are also contributing to the current cross-government Science Capability Review, with all other departments. Although the focus of this review is on capability across government as a whole and opportunities to strengthen this further, we expect that our participation and the final reports will give us a sense of how we benchmark against other departments as well as insights on how other departments are addressing common challenges, which will be useful in developing our approaches.

CONCLUSION

25. The Business Committee is asked to:

- **discuss** the current, past and forecast future science spend and resource and developing priorities, in preparation for the Board's substantive discussion on the 2019/20 budget; and
- **discuss** the progress in continuing to develop FSA's science capability and our science assurance

⁷ Department for Environment, Food and Rural Affairs, Department of Health and Social Care, Department for Transport, the Food Standards Agency, Food Standards Scotland, the Health and Safety Executive, and the Home Office.

Annexe 1 Examples of science impact in 2017 and 2018

International Workshop on Hepatitis E- International Partnerships

In April 2018, the FSA led an international science and policy conference Hepatitis E, in Amsterdam. 21 countries and EFSA participated. Between 2005 and 2015 there has been an almost 10-fold increase in laboratory-confirmed cases of Hepatitis E in humans, with cases reported from 22 EU/EEA States. The most likely source is fermented sausage and pig liver, though others include products containing pigs blood and contaminated water. The workshop aimed to promote scientific co-operation, inform policy interventions and to encourage intelligence sharing. This produced a number of informal bi or multi-lateral 'in principle agreements' and the full report will be published later in 2018.

CheckIT; Trialling Technology for Remote Monitoring of Food Businesses- Regulating our Future

Three-month trial, partnered by the FSA and the Local Authority, saw five businesses around Cambridge replace their paper-based food safety management processes with CheckIT's digital solution. Daily compliance checks were recorded via wireless sensors and the results automatically uploaded to cloud storage. Through the cloud-based control centre, users can access records remotely, receive alerts on any anomalies and track performance in real-time. Such systems could help: inform the decision making of auditors, increase efficiency of food safety inspections, support businesses with regulated assurance of food safety, improve transparency between businesses and regulators, and optimise public protection.

Distributed Ledger Technology; Blockchain in Abattoirs- Regulating our Future

Industrial partnership to develop a more efficient and effective approach to the collection and communication of carcass inspection results. Benefits have been found to go beyond (significant) efficiency savings. Tracing patterns among monitored conditions e.g. prevalence of Liver Flukes, as was not previously possible, and ability to feed this information back to producers gives them an opportunity to further improve management practices. This project has developed rapidly from inception to expansion from 1 to 7 facilities. The CSA presented early results to an international regulator conference at BEIS in May and officials have further met with the Office of Product Safety and Standards as a result. The FSA is a front runner among Government Departments in the application of this technology, providing a reference point to others.

Chief Scientific Advisor's Report; The Food Hygiene Rating Scheme

This is a series of periodicals of our latest scientific efforts and thoughts. Issue 7 (Dec 2017) focussed on the FHRS. The FHRS is empowering people with the ability to make a more informed choice and driving an improvement of hygiene standards. In Wales, consumer recognition of the Scheme has continued to rise; from 43% IN 2012 TO 89% IN 2017. There, 65% of food businesses now have the highest food rating of 5; 'very good', an all-time high. NI has now followed suit with a statutory scheme, whilst that option continues to be explored in England. The CSA reports are widely respected manuscripts and offer positive public engagement in our science. The CSA Report on FHRS has received more than 850 downloads to date.

Improvement to Allergy Alerts Service- Consumer Safety

Launch of our new allergy alerts service, powered by APIs; digital commands to ensure transitions between notification, information gathering, investigation, risk assessment and the publication of alerts happen as smoothly as possible. This ensures that when the FSA is notified of an incident, often on a Friday afternoon, there is reduced opportunity for delay in the provision of consumer safety advice. These improvements have been well received; "The Anaphylaxis Campaign is delighted to be working with the FSAIn a recent survey of our members, the provision of food allergy alerts was ranked as the number one benefit of membership.....anything that can improve the timing and the efficiency of the process of delivering the alerts is welcomed."

