Údarás Sábháilteachta Bia na hÉireann
Food Safety Authority of Ireland

2025

Research Needs 2025

Project Priorities

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Project priorities 2025

The Food Safety Authority of Ireland (FSAI) has a mandate to enforce food law and protect consumer health in relation to food marketed and produced in Ireland. Its brief covers food safety, hygiene, and aspects of nutrition. Food safety research is essential to address any gaps in food safety knowledge, to support improvement of, and compliance with, food safety regulations and to identify emerging issues and threats to the food system in Ireland.

The FSAI is not a research funding body and therefore it is essential that it communicates areas of priority food safety research to state bodies that fund research and also, to scientists in research institutes who are applying for funding. These areas can be incorporated into research calls by funding bodies, or they can be the subject of researcher-led funding proposals submitted to research funding bodies.

This document outlines priority research areas that would advance the risk assessment and risk management work of the FSAI and support the protection of public health. They are listed under broad topic headings, and they include suggestions for major research projects as well as smaller desk top research studies. Relevant work in the field of study that has been brought to the FSAI's attention is listed to help researchers, but it is not a comprehensive list of relevant studies and researchers are advised to research the state-of-the-art in any particular area.

Research funding bodies and/or researchers are invited to cite this report as supporting documentation for their calls or proposals. FSAI cannot provide letters of support for individual project proposals.

The FSAI would be happy to discuss the detail of proposed research topics with researchers who wish to make applications to research funding bodies in these areas of interest. The FSAI would also be happy to contribute research ideas to research funding organisations making research calls.

Where national projects are underway or are planned in these research areas and are not listed, the FSAI would be grateful if researchers and/or research funding bodies could notify the Authority via the FSAI Advice Line (info@fsai.ie).

Project list

Exposure assessment

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
Estimation of foodborne illness in Ireland	Pathogenic bacteria cause gastrointestinal disease and a range of secondary sequalae impacting the health of people in Ireland. Data on notifiable infectious disease in Ireland is collected and collated by the HSE Health Protection Surveillance Centre (HPSC). These data contain reported illness in humans and include infections from pathogens associated with foodborne illness. However, these illnesses are not exclusively due to ingestion of pathogens from foodborne sources and neither do they capture the true level of disease in the community since many people self-medicate and do not attend medical facilities to report illness. The safety of food in Ireland is considered to be high but no definitive estimates of the number of illnesses caused by different foodborne pathogens exist. Such data would facilitate prioritisation of resources to tackle food safety via a one health approach. Research is needed to estimate the number of foodborne illnesses in Ireland for pathogenic bacteria associated with food e.g. *Salmonella*,	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	Listeria monocytogenes, *Campylobacter*, Shiga toxigenic *E. coli.(STEC).* Well structured and internationally recognised methods are necessary in this field to enable accurate estimates. Researchers should be cognisant of similar studies elsewhere: • United States of America (USA): Scallan Walters *et al*. (2025) Emerging infectious disease vol 31 (4) • United Kingdom (UK): Third study of infectious intestinal disease in the UK (IID3) (here). *Collaboration with the HPSC would be essential in this research work*.	
Food consumption data for the Irish population.	Food safety risk assessment requires accurate and comprehensive data on the food consumption habits of the Irish population including types of food, quantities consumed and frequency of consumption for all age groups. These data are also essential for nutritional analysis including identification of nutrient deficiencies, development of dietary advice and programmes on food reformulation. Ireland has developed excellent food consumption data sets for all age groups using the food diary approach which generates data that is both fit for risk assessment and dietary analysis purposes. However, as data becomes older at a time when consumption habits change	**1. National Pre-school Nutrition Survey II** **Lead:** Dr Breige McNulty, University College Dublin (UCD) **Funded by:** Food for Health Research Initiative. Supported by the Department of Agriculture, Food and the Marine (DAFM) **Start year:** 2023 **Report available:** Project underway

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	quickly, up-to-date data is continually required on a rolling programme basis. The National Children's Food Survey is the oldest data set not currently funded for update and should be prioritised for updating. Biomonitoring samples e.g. urine, are also useful for subsequent dietary analysis and analysis of chemical exposure and it would be desirable to include this aspect in any research programme such that biomonitoring samples are taken from participants during the survey and stored along with their metadata for future analysis. The FSAI has published a list of useful biomarkers in 2025 as part of its work under the Scientific Committee. See www.fsai.ie.	**2. NANS II- National Adult Nutrition Survey** **Lead:** Dr Janette Walton, Cork Institute of Technology (Technical University Munster) **Funded by:** DAFM, Food Institutional Research Measure 2019R445 **Start year:** 2019 **Report available:** Here. **3. NTFS II- National Teens' Food Survey II** **Lead:** Dr Breige McNulty, UCD **Funded by:** DAFM, Food Institutional Research Measure 17F231 **Start year:** 2017 **Report available:** Here. **4. NCFS II- National Children's Food Survey II** **Lead:** Professor Albert Flynn, University College Cork (UCC)

