FSA Chair’s lecture to the Institute of Food Science and Technology

FSA Chair Professor Susan Jebb delivered a lecture to the Institute of Food Science and technology on Tuesday 3 June 2025 entitled "Science on the menu: how innovation shapes regulation and keeps food safe”. A full transcript is available below.

Good evening. It's a privilege to speak with you today as Chair of the Food Standards Agency, a position I’ve held for the last four years.

This year marks a very significant milestone for the FSA – it’s our 25th anniversary. For a quarter of a century, the organisation has worked hard to ensure food is safe and authentic for everyone.

A lot has happened in 25 years. Brexit in particular fundamentally changed and expanded the role of the FSA. And now, as the government renegotiates a new SPS arrangement with the EU, we are looking towards another new way of working with the EU – our single biggest trading partner.

Over the last 5 years, we’ve also grappled with a global pandemic that fundamentally impacted our food systems; the war in Ukraine that revealed vulnerabilities in global supply chains; and each year we see the increasing impacts of climate change on food production. These are challenging times for food safety and security.

Whether in our work or personal lives, we all know how easy it is to be buffeted by external events and thrown off course. But as the regulator for food, and a scientist at heart, I’m committed to using science as our compass on that journey, guiding everything we do and helping us to navigate our way.

Today, I want to explore the interconnections between science and regulation; to look how innovation in science, both technology and data, is helping to reform our regulatory system, and how regulation itself needs to evolve with scientific innovation, for example the development of novel foods.

The FSA was established in the wake of the food scandals of the 1980s and 90s – most notably, the BSE crisis. It was a time when the public simply couldn’t take food safety for granted.

Trust was broken. Public confidence in food and those responsible for regulating the food system was at a low. The FSA was set up by the government in April 2000 with a clear mandate: to protect public health and consumers' interests in relation to food.

From the outset, science has been essential in rebuilding that trust - from our risk assessment functions, to our policy development and enforcement activities.

We've invested in research to stay ahead of emerging food safety challenges. We've collaborated with academic institutions and industry partners like yourselves. We've ensured our guidance and policies reflect the latest scientific evidence through our network of scientific committees - and thank you to those of you who sit on them. We’ve continuously built our in-house capacity to analyse and interpret complex scientific data, recruiting more than 100 new scientists to the

Agency in the last five years and growing our links with universities through joint projects and secondments. And we've made our work open and transparent, so that others can review our science and understand the basis for our decision-making.

This principle of being guided by the science – which we heard so much about during the pandemic – is part of the FSA's DNA and has been a key part of building and maintaining the trust of consumers. But as I'll come onto later, in an era of disinformation and misinformation, trust cannot be taken for granted.

But first, let's look at a few examples from our work that illustrate the interactions between science and regulation.

A big part of our job at the FSA is to manage food incidents when they occur and, of course, to prevent them whenever we can.

For a food system that feeds 68 million people a day, it's not surprising that things can, and sometimes do, go wrong. For the FSA, that means responding to more than 2,000 incidents every year. With more and more complex supply chains, the challenge to stay on top becomes a 365-day-a-year task. This was something really brought home to me over Christmas 2023 when we were dealing with an E. coli incident linked to cheese – a cheese we knew was common in Christmas gift hampers.

Fortunately, new scientific advances have the potential to boost our capabilities. Traditionally, confirming the presence of pathogens or contaminants could take days or even weeks. Today, rapid testing allows us to detect harmful bacteria, allergens, and chemical contaminants in hours or even minutes, often on-site without requiring specialist laboratory facilities.

The FSA is encouraging the adoption of these technologies and is working with the food industry to integrate them into quality assurance processes. While some technologies, such as portable DNA testing, are still in development, we're actively working towards their deployment.

We're also increasingly using Whole Genome Sequencing to identify and differentiate between different bacterial and viral strains and to explore how foodborne pathogens and antimicrobial resistant microbes move between the environment, farms and food, helping us to identify and control the source of outbreaks.

You might remember a salmonella outbreak that happened just before Easter 2022. We were the first country to detect this outbreak, and we led the global effort building on the UK's capability in Whole Genome Sequencing, where there has been cross government-investment, not least during the pandemic.

Whole Genome Sequencing is a powerful tool to detect genetically related pathogens, that helped us to link the first five cases to each other, mostly in children. But without epidemiology and food chain analysis, it's not possible to identify the outbreak source. It was the UK's joint assessment that pulled all these strands together.

We found the common foods they had eaten were chicken and chocolate. It would have been easy to spend a lot of time pursuing the chicken, but WGS enabled us to precisely link the cases to Kinder eggs and other chocolate products manufactured at a specific site in Belgium. This prompted a product recall across the UK and 98 other countries globally, and prevented children, mostly under five, from getting ill – and over Easter. All food businesses know that incidents mostly seem to happen on Fridays, and I'm fairly sure that most big ones happen over the holidays!

