Foodborne Disease - Update

FSA 26/03/07 - Report by Rebecca Sudworth

1. Summary

1.1. FSA monitors foodborne disease (FBD) levels using four foodborne pathogens (footnote 1). In June 2025, official data published by UK Health Security Agency (UKHSA)/Public Health Bodies for 2024 confirmed FSA threshold levels for Campylobacter and Salmonella had been exceeded. The Board was informed of the threshold breaches at their next meeting in (September 2025).

1.2. As agreed with the Board in March 2025, when thresholds for key pathogens are breached, the Executive initiates an investigation into possible causes for the increases.

1.3. This paper sets out the evidence gathering plan and initial findings from the investigation to date, along with next steps. The Board is asked to:

- **Note** the research and evidence gathering
- **Comment** on our overall approach for investigating increases

2. Introduction

2.1. The FSA monitors levels of FBD to determine whether existing controls are working and to identify appropriate actions and interventions to react when necessary. Controlling FBD is a strategic priority to protect consumers, and this work will both develop the evidence base and interventions to mitigate against risks associated with FBD.

2.2. The investigation into the breaches found for Campylobacter and Salmonella was initiated last year. This paper sets out the evidence streams that will underpin decisions on current and future risk management actions.

2.3. Campylobacter represents a much bigger disease burden than Salmonella. It is estimated that there are 300,000 cases of foodborne Campylobacter a year with an estimated societal and economic cost burden of £716M, compared to 32,000 foodborne Salmonella cases with an estimated burden of £212M. We have therefore historically prioritised research on Campylobacter, and this is also reflected in our current research plans.

2.4. However, Salmonella remains a high-ranking pathogen in terms of public concern and outbreak prevalence. Trends have been relatively stable since 2010 following major reductions achieved in the early 2000s due to national control plans in poultry and the introduction of holistic controls across the food chain.

2.5. The annual increases observed in campylobacteriosis and salmonellosis in UK data are similar to those seen in some, but not all, EU countries. according to official 2024 figures published in December 2025 (footnote 2). Rates of salmonellosis observed in the UK in 2024 per 100,000 population are within the range seen in other EU countries, although rates of campylobacteriosis appear higher in the UK than most. Differences in rates reported between countries may in part be due to differences in surveillance and healthcare-seeking behaviour, as well as real differences in rates.

2.6. Following the confirmation of threshold breaches, FSA immediately initiated investigations. As part of this, we engaged with expertise across government including:

- an extraordinary meeting of the Epidemiology of Foodborne Infections Group (EFIG) (Annex 3 of FSA 25-03-05) to identify potential causes of the rise in cases. EFIG concluded that the increases are likely to be due to multiple, interdependent drivers but at this point the contribution from each cause remains uncertain;

- the Advisory Committee on Social Science (ACSS) was asked to consider the impact of consumer behaviours; and

- we combined this with ongoing Science Council work to consider why FBD was not reducing (commissioned by the FSA Board in late 2024), which produced recommendations for new work areas and how the work programme should be managed.

2.7. The outputs from these expert discussions and existing workstreams are summarised below and are being used to identify priorities for further investigation, shape the future direction of our FBD reduction programme and help identify interventions that might reduce levels of foodborne disease.

3. Hypothesis generation and testing

Epidemiology of Foodborne Infections Group (EFIG)

3.1. The extraordinary EFIG meeting held in August 2025 discussed potential causes behind the increases in both Campylobacter and Salmonella. EFIG prepared a detailed report for the FSA which has been summarised in Annex 1.

3.2. EFIG discussed the multifactorial nature of the increases and concluded that no single hypothesis is fully able to account for the observed trends. Potential contributing factors identified include

- the expanded use of PCR testing, which may have enhanced case detection;

- increased imports (non-UK produced) of fresh poultry, potentially introducing higher risk products;

- evolving consumer behaviours, such as food handling practices and rising pet ownership;

- travel-related exposures, particularly for Salmonella, and

- seasonal influences exacerbated by climate change were also considered significant.