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
		Funded by: DAFM, Food Institutional Research Measure 15F674 **Start year:** 2015 **Report available:** Here. **5. BIO-Tilda study- The Irish Longitudinal Ageing Study (TILDA) Nutritional Biomarker Database Enhancement Initiative** **Lead:** Dr Anne Molloy, Trinity College Dublin **Funded by:** DAFM, Food Institutional Research Measure 13F492 **Start year:** 2013 **Report available:** Here. **6. NUTRIDATA- National nutrition databases for public health and new product development** **Lead:** Professor Dolores O'Riordan, UCD

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
		Funded by: DAFM, Food Institutional Research Measure 13F542 **Start year:** 2013 **Report available:** Here. **7. National Pre-School Nutrition Survey** **Lead:** Dr Janette Walton, UCC **Funded by:** Food for Health Research Initiative. Supported by the DAFM, the Department of Health (DoH) and the Health Research Board (HRB) **Start year:** 2010 **Report available:** Here.
Generate specific food consumption and analytical data on food supplements	Irish legislation defines food supplements as: "Foodstuffs the purpose of which is to supplement the normal diet and which are concentrated sources of nutrients or other substances with a nutritional or physiological effect, alone or in combination, marketed in dose form, namely forms such as capsules, pastilles, tablets, pills and other similar forms, sachets of powder, ampoules of liquids, drop	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	dispensing bottles, and other similar forms of liquids and powders designed to be taken in measured small unit quantities." The food supplement market is global with products easily available on the internet from jurisdictions outside the European Union (EU) where different rules are in place. Sometimes supplements can contain excess nutrients above physiological need, e.g. protein, vitamins, and minerals. Other supplements may contain high levels of caffeine, green tea extracts and botanicals. Supplements may also contain hazardous chemical constituents such as DNP (2,4-Dinitrophenol) despite the work of authorities to control the supplement market. The value and demand for food supplements can also act as an incentive for fraudulent activity by illegitimate operators, including the substitution of ingredients and the addition of illicit active substances. Food safety risk assessment requires good data on consumption and composition of these supplements. Specifically, data are required on: • The frequency of consumption and intake of supplements in those aged 9–65 years • Official/self-reported harmful effects associated with these supplements	

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• Composition, particularly the possible presence of illicit substances • Toxicity of substances that exert a physiological effect which are included in food supplements. **NOTE:** Nutrient declarations on labels of food supplements are based on average values and there are acceptable tolerances above and below the labelled level in Europe. Therefore, tested nutrient levels in supplements may be within these tolerances without breach of legislation.	
Generate specific food consumption data on sea fishery products for children	The data generated in the major food consumption studies, such as those carried out by the Irish Universities Nutrition Alliance (IUNA), are not targeted specifically towards consumers of sea fishery products (e.g. bivalve molluscs, univalve molluscs). Therefore, information in this area is needed to enable accurate exposure assessments for food safety risk assessment. A 2016 FSAI Scientific Committee report on marine biotoxins highlighted the need for a specific food consumption survey on sea fishery products, in order to better characterise the risk from exposure to biotoxins and other contaminants from consuming shellfish. A Food Institution Research Measure (FIRM) project (SCaRES) funded by the DAFM and carried out by UCD generated information on	**1. SCaRES- Seafood Consumption and Risk Exposure Study** **Lead:** Professor Eileen Gibney, UCD **Funded by:** DAFM, Food Institutional Research Measure 17F264 **Start year:** 2017 **Report available:** Here.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	seafood (fish and shellfish) consumption in adults, aged 18 years and over. Similar detailed data is needed for toddlers (aged 12–35 months) and children (aged 3–12 years). Particular attention should be paid to capturing consumption data on bivalve molluscs.	
Use and consumption patterns of seaweed and halophytes in Ireland	Seaweed is a relatively underexplored source of human nutrition in Ireland. Market research has indicated that the number of seaweed-flavoured foods and drinks available in Europe increased by 7% between 2011 and 2015, mainly due to the perceived health benefits of seaweed. In 2020, the FSAI Scientific Committee published a report titled *Safety considerations of seaweed and seaweed-derived foods available on the Irish market*. The report noted several gaps in information that would be necessary to conduct a comprehensive risk assessment. **Research needs:** • Quantitative information about direct consumption of seaweed and consumption of seaweed as an ingredient in other foods (not including additives, e.g. thickeners) for all age groups, ranging from those aged 12 months upwards. • A survey with a representative sample of seaweed, suitable preparation techniques, coupled with information on how the	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	consumed seaweed was obtained (foraged, purchased at farmers' markets, purchased in health food shops, online or retail) • A study into the effects of food processing on the presence of harmful chemicals e.g. heavy metals, iodine, should be conducted to underpin advice to consumers on how to minimise exposure to such chemicals • A market survey with representative sampling in Ireland on the availability of edible seaweed species and halophytes and the occurrence of harmful chemicals will inform the need for risk management actions.	