In another recent incident, we identified mustard ingredients that had been contaminated with peanuts. This is obviously a huge risk for people with food allergies. Food-induced anaphylaxis

causes up to ten deaths each year in the UK and peanuts are one of the riskiest allergens.

Here we were able to prevent tragedies occurring because of improvements in the sensitivity of the analytical methodologies. Levels of peanut allergen that were below the limit of detection two years ago, were by autumn of last year not only detectable, but quantifiable. This was directly attributable to the enhanced sensitivity of ISO accredited methods, meaning we could detect serious hazards earlier than ever before.

This case, and many other before it – you may remember the Sudan Red incident in 2005 – means it's vital that we have good traceability systems, and that food businesses know their supply chains. In the mustard incident, people with peanut allergies were frustrated why we had to issue a blanket notice about all foods containing mustard powder, but it took time while we tracked down the exact supply chains. Meanwhile, we had to take more widespread action that we would have wished to provide high levels of protection for people with a peanut allergy.

This is where advances in data science and blockchain technology can help and businesses need to be investing in this kind of science and technology to uphold their responsibilities to consumers to ensure food is safe and properly labelled.

In the mustard incident, we acted swiftly to reduce an immediate risk, but through our proactive research programmes we want to identify risks at a much earlier stage too.

The FSA-led PATH-SAFE programme worked across government and academia with the aim of helping us to better detect and identify harmful pathogens. With more than 65 partners, we've been able to develop innovative new methods and models such as new multiplex qPCR panels for gastrointestinal viral targets, isolate clustering methods to speed up isolate comparison, PCR tiling in wastewater surveillance and source attribution models.

We've identified and filled crucial knowledge gaps about antimicrobial resistance and foodborne pathogens across the agricultural and food system, including from abattoirs, milk production sites, livestock feed, aquatic environments, shellfish, hospitals and care homes.

PATH-SAFE has also boosted bio-surveillance capabilities including a National Genomic Data Platform, with analytical capabilities to support genomic analysis of three foodborne pathogens (Salmonella, E. coli and Listeria) and associated AMR. It allows partners to easily share and compare genome data from foodborne pathogens to accurately trace foodborne disease outbreaks to their source.

We've led this cross-government investment that has brought partners together from human and animal health, food safety and environmental science, to deliver a genuine 'one health' approach and I want to thank everyone who has contributed to the success of this project. This kind of joined up multidisciplinary science is the only effective way to tackle foodborne illness in the long-term, when most of the causal pathogens originate in animals and spread to humans via food and the environment.

Some risks are global, but others are much more local. Our FSA social science research programme has sought to identify some of the risks in our own homes. For example, we've looked at whether and how people prepare and sterilise infant formula bottles.

This is important, because if it's not prepared properly, powdered infant formula can contain harmful bacteria; in fact, it's the most common cause of Cronobacter infection in infants. We found that carers are not always washing their hands or cleaning and disinfecting bottle preparation surfaces. But perhaps even more concerning is that formula preparation machines did not consistently produce water at the minimum temperature required to kill harmful bacteria. This work led to updated guidance by the NHS and warnings to the public through organisations such as Which? and parenting charities.

To find out more about what really happens at home, rather than what people tell us they do, the FSA Kitchen Life project installed motion-sensitive cameras in seventy household kitchens. We also captured data using food diaries, shopping receipts, photographs of fridges, and surveys and interviews, as well as installing a fridge-freezer thermometer to build up a comprehensive picture of people's food safety behaviour. I think there's probably enough footage for a TV box set!

I want to thank all those people who took part in this research because it has helped us to understand where we still need to do more to reduce the common risky behaviours such as washing chicken, but also to identify other behaviours that we have not previously focused on.

If it's happening among people who kindly and willingly allowed us into their kitchens, I'm pretty sure it's happening more widely too. That includes things like the reuse of tea-towels and cloths, for extended periods or for a variety of tasks.

We also saw lots of chopping boards being left around the kitchen or not washed adequately. And we saw fridges at far too high a temperature and a lack of understanding about what the right temperature might be.

And through our research we learn about things we might not expect. At the height of an outbreak of Salmonella linked to imported poultry, we conducted a rapid survey of consumer behaviour. Through this, we learned that some people were cooking chicken burgers in toasters and minimally cooking chicken nuggets, assuming they were done simply because they looked the colour of cooked chicken at their core. And I worry about these kinds of behaviours when we know that people are struggling with the cost of living and looking to cut their energy bills by taking short-cuts in food preparation.

I want now to move on to talk about data and how it underpins effective regulation. That's not a new idea, but over the years we've tried to use data in new ways.