Annexe 2 Further information on FSA spend and resources on science capacity and capability

Table 1: Breakdown of external science spend between 2013-2019

	Core		Investment		Strategic		Total Science	Of which NI	Of which Wales
	£M	% of Total Science	£M	% of Total Science	£M	% of Total Science			
2018-19 (forecast)	6.4	57%	3.3	29%	1.5	13%	11.2	1.3	0.1
2017-18	6.5	59%	4.1	37%	0.5	5%	11.1	1.2	0.1
2016-17	8.4	67%	3.5	28%	0.7	6%	12.6	1.5	0.2
2015-16	9.0	54%	6.7	40%	1.0	6%	16.6	1.7	0.8
2014-15	9.8	49%	10.5	52%	-	-	20.2	1.7	0.3
2013-14	10.3	57%	7.9	43%	-	-	18.2	1.6	0.2

Figure 1: Co-funding spend & co-funding as a proportion of total science spend between 2013-2019

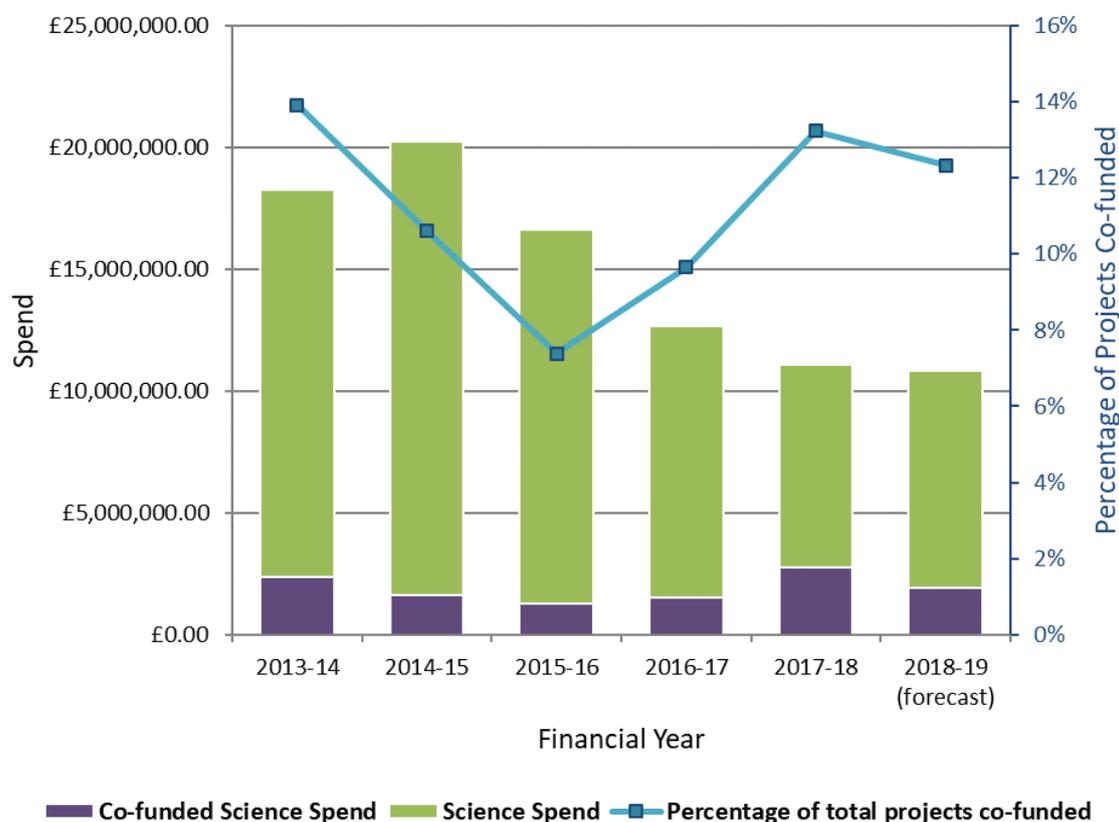


Table 2: 2017-18 spend on Scientific Advisory Committees

	Programme spend	FSA support	Total
Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT)	£27,546	£221,207	£248,753
Advisory Committee on the Microbiological Safety of Food (ACMSF)	£24,897	£127,156	£152,053
Social Science Research Committee (SSRC) and Advisory Committee for Social Science (ACSS)*	£4,839	£62,768	£67,607
Advisory Committee on Novel Foods and Processes (ACNFP)	£20,967	£36,000	£56,967
Advisory Committee on Animal Feedingstuffs (ACAF)	£18,886	£26,264	£45,150
FSA Science Council	£13,974	£130,245	£144,219
Total	£111,109	£603,640	£714,749

Programme spend refers to the cost of hosting SACs (cost of meetings, members' fees & expenses). FSA support represents FSA staff costs.

Variations in levels of FSA support between Committees generally reflect the different frequencies with which different Committees meet, and the extent to which their work requires detailed expert input from FSA staff, for example in preparation of detailed literature reviews and evidence syntheses to support risk assessment.

*The SSRC was closed in April 2018 when it was superseded by the new Advisory Committee for Social Science (ACSS).