Emerging risks and threats

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
The availability and mining of open-source data to predict emerging food safety risks	Due to the complex drivers which impact emerging threat and risks, the FSAI needs automated systems to identify, process, interpret and prioritise signals of emerging risk indirectly and directly impacting the food chain. The use of advanced data analytics and artificial intelligence (AI) systems are likely required to deal with the type and scale of data, and these need to be presented in an intuitive dashboard for evaluation by experts as the first stage of an emerging risk identification system. The drivers of emerging risk can be categorised into the traditional PESTLE format: P for Political, E for Economic, S for Social, T for Technological, L for Legal, and E for Environmental. Any single driver can result in the emergence of a new food safety risk however, it is likely that more than one will combine to create an emerging risk. When looking for emerging risks it is important to seek data that signal their emergence. Such data can be in either a structured or unstructured form; in addition, they often need to be collated and combined before data analysis, to reveal patterns and correlations. Trade flows, weather patterns, media reports, digital media exchanges and peer-reviewed literature are all examples of data sources that can be used to seek signals of emerging chemical and biological risks to	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	food. Insights into examples of emerging risks can be gained through the European Food Safety Authority (EFSA) emerging risk exchange network reports: www.EFSA.europa.eu. Research is needed to identify suitable data sources, to test them for their ability to identify emerging risks, to provide tests for validity of these data and to develop suitable dashboards and alerts for ongoing monitoring and surveillance.	
Myxozoa in fish	The 2024 EFSA opinion on parasites in fishery products acknowledges the potential issue of Cnidaria (Myxozoa) including the myxoposridian genus *Kudoa*. The impact, in terms of post mortem degradation of muscle tissue, is a concern in harvesting from infested wild or farmed fin-fish. The FSAI is aware of anecdotal evidence of increasing prevalence within and across fin-fish species, based on increasing incidence of visible post mortem tissue degradation. Public health connotations including allergenicity are not well understood, and mitigated to significant extent by visible tissue changes resulting in exclusion form the food chain as 'obviously contaminated'. The FSAI is interested to learn of prevalence in different species and production systems within Ireland, and extent to which post mortem autolysis correlates with infestation. Understanding of risk factors for presence e.g. production method, evisceration, catch location, and water temperature would also be of interest. Data in potential	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	allergenicity and allergenic reaction would be required to assess the human health impact if any.	
Vibrio species in food of aquatic animal origin	EU legislation does not prescribe any quantitative limit for Vibrio species, nor any explicit obligation to assess the presence nor concentration of this organism on food. A 2024 EFSA opinion suggested an overall prevalence for Vibrio species in the order of 20%. It noted increasing risk with increasing temperature and salinity changes arising from climate change. A further 2024 EFSA technical specification recommended Vibrio species amongst bacterial indicators of the prevalence of antimicrobial resistance (AMR), however sampling plans to derive value from investigation of Vibrio AMR require data on the underlying prevalence of the organism. Previous work (Turner *et al*., 2015) identified the potential of Vibrio species in the biotransformation and hence prevalence of emerging biotoxins in northern EU waters. Overall EU sufficiency for seafood is in the order of 40% with substantial quantity of import from areas of the world where Vibrio species are already endemic, and consequent potential to influence Vibrio spp. risks in seafood consumed in EU. Research projects should focus on representative sampling to characterise the prevalence, quantity and pathogenicity of Vibrio species in: • Indigenous mollusc aquaculture	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• Indigenous finfish aquaculture • Wild-fisheries in Irish EFZ • Seafood imports entering EU in Irish BCPs.	
Food safety risk awareness within sustainability initiatives	A driving factor within food chain evolution is the pursuit of sustainability to ensure that food production can endure to meet the needs of tomorrow. This is a broad area involving for example initiatives at pre-harvest level to reduce environmental impacts such as greenhouse gas emissions; initiatives in processing improve nutrient retention, or packaging to, or labelling to minimise food surpluses which become waste. In some circumstances, e.g. introduction of a novel feed additive for livestock, or a novel food-contact material in packaging, there is a regulatory requirement to assess impact on safety of food. In other instances, there is no explicit requirement to assess impact on food safety before producing food under that sustainability initiative. Ramifications for food safety can be relatively direct, e.g. a chemical leaching from novel packaging into food, or relatively indirect, e.g. an animal feed additive modifying animal microbiome to facilitate more faecal shedding of a biological hazard. Any change to how food is produced has potential to change the safety of the food. The FSAI is interested in ensuring sustainability initiatives occur, and that they occur with an explicit regard to food safety. Many initiatives	**1. Efficacy & Safety of Nitrification and Urease Inhibitors** **Lead:** Patrick Forrestal, Teagasc **Funded by:** DAFM, Food Institutional Research Measure 2021R447 **Start Year:** 2021 **Report not available.** **2. Assuring the Chemical and Microbial Safety of Organic Waste Spread on Land in Ireland** **Lead:** Declan Bolton, Teagasc **Funded by:** DAFM, Food Institutional Research Measure 2021R453 **Start Year:** 2021 **Report not available.**

