ANNUAL SCIENCE UPDATE FROM FSA'S CHIEF SCIENTIFIC ADVISER

Report by Professor Guy Poppy, FSA Chief Scientific Adviser (CSA)

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SUMMARY

1. In my final report as the Chief Scientific Adviser (CSA) for the Food Standards Agency (FSA), I provide my outgoing perspective on the FSA's use of science in helping ensure it is a science and evidence led department, outlining the key opportunities and challenges ahead.

2. The Board is asked is asked to consider and discuss these reflections.

INTRODUCTION

3. I have now come to the end of my six-year tenure as the FSA's CSA, providing independent scientific advice and challenge to ensure we live up to our principles of being open, transparent and based on the best available scientific evidence.

4. The FSA was set up as a government department in 2000 to protect the public's health and consumer interests in relation to food, amid the Bovine Spongiform Encephalopathy (BSE) outbreak. In response to national concerns about the food system and public loss of trust, science was essential in addressing the issue itself, as well as rebuilding trust. For the last 20 years, science has remained at the centre of the FSA's work to protect public health and for people to have food that is safe and that they can trust.

5. During the current COVID-19 pandemic, science is playing a central role across government, providing a common language across departments, to help address a complex and difficult situation. Across government, CSAs work together to carefully consider options and trade-offs, based on the best available scientific evidence, as heard during the daily COVID-19 briefings. I continue to work with the CSA Network[1] across government to ensure consumer interests and the FSA's position are represented in the assessment and management of our food supply within the ongoing COVID-19 response.

[1] https://www.gov.uk/government/groups/chief-scientific-advisers

6. As the FSA CSA, such networks allow key departmental links to be developed across government, allowing siloes to be broken down in order for government departments to work together to find the best approach to a complex health crisis. In previous years, the FSA has shown great success with areas in which the UK's public interest is most effectively served, through working with other government departments to produce the best outcomes for public health.

7. Antimicrobial Resistance (AMR) provides an example of a situation with a high cost to the world economy and to human life, in a world in which we cannot rely on current treatments, in this case with antibiotics. The O'Neill report on AMR published in 2016[2], estimated that by 2050, 10 million lives a year and a cumulative 100 trillion USD of economic output are at risk due to the rise of drug resistant infections. Over the past few years, the FSA have worked closely with other government departments and expert groups to develop coordinated plans to address AMR. In spite of criticism from some quarters, the FSA persisted with their message, driven by science, that AMR could be lowered through reducing the use of antibiotics in the food system. As a result, the food industry has continued to reduce antimicrobial usage in livestock with microbials successfully lowered in the chicken, pig and beef industries. This successful reduction has required significant effort by industry and has resulted in early signs of the levels of AMR in pathogenic microorganisms in food being reduced[3].

8. In this report, I focus on three topics for the Board's consideration:

    a) The role of science in risk analysis;
    b) FSA science structures;
    c) A food "systems" approach to safe, authentic food.

RISK ANALYSIS

9. Whilst COVID-19 has been the focus of immediate national attention, the FSA continues its preparations for EU Exit. Leaving the EU means that the FSA, alongside colleagues from Food Standards Scotland[4] (FSS), will become responsible for many of the combined risk analysis functions previously carried out by the European Food Safety Authority (EFSA) and the European Commission.

[2] https://amr-review.org/sites/default/files/160525_Final%20paper_with%20cover.pdf
[3] https://www.food.gov.uk/research/foodborne-diseases/eu-harmonised-survey-of-antimicrobial-resistance-amr-on-retail-meats-pork-and-beefchicken-0
[4] https://www.foodstandards.gov.scot/

10. My final CSA Science Report will introduce the principles of the FSA risk analysis: how scientific evidence is at the core of our advice and recommendations, how the integrity of scientific evidence and its use is protected through clear separation of science (risk assessment) and policy (risk management) responsibilities, and the importance of transparent communication of our evidence and any associated scientific uncertainty to the trust consumers place in us.

11. Key to our risk assessment capability, capacity and assurance, particularly when dealing with complex issues, is our access to external expertise: our Science Advisory Committees (SACs), Joint Expert Groups (JEGs) and Register of Specialists (RoS). These independent expert committees help ensure that the FSA identifies, sources, integrates and uses the best available scientific evidence and expertise from all relevant disciplines to inform and evaluate its work.

12. The ongoing support from SACs has allowed the FSA to address and resolve complex issues that lie at the interface between multiple government departments. An excellent example this year was from the Committee on Toxicity of Chemicals in Food, Consumer Products and the Environment (COT), whose scientific work enabled FSA to publish guidance covering consumer safety advice and regulatory action around Cannabidiol (CBD) products[5].