Back in 2005, the FSA launched the first UK salt campaign – do you remember Sid the Slug? That was the consumer-facing component, but far more important was the use of data to shape business behaviour.

We used information on the salt content of foods to set targets and then monitored sales and the composition of products over time to assess whether the targets were being met. This process – target-setting, monitoring and reporting on progress – was enough to drive significant reformulation, and in the first five years led to a 10% decrease in salt intake.

This work was later taken up by the Department of Health and extended to sugar and calories. More recently the Department of Health, Defra and the FSA have been working together with industry as part of the Food Data Transparency Partnership to explore how data can be used to improve the environmental sustainability and healthiness of food and drink through better food data.

I was interested to see the open letter to Government from the food industry last week calling for mandatory reporting to help drive healthier sales and I hope this is something that will be considered as part of the government food strategy.

Access to data gives us insights to the increasingly complex global food system, where products and ingredients cross multiple borders before reaching our plates. But we need to be sure of the quality of that data, we need to know who owns it and whether we can trust it – and that's where AI is helping us.

We developed the Signal Prioritisation Dashboard to provide us with that early warning of emerging risks. It's a horizon-scanning application that sits at the heart of the FSA's strategic surveillance programme. It uses advanced AI tools to analyse, categorise and translate data from

dozens of open sources each day, consolidating signals related to food, feed and food contact materials into a single access point.

The benefits have been substantial. The dashboard has given us a much clearer picture of food safety issues affecting the UK. We have greater transparency and control over data sources, and we've minimised reliance on third-party systems, resulting in significant annual savings.

What's more, we sometimes detect signals ahead of other systems, giving our analysts and intervention teams invaluable lead time.

Since 2013, the dashboard has proved its worth during major events including Brexit and COVID-19. We've now accumulated more than 77,000 records, creating a rich dataset for trend analysis.

The system is regularly accessed by more than 125 users across our organisation and our colleagues in Food Standards Scotland. We're thinking about how we can expand access to others in the food system, because keeping food safe is primarily the responsibility of business – and we want to help them get it right.

Data is also giving us an opportunity to create a more intelligence-led approach to sampling to check that food is what it says it is. Working closely with local authorities and delivery partners, we've developed a new model that combines traditional sampling methods with new data streams, including our signals dashboard and sampling results to build a more nuanced picture of risk.

We can then issue targeted priorities to local authorities for sampling to enable valuable public resources to be invested at points of greatest risk. For example, our latest priorities tackle issues such as banned additives in soft drinks that are often imported illegally.

But we know there's more we can do. We're now working to harness the vast amounts of data held by the largest businesses in the food sector, starting with retailers, to improve the way we regulate food hygiene standards.

Traditionally, our regulatory system for food hygiene has treated each premises as a separate business, with large retail chains having their stores inspected by hundreds of different local authorities. We are currently considering a system we call National Level Regulation. This uses a data-driven model to combine all the valuable data that these businesses and third-party auditors already collect.

For the first time, the FSA can see this data on a monthly basis, to make a business-level assessment of overall food safety systems across multiple sites of a single business. We can then work with environmental health professionals to verify the data through local checks.

We piloted this approach in a trial running alongside the traditional inspection model. The results were very encouraging. We gained access to data from more than 10,000 audits, compared with approximately 1,500 local authority inspections typically carried out. This allowed us to observe performance trends and themes across all participating retailers' stores and identify new opportunities for improvements in food safety systems that might not be apparent from inspecting individual premises, raising the potential to spot issues quicker.

However, while many welcomed the results of our trial, we did encounter some concerns from local authorities and environmental health professionals about data reliability, and the potential risk to consumers from less frequent in-person inspections. We're working hard with these stakeholders to optimise the plan and to build a system which maintains confidence in food standards.

These very legitimate sensitivities about the reliance on data are even more pronounced with the use of artificial intelligence across the food system. We need to be alive to the risks, and each new use needs to be carefully evaluated. But we need to embrace new technologies where they can improve the way we regulate. I'm excited, for example, by the use of new software to help us undertake some audit activities in meat plants remotely. In time, with the further development of technology, including robotics and AI, we could see a reduction in the need for physical inspection presence in abattoirs.

We're not the experts here, so I'm keen that we hear from scientists working across the food system. Please, come and talk to us about the latest developments in technology and data analytics in your lab or your business, so we can harness our collective skills in science and in regulation to build a regulatory framework that's fit for the future.

I'm a scientist, you are scientists – and sometimes, I think we can let our enthusiasm for innovation run ahead of public opinion, or find ourselves working on topics which are not considered the most important by the public we serve. In the FSA, with our statutory responsibility to uphold the interests of consumers in food, it's especially important that we listen to and embrace the full spectrum of views across society.

To that end, we conduct regular surveys to monitor public opinion and to find out what matters to them in relation to their food. A key piece of research for us is our Food and You 2 survey, which we carry out biannually.