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	begin with a research impetus, before practical piloting and commercial application. An initiative which contributes to one aspect of sustainability whilst detracting from safety, is not sustainable. Conversely some initiatives with potential deleterious food safety impact, can often be approached in a manner that ensures food safety is managed if it is incorporated at the design stage, e.g. land spreading of anaerobic digestate. When selecting, designing or approving sustainability-oriented food research projects, including piloting and commercialisation initiatives an explicit criterion should be the consideration of food safety risks and the management of those.	

Food science and technology

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
Safe use of biosolids on agricultural land used for food production	In 2008, the FSAI Scientific Committee published a comprehensive report on the food safety implications of land spreading of organic agricultural waste and organic municipal/industrial waste on land in Ireland. Research in progress and published (see projects 1 and 2 listed) has/is addressing some of the safety aspects associated with spreading organic agricultural (OA) material, and organic municipal industrial (OMI) materials on land used for agriculture. Further research is needed to expand on some of this work in respect of biosolids (solid treated waste from wastewater treatment plants) and sewage sludge (solid/semisolid waste that is treated but not to an extent that reduces the biological or chemical hazards). In particular, the FSAI would welcome research that provides data on the: • Possible bioaccumulation of chemical hazards (heavy metals, persistent organic pollutants and microplastics) in different soils due to use of biosolids and/or sewage sludge and the uptake of these chemicals in different pasture plants, tillage crops and fresh produce grown in these soils. *(*Note:	**1. Assuring the Chemical and Microbial Safety of Organic Waste Spread on Land in Ireland** **Lead**: Declan Bolton, Teagasc **Funded by:** DAFM, Food Institutional Research Measure 2021R453 **Start year:** 2021 **Report not available.** **2. Health and Water Quality Impacts Arising from Land Spreading of Biosolids** **Lead:** Mark Healy **Funded by:** Environmental Protection Agency (EPA) **Start year:** 2014 **Report available:** Here. **3. AD-Policy: The comparative public and animal health risks associated with spreading**