3.3. EFIG also highlighted critical data gaps. These were in areas such as surveillance coverage, genomic sequencing, consumer behaviour insights, and environmental monitoring. We are using the EFIG conclusions to help us strengthen and commission new evidence and identify priorities for further analysis.

Campylobacter

3.4. As part of our FBD control work programme, the FSA commissioned work (externally and delivered work internally) to better understand why human Campylobacter cases had not decreased following the reduction of contamination levels in whole birds and the impact of Campylobacter interventions introduced across the food-chain. The output of the first phase of this work (an expert elicitation exercise published 2024) identified eight hypotheses for further investigation. Analysis on six of these has begun - see below. We are considering how best to analyse the remaining two, which relate to how representative sampling is of consumer risk (e.g. samples taken from whole fresh chickens may not reflect the risk from processed frozen chicken products such as nuggets, or samples may be taken by retailers following different protocols).

3.5. The hypotheses identified by the group are:

3.6. **Imported (non-UK) poultry meat exposure has increased (footnote 3):** Imports of fresh poultry pieces have increased since the pandemic (footnote 4). There has also been an increase in imports of eggs. While this does not necessarily represent an increased risk, there have been a number of incidents over recent years linked to imported products. Planned surveillance and understanding developments in supply chains and collation of international data may help us understand the impact of poultry imports on FBD in the UK.

- **Lower contamination levels still pose risk**: Low doses of Campylobacter can still be infectious and may account for a greater proportion of infections than previously thought. We have commissioned a new 12-month sampling project, starting in January 2026, to sample chicken at retail (footnote 5) to ensure that data on both whole birds and portions are captured, as well as frozen, UK-produced and imported poultry meat. Surveillance and data from industry indicate that reductions in the proportion of carcases contaminated with Campylobacter at both the medium (>100 CFU/g) and high (>1000/CFU) levels have been sustained, neither has returned to originally observed higher levels. This suggests that a reversion to these higher levels of contamination is not the driver

- **Changes in testing or surveillance for FBD:** We are working closely with UKHSA who are considering the impacts of changes to testing and surveillance on FBD figures. A high-level examination of the trends indicates that changes in testing do not account fully for the breaches in threshold, and this is unlikely to be the cause of the increase in Salmonella. This view has also been reflected in the EFIG discussions.

- **Other exposure routes have increased:** UKHSA are using whole genome sequencing (WGS) to identify and expand analysis of infection strains. Analysis of WGS data may identify whether infections are associated with different sources e.g. international travel rather than food consumed in the UK. Similarly, further analysis of Salmonella data might also help us identify strains more commonly associated with different food sources.

- **Slaughter and processing controls may have worsened**: A project gathering data from slaughterhouses (England and Wales only) to validate sampling results reported by businesses began in January 2026. We will engage with the poultry industry to understand the controls and interventions they are applying and the latest trends in their monitoring data.

- **Consumer behaviour and kitchen hygiene may have changed:** The rises in cases of Campylobacter and Salmonella and links to consumer behaviours were discussed at Advisory Committee for Social Science (ACSS). Outputs from these discussions are helping to direct a secondary analysis of Food and You 2 data and other consumer research to identify changes in consumer food safety behaviours. This is expected to be published in Spring 2026.

Infectious Intestinal Disease

3.7. The FSA commissioned the third study of Infectious Intestinal Disease in the UK ("IID3") to determine the overall incidence of IID in the UK population, establish the incidence of IID presenting to primary care, clarify the proportion of IID that is UK-acquired, update our description of the pathogens causing IID, and assess levels of antimicrobial resistance (AMR). It will compare results with the previous IID1 and IID2 studies, to assess changes over time and whether reporting rates have changed which could contribute to the increased numbers of laboratory reports. The final report is expected in November 2026.