13. Last year my Annual Science Update to the Board[6] highlighted the need for strong secretariat support and improved retention and succession planning for FSA's expert committees, as they continue to grow, which requires continuous engagement and co-ordination. Recent increases to SAC membership included, 35 additional members appointed in 2019 in preparation for EU Exit, and a further 11 appointments this year. It will be critical to maintain the high-quality of memberships to FSA's advisory committees, that will provide robustness in facing the challenges ahead, most critically in the post COVID-19 and post EU Exit landscape.

14. The clear separation of risk assessment and risk management functions in risk analysis is important, but this should not form an impermeable institutional barrier, as the process is not linear. Risk managers are responsible for advising on the options available based on the science and evidence generated by risk assessors and other analysts. However, it is important that risk assessors and others involved in the formulation of evidence packages are able to challenge

[5] https://www.food.gov.uk/safety-hygiene/cannabidiol-cbd
[6] https://www.food.gov.uk/sites/default/files/media/document/fsa-19-03-06-annual-science-update-from-fsas-csa-report-final.pdf

both the original 'problem formulation', the context for which evidence is sought, and why and how management decisions have been made if they feel evidence has not been sufficiently recognised. This dialogue ultimately benefits the FSA in being able to better respond to external challenge, and the CSA's assurance role should continue to support this as necessary in the future. Beyond risk analysis, development and delivery of an impactful science strategy and innovation requires both an intelligent provider and customer, therefore requiring close and effective working across the science and policy "divide". As we continue to respond to government priorities, such as COVID-19 and EU Exit, resilience and communication at all stages of the risk analysis process become ever more critical.

15. FSA risk analysis should not become too risk adverse in anticipation of greater scrutiny following EU Exit. The FSA should show an acceptance and willingness for reasonable challenge of its advice and recommendations, taking confidence in the strength of its science, it processes and its ability to communicate uncertainty, as a proportional and importantly, independent government department. The recent publication of our norovirus attribution study[7] that revised our estimates of the foodborne norovirus infection for 2018, from approximately 73,000 to 380,000 cases, and our consumer messaging that this does not indicate an increase in UK illness, or any new risk to public health, but rather an improvement to our scientific understanding is a positive example of taking confidence in our science, even when delivering potentially challenging consumer messages.

16. If we are to expect greater challenge on the quality of our evidence and associated advice and recommendations, then we should be clearer on what we consider to be 'quality' evidence: the demonstration and use of statistical power, experimental repeatability etc. This is particularly important when moving, or others are encouraging us to move away from a more "precautionary" position. It may remove some of the more "anecdotal" challenge we receive by clearly laying out evidence expectations.

17. Revisions to the FSA's risk analysis process and the expansion of our associated capability and capacity was led by EU Exit preparedness. I am confident in the FSA's state of 'readiness' however, this must not be mistaken or allow for complacency with respect to the challenges presented in implementing our future food safety regulatory system. At this point, the FSA has established good 'theory' on how the system will work but it will need to observe operations in earnest and at scale to fully appreciate their functionality and where further improvements may need to be made.

[7] https://www.food.gov.uk/research/foodborne-diseases/norovirus-attribution-study

FSA SCIENCE STRUCTURE

18. The proactive and transparent scientific engagement between the Board and Executive, and the openness in which the CSA is invited to participate and offer challenge and assurance provides a great amount towards demonstrating the FSA's emphasis on scientific integrity. I want to highlight the importance of such relationships and encourage that they continue in the way established, with the introduction of a new CSA and shortly, a new FSA Chair. I would like to show appreciation and recognition for the significant commitment that the FSA Chair, Heather Hancock, has made to bringing more science into Board Papers, reiterating that science and evidence lies at the heart of the FSA. It is with this support that many of the successes listed in this report can be made.

19. The development of the FSA's Science, Evidence and Research team and leadership in recent years is paying dividends to the quality of our outputs, but we continue to be challenged to do "more", more intelligently. The advice and support of the independent Science Council has been significant in this respect, and should continue to be reflected on but also, I welcome the move to bring the FSA's data & digital and science & evidence teams under one directorate. Integrating these teams is likely to bring several benefits: better recognition of our data scientists as scientists; improving the dialogue between these groups of specialists; delivering modern tools and methods to our core science functions; but also greater opportunity to share the principles of scientific rigour across all areas of work. It is important that the CSA's role in providing assurance goes beyond the science, evidence and research directorate. The role of the CSA includes how science is used and impacts can be assessed across the whole agency. There are still parts of the FSA whom think a CSA is interested only in the work of those in the science teams. However, how evidence is used by others is important, since it is worse to have world-class evidence which you don't use than to not have it in the first place. The CSA's role across the FSA is not always utilised by all directorates and should be further promoted and clarified internally moving into the future.