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	project 2 listed looked at uptake of some chemical hazards in rye grass). • Detailed inventory of biosolids produced and used in Ireland including the amount used on agricultural land and what crops are grown subsequently on such land. • Development of validate protocols for safe treatment and use of different organic feedstocks including their hazard (chemical and biological) profile and safe application to land used for food production.	**Anaerobic Digestate, animal manure and slurry on land: Science, Policy and Practice** **Lead**: Declan Bolton, Teagasc **Funded by:** DAFM, Food Institutional Research Measure 14SF847 **Start year:** 2014 **Report available:** Here.
The safety of plant-based protein sources	Globally, there is a general desire to move to a more sustainable food system which, among other actions, requires us to embrace a more sustainable diet. Some research suggests that this may require people to consume less meat and, consequently, there has been an increase in the development and availability of plant-based protein sources. Research is needed to: • Establish the allergenicity, if any, of plant-based protein alternatives.	**1. Duckweed as a Novel, Sustainable Source of Protein for Ireland** **Lead:** Marcel Jansen, UCC **Funded by:** DAFM, Food Institutional Research Measure 2021R487 **Start year:** 2021 **Report not available.** Note: It is unclear if the food safety angle of this work has been taken account of in the study.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• Determine the presence and risk of pathogenic microorganisms throughout the shelf life of plant-based protein alternatives. • Study the chemical hazards associated with the plant-based protein source and use of food additives to retain essential properties such as organoleptic and stability properties. • Examine the presence, if any, of antinutrients in plant-based protein alternatives and their effect on nutrient intake from the final food. • Develop approaches to mitigate any risks to food safety that have been identified. Note: There is some Irish research in this area, but it is unclear if food safety is an aspect of the research.	**2. Protein-I: Shared Island Sustainable Healthy Nutrition** **Lead:** Professor Lorraine Brennan, UCD **Funded by:** DAFM, Food Institutional Research Measure 2021R546 **Start year:** 2021 **Report not available.** Note: It is unclear if the food safety angle of this work has been taken account of in the study. **3. A retail prevalence study to investigate microbiological contamination levels in ready-to-eat (RTE) plant-based dairy and meat substitutes** **Lead:** Dr Mary Lenahan, FSAI **Funded by:** The EFSA Focal Point tailor-made activities. **Start year:** 2025 **Report not available.**

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
Exploration of AI and Machine Learning tools to enhance risk identification and inform the risk-based delivery of food safety official controls	Food businesses in Ireland are subject to official controls to ensure compliance with food safety legislation and protect public health. The current system for determining inspection frequency relies on static risk categorisation methods, as outlined in *Guidance Note 1 (GN1)*, which assesses businesses based on predefined risk factors such as business type, scale, and handling methods. Artificial Intelligence (AI) and machine learning (ML) offer an opportunity to modernise risk identification and inform the delivery of food safety official controls by dynamically adjusting inspection frequency based on open-source data allowing business profiling, with the potential to allow for better allocation of resources and improved public health outcomes. Areas of research should include: • Develop predictive ML models that classify food businesses based on open-source data and dynamic risk factors. • Integrate structured and unstructured data sources (e.g. food business type, profile, sector complaint records, supply chain data) to improve risk profiling.	None reported.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• Enhance the risk-based service planning framework by shifting from static risk categorisation to a hybrid model (static + dynamic risk scoring). • Consider opportunities to improve detection of fraudulent and deceptive practices by incorporating anomaly detection techniques. • Validate the effectiveness of AI-driven risk assessment in informing official control scheduling and regulatory decision-making. • Provide recommendations for regulatory integration to ensure AI-driven insights are transparent, explainable, and legally robust. Research of this nature would seek to increase efficiency, and effectiveness of official control delivery, by exploring opportunities in leveraging AI and machine learning, to enhance official controls, optimize inspection scheduling, improve food safety outcomes, ensuring efficient use of regulatory resources while maintaining consumer protection standards. Research including an official agency of the FSAI may also provide access to official controls data which is not publicly available.	

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	However, such data is confidential and legally protected so access would need to be agreed prior to any research application that included this data source.	
Explore the use of an AI and ML-based automated online market surveillance system for identifying non-compliant food products in the Irish market	The rapid growth of online food retailing has introduced new challenges for food safety authorities in ensuring compliance with food safety legislation. Unlike traditional food businesses, online marketplaces operate in a dynamic and decentralized manner, making it difficult for regulators to effectively monitor non-compliant food products. Current market surveillance approaches rely on manual checks, consumer complaints, and limited data analysis, which are insufficient to address the scale of the issue. The use of AI and ML offers an opportunity to modernize and enhance market surveillance by automating the identification of non-compliant food products sold online. AI-driven tools can crawl, scrape, analyse, and classify online listings to detect potential food safety violations, such as mislabelling, unauthorized health claims, presence of banned substances, and fraudulent food products. The primary objective of a research project in this field is to explore the potential opportunity for an AI and machine learning system that	None reported.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	will automate the detection of non-compliant food products sold online in Ireland with potential for to integrate the insights into the risk-based official control framework.	
Identifying honey authenticity analytical methods with a view in harmonisation for official control purposes	Honey, a natural product with increasing vulnerability to adulteration, poses significant challenges to consumer trust and market integrity. While the EU Honey Directive mandates the analysis of hydroxymethylfurfurale (HMF) and diastase activity, these parameters alone are insufficient to comprehensively detect fraudulent practices. To strengthen official control capabilities, there's a critical need to explore and harmonise additional analytical methods that can enhance honey authenticity testing across the EU. This research project should evaluate a range of potential techniques designed with the aim to detect fraudulent practices, including: • Antioxidant activity (DPPH and FRAP) • Flavour components • Hydrogen peroxide and volatile fraction • Amino acid profiling (proline, tyrosine)	None reported.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• Other enzymes: glucose oxidase, catalase, and phosphatase • Foreign enzymes: beta/gamma amylase, heat-stable alpha-amylase, beta-fructofuranosidase • Maillard reaction of proteins • Maillard reaction by-products: furosine, furan, and acrylamide • Physico-chemical parameters: acidity, total soluble solids, colour, electric conductivity, saccharides • Enzymatic and microbial activity testing • Carbon isotope ratio. Principal Component Analysis (PCA) and other multivariate data analysis approaches to distinguish honey samples with varying degrees of processing would be useful. By systematically analysing the effectiveness of these methods, this project should aim to provide a scientific basis for recommending specific analytical methods for optimal official controls of honey authenticity, ensuring consumer protection and market integrity across the EU.	