3.8. To turn the IID3 figures into estimates of FBD, we additionally need to ascertain what percentage of each illness is attributable to food. In parallel to IID3, we will be undertaking an expert elicitation exercise, supplemented with available surveillance data, to estimate the proportion of illnesses attributed to food for each pathogen. It will also involve estimates of the proportion of food attributable illnesses due to each of the main food groups. In October 2025, the Advisory Committee on the Microbiological Safety of Food (ACMSF) provided views on this proposed approach. Together with the results of IID3, this will be used to update our FBD estimations models which estimate FBD by pathogens overall (should be completed by early 2027).

3.9. As described in the recent Science paper to the Board, 'understanding foodborne disease' is a research priority across the next three years. This will allow us to focus further on addressing knowledge gaps related to FBD thresholds, beyond the ongoing work in this financial year.

Further Research

3.10. As part of our annual Research and Evidence Programme (REP) cycle, future research project proposals for 26/27 and beyond have been submitted and the first stage review of 17 new FBD and AMR project ideas was completed by November. The FBD portfolio contains a strong focus on Salmonella and Campylobacter, and projects which could answer questions related to thresholds. In total, two thirds of the proposed FBD research £2M portfolio links to these two pathogens. Topic areas covered include:

a) Source attribution: projects using Salmonella WGS to human illness to pathogens from food and environmental sources.

b) Import surveillance: a 3-year programme specifically targeting imported (non-UK) meat and animal products identified as potential sources of infection.

c) Risk reduction: studies to identify interventions to reduce Campylobacter incidence including a comparison of international approaches.

d) Reservoirs of infection: further cross-government research on the incidence of Salmonella and other pathogens in raw pet food, as a potential source of human infections.

e) Better use of data: utilisation of the national genomic data platform developed during PATH-SAFE to facilitate the rapid identification of pathogen strains of interest and support the elucidation of transmission pathways, providing actionable intelligence that can be used as part of proactive and reactive pathogen surveillance.

3.11. FSA implemented the national Food Surveillance Programme in April FY25/26 which will continue over the next three years. The programme aims to deliver evolving infrastructure, knowledge and deployable surveillance assets and will join-up existing surveillance activities focused on pathogens ('bio-surveillance') and those on food contaminants and standards. It contains four pillars which are Sampling, Methods, Laboratories and Enabling Infrastructure. Deep dives into current sampling strategies (including how we engage industry in sampling and data sharing) and laboratory models will be undertaken in 2026.

3.12. We have begun a more detailed analysis comparing the changes seen in the UK to those seen in countries with similar monitoring and reporting requirements and this will be completed by the end of 2026.

4. External assurance

4.1. The Science Council (SC) was asked to consider 'why foodborne infections were not reducing' by the FSA Board in 2024. The SC has recommended (Annex 2) FSA establishes a co-ordination and governance framework for the FBD programme; identifies comparator countries with lower rates of infection to draw lessons; and reviews food threshold levels for Campylobacter used in other developed nations, particularly in Europe. The Executive accepted the SC recommendations and are working closely with SC and the ACMSF Chair to implement these.

4.2. The EFIG report was discussed at the ACMSF meeting in October 2025. ACMSF members broadly agreed with the conclusions of the report but raised concerns about the effectiveness of current protocols for obtaining travel history and thereby understanding the proportion of cases acquired overseas. The importance of behavioural studies and a better understanding of attribution was also highlighted. These points will be given consideration in designing future research and sampling plans.

5. Intervention review

5.1. The FSA recently completed a series of major reviews of evidence on the effectiveness of potential interventions at reducing Campylobacter. This included reviews of interventions at the farm, slaughterhouse, processing, retail, and consumer stages, alongside a survey of Food Business Operator (FBO) opinions about the efficacy of interventions that they have tried. Key conclusions included the identification of farms as an opportunity for preventing or slowing infection of chickens, the need for consistent controls to mitigate cross-contamination within slaughterhouses, and the importance of repeated messaging for those involved in food preparation. The final reports will be published before August 2026. A stakeholder engagement plan is being developed to share findings from this research and discuss how these can be used to refine risk reduction strategies.