20. The structure and visibility of FSA science is recognised across government, with the CSA's role and science-led approach of FSA highlighted across the CSA Network and other government departments. For example, my annual CSA science updates to the Board were flagged as good practice in the recent cross-government Science Capability Review[8].

[8] https://www.gov.uk/government/publications/government-science-capability-review

21. The recent success of the FSA's Surveillance Programme[9] is a good example of FSA's 'agility' in trialling new science and innovation-led opportunities but as the programme matures, questions remain about its long-term impact assessment. This has been of interest to the Science Council's Working Group on Data Usage and Digital Technology[10], due to report to the FSA shortly. The FSA's trial and early adoption blockchain, signal prioritisation and Artificial Intelligence are all gaining additional interest during the current COVID-19 pandemic.

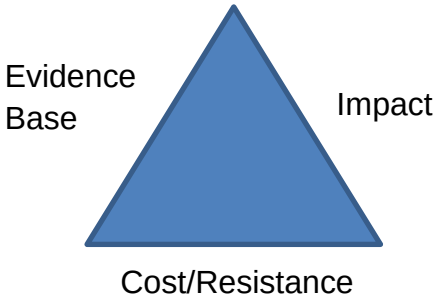
22. The Science Council have also previously advised on horizon scanning[11]. The FSA has undertaken, and continues to review, rapid-response horizon scanning activity to understand potential impacts COVID-19 could have on food safety, across different time periods. This has been effective in drawing insights from across the FSA and beyond. Such a cohesive system, interlinking our situational awareness and foresight was the aspiration of our Science Council recommendations. The experience and engagement gained in information sharing, both across the department and with stakeholders, should not be lost in 'peacetime'. As we mark the FSA's 20th anniversary, we are better placed than ever to predict and/or prevent major challenges, but COVID-19 will continue to show there is more to be done in this space, especially as we see new systems developed in the 'new normal' in future years.

23. Science is a key component of the FSA's overall strategy and we must ensure it continues to be recognised as such, closely integrated with the newly created 'Strategy Hub'. The renewal and publication of a statement of our Areas of Research Interest (ARI)[12] will also be useful as an engagement tool to articulate and engage with our science priorities. The ARI, which should be regularly updated to reflect new opportunities, will allow us to further improve internal process and articulate science priorities across all FSA Directorates. However, ARIs must also be used as a mechanism for external engagement in the future, helping identify opportunities for collaboration with other government departments, researchers and funders, that will have high impact and improve public health.

24. Our experience in evidence delivery for risk analysis is directly transferable to the assessment of FSA's 'grand' challenges and the trinity of evidence base, cost and resistance, and scale of impact within. The Chief Medical Officer, Chris Whitty, often discusses this trinity or 'triangle' in terms of public health, which

[9] https://www.food.gov.uk/sites/default/files/media/document/fsa-20-01-05-annual-surveillance-report-1.pdf
[10] https://science-council.food.gov.uk/science-council-subgroups/science-council-working-group-on-data-usage-and-digital-technology
[11] https://science-council.food.gov.uk/sites/default/files/fsascwg3finalreport.pdf
[12] https://www.gov.uk/government/collections/areas-of-research-interest

demonstrates when the sides of the triangle are equal in terms of scale of evidence base, impact and cost, it is more likely an area will move forwards. This balance is useful for FSA to recognise and consider moving into the future.



25. The Strategic Evidence Fund (SEF) was established in 2016 to support R&D and is steered by the CSA. Whilst the FSA Investment Board provides funding where there is a clear business case against current FSA activities and priorities, the SEF has been targeted towards the FSA's scientific aspirations, supporting 'blue skies' innovation and strategic partnerships. The SEF is being increasingly utilised and has secured funding for a further three-years, set to increase in value from £1.5 million to £2.1 million. I would like to recognise how fortunate we have been to have this funding and thank the Board and Executive for the opportunities this has created.

26. The success of SEF is widely recognised, with other government departments interested in our mode, trying to establish equivalents, which include setting-up fellowships/placements that facilitate similar strategic opportunities that have been so successful for FSA. For example, support of our Antimicrobial Resistance (AMR) Fellow, Dr Alison Mather, who's work investigates the foodborne transmission of AMR. One of Dr Mather's Post-docs has recently become an independent Group Leader in her own right, investigating Campylobacter in the food chain, and has been appointed as a member of our Advisory Committee on the Microbiological Safety of Food, representing additional and ongoing gains from the FSA's original investment.