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	Researchers should note the work of the FSAI Scientific Committee regarding validation of analytical methods fit for enforcement purposes and approach the development of such methods accordingly. See report here.	

Biological safety

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
Reduction of AMR as a foodborne hazard	The development of AMR in bacteria remains one of the biggest threats to human health in the 21st century. Ireland has embarked on a national action plan on AMR, which is designed to prevent, monitor, and combat AMR across the human health, agricultural and environmental sectors. Ireland's second One Health National Action Plan on Antimicrobial Resistance 2021-2025 (iNAP2) was published jointly by the DoH and DAFM in November 2021. Research continues to be one of the strategic objectives. That effort has provided tools to balance the imperatives of maintaining/improve animal health whilst reducing the reliance on antimicrobial usage in the husbandry of livestock for food production. At this stage, the FSAI would be interested in research into concepts such as: • Establishing the extent of association, including potential time-lag between antimicrobial usage in animals, and prevalence of AMR bacteria in foods derived from those animals. This should	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	validate the cause/effect hypothesis that efforts in reducing usage reap benefit in terms of foodborne risk management, which should in-turn motivate on-going usage reduction initiatives. In general terms this would require active development of surveillance plans with representative sampling initiatives, to allow time-series comparisons. • Assess extent of usage and contribution to AMR of coccidiostat usage • Assess both risk and benefits for foodborne AMR from prohibition of ZnO as a feed additive in pigs • Assess inter-animal-crop AMR transfer through e.g. withdrawal period milk and manure recycling, and recommend risk management strategies • Assess consumer/market benefits of labelling scheme to enable purchase from farms/systems with lower antimicrobial usage.	

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	Researchers should note that there is extensive research in this area and the FSAI cannot be certain that aspects of its suggested research needs have been covered. A thorough check on the state-of-the-art in this field would be prudent before submitting research applications.	
'One Health' mitigation measures to reduce the risk of *Shiga Toxin-producing E. coli (STEC* infection in humans in Ireland	Ireland has one of the highest reported rates of STEC illness in people in Europe. Multiple serotypes are involved, in addition to O157 and O26, which are the most common. While the high reported rate is in part due to the active surveillance of all STEC infections in Ireland, infection from environmental sources (for example private well water and on-farm exposure) is a major contributor. Food appears to play a lesser role in human STEC infection, but environmental contamination of food produce and food animals, (for example, cattle and sheep) can still cause outbreaks. Control of STEC requires a 'One Health' approach that involves mitigations with an environmental, animal production and human health dimension. Research is needed to:	**1. Detection and Risk Management of Verotoxigenic *E. coli* in the Water Environment (DERIVE)** **Lead:** Dr Liam Burke, National University of Ireland Galway (NUIG) **Funding body**: EPA **Start year**: 2022 **Report not available.** **2. VTEC One for Health Surveillance of Verocytotoxigenic *E. coli* in Ireland: A One Health Approach** **Lead:** Dr Geraldine Duffy, Teagasc Ashtown