6. Next steps

6.1. **Retailer reporting**: We will be increasing our direct engagement with retailers and the poultry sector with a view to exchanging information on the effectiveness of controls applied in slaughterhouse including outputs from FSA research.

6.2. EFIG recommended the FSA explore ways to resume the monitoring of contamination at retail, such as asking UK retailers to resume quarterly reporting of Campylobacter contamination levels. The FSA has been considering whether there are more effective ways of monitoring Campylobacter levels at retail. We have been engaging with industry on this and would like to better understand the controls they are applying and data they are collecting. This will include whether there are more effective ways of accessing data from slaughterhouses, for example, through sampling and testing carried out at slaughterhouse to demonstrate compliance with the Campylobacter Process Hygiene Criteria included in legislation (footnote 6).

6.3. **Exploring previously unidentified analytics opportunities**: The delivery of the new Incident Case Management System (PRISM) should give the FSA an opportunity to explore previously uncaptured and unreported FBD data to assess trends in real time scenarios and develop prevention strategies. This identified several areas which bear further investigation, including suggesting improved approaches to the analysis of officially reported cases of Salmonella to better understand possible reasons for the rise in cases.

6.4. **Governance framework:** We are establishing a new cross-department Steering Group, as recommended by the Science Council, to co-ordinate and provide oversight of the FSA's multi-activity FBD programme. We are inviting government partners with an interest in FBD, such as the UK Health authorities, Food Standards Scotland, Science Council and ACMSF, to join this Group. The existing operational governance framework is also being strengthened to support the Steering Group and delivery across the FBD programme.

6.5. **Interventions:** In parallel with the ongoing research, we are analysing the hypotheses identified to date and are considering what possible actions can be taken to mitigate/reduce the risks identified. The hypotheses cover multiple areas within the FSA's remit, and we have set up an internal strategic oversight group to help deliver this.

7. Conclusions and timelines

7.1. There are multiple hypotheses for the increases in cases of Campylobacter and Salmonella but, at this stage, potential causes are uncertain. EFIG and the expert elicitation exercise on Campylobacter concluded that the increases are likely to be due to multiple, inter-dependent drivers. Understanding the drivers for FBD in the UK is complex and needs good collaborative working across industry and government. Delivering this priority area needs stronger strategic oversight and coordination.

7.2. We are simultaneously analysing the hypotheses identified to date and are considering what possible actions can be taken to mitigate/reduce the risks identified. This will enable us to take the best actions to try and reduce the levels of FBD. The findings from other research and surveillance will be analysed as they are completed to identify potential interventions, a report with an action plan will be presented to the Board at the next annual FBD update in March 2027.

7.3. The Board is asked to:

- **Note** the research and evidence gathering plan
- **Comment** on our overall approach for investigating increases

Annex 1 – Summary of EFIG discussions on the 2024 increase in laboratory-confirmed human cases of Campylobacter and Salmonella in England

The extraordinary meeting of the Epidemiology of Foodborne Infections Group (EFIG) on 5 August 2025 was convened following the publication of the UKHSA 2024 annual reports for Campylobacter and Salmonella, which identified a 17.1% rise in laboratory-confirmed human cases in England. This increase exceeded the thresholds set by the FSA and triggered an investigation. The group reviewed available evidence, assessed multiple hypotheses, and identified significant data gaps that would benefit from coordinated action across government.

Evidence suggests the rise is multifactorial, with no single explanatory driver. Hypothesis discussed included:

- Increased adoption of expanded multiplex PCR panels for the detection of gastrointestinal pathogens has contributed to higher case ascertainment, particularly for Campylobacter, but cannot fully account for 2024 trends.