27. Where SEF has helped build the capacity of science within the FSA over the last six years, challenges such as CBD and COVID-19 have highlighted we must remain a flexible and agile means to invest in science, to support future resilience, innovation and our reputation for research excellence.

28. The FSA must continue to make sure that those from a scientific background are continuously recognised, celebrated and supported in their development. This can be do through engagement with the cross-government professions

such as Government Science and Engineering Profession (GSE)[13]. Doing this will ensure we continue to attract, develop and maintain the brilliant scientific expertise we have.

29. Science is an international profession with a common approach and language, that enables collaborations and co-operation. Given the UK's leading scientific position in the world, food is a useful vehicle for us to be globally leading and connected, as is recognised by the Foreign and Commonwealth Office, whose CSA plays a useful international role in this area.

FOOD SYSTEMS APPROACH TO SAFE, AUTHENTIC FOOD AND CONSUMER'S WIDER INTERESTS IN FOOD

30. Food systems thinking is critical to the work of the FSA and we have done well to engage with those throughout the chain. Systems thinking is an ever-growing topic across government and the FSA should continue to share its learnings with other departments.

31. As a non-ministerial government department committed to protecting public health, the FSA has played and continues to play an important role across government, that ensures the safe and sustainable supply of food. This role has been particularly important during the response to COVID-19. Although the UK food system overall has responded well to the sudden shocks caused by COVID-19, it has provided an opportunity to review and consider the future of the UK food system.

32. Our existing food system has is causing significant environmental and human health costs. Primary producer's and end consumer's openness to change following COVID-19 can be used as an opportunity to evolve the current system. As efforts move to a 'new normal', we should be mindful of opportunities such as the England-based National Food Strategy (NFS)[14] led by Henry Dimbleby or UKRI's £50 million research programme to transform the UK food system[15], for which I will be taking up the role as Programme Director. Now is a critical time to not rush into replicating an existing system, but to learn from the past system, and consider the future system we need to build.

33. The current UK food system is complex, and the FSA has a role in this, to help deliver the UK's food safety and authenticity regulatory system. The NAO

[13] https://www.gov.uk/government/organisations/civil-service-government-science-engineering
[14] https://www.nationalfoodstrategy.org/
[15] https://bbsrc.ukri.org/funding/filter/transforming-the-uk-food-system-for-healthy-people-and-a-healthy-environment-call/

Report: *Ensuring Food Safety and Standards*[16], highlighted the strain these delivery partners are under and we have seen during the albeit unprecedented circumstances around COVID-19, sampling levels fall significantly. The FSA must continue to support and encourage cross-governmental appreciation of what is required to deliver a resilient national food safety system, and the significance of this for consumers.

34. The FSA is a government department and a regulator, tasked to ensure food is safe and what it says it is. In this role the FSA works with a wide range of delivery partners (e.g. Local Authorities, National Reference Laboratories and others), and can use a range of approaches/tools such as regulation, advice and/or fiscal to ensure the consumers interest is first and public health is protected. Previous views of FSA's role however, have been somewhat divided both internally and externally, with some considering the role of the FSA only as a regulator. Recent thinking is moving towards a view that the FSA can be enabled to work across roles, as a regulator and a government department that puts the consumer interest first, that works ultimately on behalf of the public, to ensure people have food that is safe and that they can trust.

CONCLUSIONS

1. In a post COVID-19 world we will face new challenges as trading patterns change, consumer trends continue to evolve, and science/technology/business models disrupt the system. In addition, we will have to work to evaluate our food system and its resilience going forward.
2. In these times of uncertainty, the FSA must not to become too risk adverse as this has allowed us to achieve influential pieces of work.
3. As we prepare for EU Exit we must continue to maintain our support for the independent scientific committees, to ensure the FSA has access to the best available scientific advice.
4. When the FSA formed 20 years ago it would have been very hard to predict some of the critical issues of today and whilst we are better placed to predict the next 20 years, especially with the ongoing horizon scanning work, there will still be surprises.
5. There is opportunity to create a new normal for food systems, in which we can review and consider the food system we want to build for the next 20 years.
6. The FSA should use its status and powers as both a government department and a regulator, putting the consumer first, ultimately to protect public health.
7. I wish the FSA and my successor, Professor Robin May, well and one thing that I know will not change is the importance of science and evidence that will always be at the heart of the FSA.

[16] https://www.nao.org.uk/report/ensuring-food-safety-and-standards/