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• Enhance existing surveillance studies to identify risk factors for higher prevalence of STEC in fresh produce, food animals, water sources and other environmental sources • Identify animal production practices that mitigate risk of faecal shedding of animals which may result in subsequent contamination of environmental sources e.g. pre-harvest dietary change or husbandry interventions, host genetic markers of super shedding likelihood • Investigate the role of pig carriage and shedding of STEC strains of potential human health significance • Investigate effectiveness of protocols to manage STEC risk in production of raw milk or raw milk dairy products, including animal husbandry, milking hygiene and post-harvest risk mitigation.	**Funded by:** DAFM, Food Institutional Research Measure 15F629 **Start year:** 2015 **Report not available.** **3. Detection of Environmental Sources of Infectious Disease in Groundwater Networks (DESIGN)** **Lead:** Dr Jean O'Dwyer, UCC **Funded by:** EPA **Start year:** 2018 **Report available:** Here. **4. SpatioTemporal Epidemiology of Primary Waterborne Infections - cryptoSporidium and vtEc (StepWise)** **Lead:** Dr Paul Hynds, Technological University Dublin **Funded by:** EPA

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
		Start year: 2018 **Report available:** Here. **5. An investigation of Verocytotoxigenic *E. coli* super-shedding in beef and dairy cattle and the factors underpinning human virulence potential and strain emergence as a result of vt phage transduction "VTEC-SUPVIRT"** **Lead:** Dr Geraldine Duffy, Teagasc, Ashtown. **Funded by:** DAFM, Food Institutional Research **Start Year:** 2012 **Report Available** Here.
Maximising *Campylobacter* risk management within chicken slaughter	*Campylobacter* remains the most common cause of bacterial gastroenteritis in people in Ireland, and *Campylobacter* is frequently detectable on raw chicken at Irish retail level. In 2011, the FSAI Scientific Committee made various recommendations to manage the *Campylobacter* risk from farm to fork. Since 2018, legislation requires slaughterhouses operators to apply a quantitative *Campylobacter* microbiological criterion in	**1. Prevalence and levels of *Campylobacter* in broiler chicken batches and carcasses in Ireland in 2017-2018** **Lead:** Helen Lynch, UCD **Publication year:** 2022

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	assessing their process hygiene and to take corrective action regarding resolving non-compliance. Whilst the FSAI has identified thinning as a particular risk factor, there is a real commercial challenge in developing production systems that avoid this entirely, so protocols to manage its risks are appropriate. Optimisation of slaughter practices towards minimisation of *Campylobacter* numbers on chicken meat has utility to contribute to overall risk management, within a broader holistic food chain. Investigations of practical effectiveness of *Campylobacter* interventions in an Irish context should facilitate progress towards incorporation into approved commercial establishments. The Clean Broilers project examined the impact of key processing stages and flock variables on the prevalence and levels of *Campylobacter* on broiler carcasses. Investigations of practical effectiveness of *Campylobacter* interventions in an Irish context should facilitate progress towards incorporation into commercial establishments. Candidate processes include the following:	**Report available:** Here. **2. A Review on Campylobacteriosis Associated with Poultry Meat Consumption** **Lead:** Peter Myintzaw, TUD, City Campus **Publication year:** 2021 **Report available:** Here. **3. Clean Broilers - Clean Broilers Through Enhanced Farm Biosecurity, Processing Prerequisites and HACCP Based Interventions** **Lead:** Dr Declan Bolton, Teagasc, Ashtown **Funding body**: DAFM, Food Institutional Research Measure 15F641 **Start year**: 2015

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• Investigate the optimisation of thinning protocols to ensure to identify key steps in managing introduction of *Campylobacter* colonisation of remaining chickens that are not harvested • Investigate optimisation strategies for key process steps to reduce *Campylobacter* concentrations with particular focus on the pre-scald bleed, scald process, defeathering process, carcass washing process and primary chilling process • Develop and test practical measures to prevent or minimise cross contamination with *Campylobacter* between flocks during slaughter, considering that some flocks will be *Campylobacter* negative and others *Campylobacter* positive with varying levels of contamination. Focus being on measures that account for the quantitative risk (contamination level) presented by a flock rather than its qualitative risk (positive/negative).	**Report available:** Here. ***4. Campylobacter* Control on Irish Broiler Farms (Campy-control).** **Lead:** Paul Whyte, UCD **Funding body**: DAFM, Food Institutional Research Measure 15F641 **Start year**: 2012 **Report available:** Here. **5. Poultry microbiome – interaction between virus infection and *Campylobacter*** **Lead: J**ignasha Patel, Teagasc in collaboration with the Agri-food and Bioscience Institute Northern Ireland **Funding body**: EU Marie Curie/Teagasc