- Fresh poultry imports have increased from certain countries, and imports from those countries are associated with contamination incidents and human case clusters, making them a plausible contributor, though attribution requires further whole genome sequencing (WGS) analysis.

- Consumer behaviour Given reported reductions in contamination at retail, behavioural factors such as poor domestic food handling, cross-contamination, and seasonal cooking practices (e.g., barbecuing) may be contributing to the rise as well.

- Increased market for and handling of raw pet foods may present further zoonotic pathways.

- International travel may contribute to the rise in Salmonella cases, with approximately 27% of Salmonella cases travel-associated, particularly to Turkey and Spain.

- Indirect aspects of climate change may also play a role for Campylobacter, with an extended summer peak in 2024 coinciding with mild and wet winter weather.

GB livestock Salmonella trends were also examined as part of the evidence review. Current surveillance indicates no notable increases or unusual patterns that would support changing livestock trends as a contributing explanatory factor.

Across all hypotheses, the group highlighted critical surveillance and evidence gaps, including limited WGS coverage (especially for Campylobacter), lack of standardised data on travel history, insufficient behavioural data, and reduced retailer sharing of contamination metrics since 2023.

Suggestions for future work to consider included continuing a review of Campylobacter interventions (footnote 7)[7], exploring ways to resume the monitoring of contamination at retail, work to understand the risk represented by imported poultry using technologies such as WGS, and cross-agency work to better understand the role of travel-associated cases.

Council to facilitate the Science Council assurance role.

Annex 2 – Science Council Recommendations

Context

The FSA Board, at its strategic retreat in 2024, asked that the Science Council consider “why foodborne infections were not reducing”. This work was initially intended to cover Campylobacter and Salmonella, the two most common bacterial pathogens, but was subsequently focused on Campylobacter to enable delivery of advice in a manageable timeframe and as some of the general advice would likely be transferrable to other pathogens.

Proposed Elements of the Work Programme

To identify appropriate comparator countries, with a view to identifying lower incidence of campylobacter foodborne infection rates and associated lessons. This will be done either in-house or commissioned (route remains to be determined).

The ACMSF to review the food threshold levels for campylobacter adopted by other developed countries, especially European countries, and any range related to trade (WTO).

Proposal from the Science Council

Determining causes for increases in bacterial FBD and identifying potential mitigations requires a co-ordinated programmatic approach. This would be best delivered through establishment by FSA of a programme board/co-ordination group, led by FSA Policy, with appropriate broad representation across science, Scientific Advisory Committees (SACs) and Science Council. The above tasks can be performed by FSA in-house and/or appropriate SACs. There remains an opportunity for the Science Council to provide an overall assurance role to the required program of work, bringing fresh perspectives about the current risk landscape, proposed responses and potential future interventions. Professor Borriello would provide the link between the FSA led Programme Board/Co-ordination Group and Science

1. Campylobacter, Salmonella (non-typhoidal), Shiga toxin-producing E. coli (STEC) O157, and Listeria monocytogenes are the four key pathogens that the FSA monitors as part of routine surveillance as most cases of illness associated with these pathogens are food related, and they are either responsible for a high number of cases or are likely to cause more severe symptoms.

2. https://efsa.onlinelibrary.wiley.com/doi/10.2903/j.efsa.2025.9759

3. This also includes EU arrivals into NI ports.

4. Taken from HMRC UK Trade Information https://www.uktradeinfo.com/trade-data/. Data extracted for poultry was 7/8/25 while for eggs, it was 6/11/25.

5. https://science.food.gov.uk/post/3576-launch-of-a-new-survey-e-coli-campylobacter-salmonella-and-antimicrobial-resistant-amr-bacteria-in-raw-frozen-chicken-meat-on-retail-sale-in-the

6. https://www.legislation.gov.uk/eur/2005/2073/annex/I/chapter/2

7. This work has now been completed; see section 5.1