It will be no surprise to hear that the cost of food has become the most significant concern. In March, seven in ten people raised food prices as an issue and in recent years, we've provided data to government on the increasing use of foodbanks to inform work to tackle food insecurity. In our March report, other common concerns were food waste, the amount of sugar in food, and the amount of food packaging.

Quite rightly, people care about what they eat, so we should not be surprised that people are cautious about new processes and food products. At the same time, people are increasingly concerned about their health and the environment. What we eat is the single most important modifiable risk factor for ill health and food production contributes to environmental harms, so we need to engage more, and better, to explain how new technologies can help address these concerns.

In the FSA we do bespoke research on specific topics, using established methods such as deliberative dialogues to go beyond the headlines and really explore the underlying concerns or motivations to change, and to help shape our work.

We've done this in relation to gene-editing, or precision breeding, and so far, at least, we seem to be taking the public with us. Our consumer research told us that people can see that these products offer potential benefits, but they're cautious about potential risks. They look to the FSA to provide assurance that these novel foods are indeed safe.

As many of you may know, the Precision Breeding Act has now removed precision bred organisms from the legal definition of genetically modified organisms in England. This has allowed the FSA to create a proportionate regulatory framework for PBOs, develop an inspection and enforcement regime to support it, and in due course, we will make recommendations to Ministers for the approval of products.

To do that, we are reliant on the knowledge and wisdom of our independent scientific committees and our own in-house scientists. Together, we can assess the risks so that if and when foods produced through precision breeding appear on the shelves, the public don't need to worry, because the FSA and its scientific committees have done this for them. Consumers will be able to have a high level of confidence that those products are no less safe than similar conventionally

bred products. We will also set up a searchable public register of all PBOs that have been authorised for use in food and feed to provide people with information they can trust.

Looking ahead to other novel foods, we've established an Innovation hub within the FSA, focused on foods that have the potential to offer environmental or health benefits. We've launched a pioneering programme for Cell Cultivated Products, like lab grown meat. These are complex and novel products that require careful safety evaluations before they can be put on the market.

We're working with academics and industry scientists to understand more about these technologies to ensure our regulatory processes are fit for purpose and support safe innovation. In this way, we can enable UK food science and innovation to bring new products to market and deliver benefits to the UK economy.

As part of this work, we're also talking to the public about what they expect and what they need to know, so that if these products are authorised, consumers will be able to make informed decisions about their food choices.

However, it isn't enough to explain and discuss what we're doing and why. We also have to counter distrust in science, and in many of our institutional structures, and unfortunately, the rise of misinformation. Many of you will have heard the recent scare around Bovaer, a feed additive that's been developed to reduce methane emissions from dairy cows.

Misinformation and conspiracy theories about Bovaer spread very quickly online, suggesting it was a risk to consumers. Like every other additive, Bovaer has gone through the FSA's rigorous safety assessment process, and those of many other countries. These have all concluded that milk and meat from cows given Bovaer are safe to consume – the additive itself is metabolised by the cows and doesn't pass into their products. The story became about the potential perceived risk and not about the benefits of methane reduction, undermining public confidence in a new feed additive.

It's a timely warning that as food production becomes more technologically advanced, it's ever more important to bring the public with us.

In the FSA, we take that responsibility seriously and I am pleased to say that 25 years on from the creation of the FSA, safe food is largely taken for granted by consumers. But this remarkable shift from the crisis of confidence in the 1990s didn't happen by chance – it's the result of enormous and ongoing effort by everyone working in the food system, including many of you in this room today. Food safety is not good luck, it's good management.

But expectations have evolved. Today, the public expect much more from the food system and therefore from the FSA – they see standards as much broader than our safety remit. So, as we look to the next 25 years, we're asking ourselves: what role should the FSA play?

I see an opportunity to use regulation to create guardrails in other parts of the food system, helping it to deliver on the broader issues that matter to society – from health and nutrition to sustainability and food security. These are trickier matters than food safety. The science is still emerging, and opinions vary. We all want food that's safe, but when it comes to longer-term health or environmental issues, there are vested interests and trade-offs will need to be made. That's where I think an evidence-based regulator can help.

For me personally, and for the FSA, science is our compass – we need to draw on clinical research, on natural sciences, engineering, behavioural and social sciences to guide our decision-making. This will help us to ensure that food is safe, what it says it is, and that consumers can have confidence that the food they eat is becoming healthier and more sustainable.

Thank you for your time today and to the IFST for inviting me to speak. As the FSA celebrates 25 years of protecting consumers, I know that our work is underpinned by the collaborative efforts of everyone in the food system.

So, tonight I want to thank you all individually – and the IFST, too – for your ongoing commitment to food science and technology. I look forward to our continued collaboration in the years to come.

Thank you.