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
		Start year: 2023 **Report not available.**
Exploring the food safety risk of Yersinia in Ireland	Yersiniosis is the fourth most reported gastrointestinal infection, and the third most common foodborne zoonotic pathogen in the EU (ECDC, 2024). Yersiniosis describes a gastrointestinal infection by the gram-negative bacteria *Yersinia enterocolitica* and *Yersinia pseudotuberculosis*, the former being the more common cause implicated in 92% of USA cases. The primary symptoms of yersiniosis include fever, diarrhoea and abdominal pain but can also include sore throat, erythema nodosum and in more serious cases, sepsis or reactive arthritis. However, fatality rates are low. Pigs are the primary asymptomatic carriers of the human pathogen *Yersinia enterocolitica* however rodents, sheep, cattle, cats, dogs and horses are all reservoirs. *Y.enterolitica* poisoning cases have been associated with the consumption of poorly prepared pork, chicken, milk, salmon, ready-to-eat salads and vegetables which have	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	been contaminated with human or animal-derived faecal contamination (McGill, Hill and Solomon, 2013). Yersiniosis is a notifiable disease in Ireland and recent data in humans shows a concerning increase in reported disease: 40 cases in 2024, 30 cases in 2023 and 17 cases in 2022. Recent reports from the UK suggest that *Y. enterocolitica* isolates from food characterised as biotype 1A (previously considered non-pathogenic), has sequence types from WGS which were previously isolated from human cases. In Ireland we have zoonosis data on Yersinia prevalence but not concentrations in farm animals (see here) but little to no data in food of animal origin or non-animal origin. Research of interest to the FSAI includes: • Representative sampling and monitoring of foods of terrestrial and aquatic animal origin and ready-to-eat salads and vegetables and analysis for prevalence and concentrations of *Yersinia enterocolitica* and *Yersinia pseudotuberculosis*	

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• WGS of isolates and comparison with genotypes of isolates from human yersiniosis cases and analysis of virulence traits.	

Allergens

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
Development of data for allergen risk assessment	Currently, a food can be deemed unsafe if the undeclared significant presence of any of the 14 EU-regulated food allergens is established. The FSAI Scientific Committee has published a scientific approach to risk assessment which aims to provide a scientific basis for a more proportionate approach, while still protecting consumer health. One element of the risk assessment requires the application of reliable data on the prevalence in Ireland of immune-mediated reaction to the EU 12 (EU 14 minus gluten and sulphite) allergens. Research is required to provide an accurate baseline of prevalence of immune-mediated reaction to the EU 12 (EU 14 minus gluten and sulphite) allergens in Ireland, as well as a scientifically robust methodology for updating such data in a national register.	None notified.

Chemical safety

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
Identification of mitigation measures for mycotoxins in Irish crops	Consumer protection from the harmful effects of mycotoxins requires good mitigation measures to prevent contamination on the farm, and during transport and storage of plant-based food and feed. At manufacturing level, it is important that supplies of these ingredients are safe at the point of delivery. Due to climate change and other factors, it is expected that the profile and concentration of mycotoxin contamination of Irish crops and Irish foods including foods of animal origin will change in the future, as warmer but wetter weather prevails. Therefore, there is a need to identify mitigation measures for mycotoxins, tailored to Irish production systems, that can be implemented at various stages of the food and feed supply chains.	**1. Mycotox-I: Field to Fork Assessment and Mitigation of Mycotoxin Exposure Risk on the Island of Ireland** **Lead:** Fiona Doohan, UCD **Funded by:** DAFM, Food Institutional Research Measure.2021R460 **Start year:** 2021 **Report not available.**
Generation of occurrence data for perfluoroalkyl substances (PFAS) in food	Perfluoroalkyl substances (PFAS) are a group of man-made chemicals that are manufactured and used in a variety of industries around the world (e.g. textiles, household products, firefighting, automotive, food processing, construction and electronics). Exposure to these chemicals may lead to adverse health effects. People can be exposed to PFAS in different ways, including food. These	1**. INVESTigating PFAS from Source to sink - Assessing risk to inform a PFAS STrategy in Ireland.** **Lead:** Fiona Regan, Dublin City University **Funded by:** EPA **Start year:** 2023

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	substances are most often found in drinking water, fish, fruit, eggs, and egg products. In 2020, the EFSA published a Scientific Opinion on the risk to human health related to PFAS in food. The EFSA considered the decreased response of the immune system to vaccination to be the most critical human health effect when determining a health-based guidance value. In their conclusions, the EFSA identified exceedances of the health-based guidance value by the population and therefore, a concern for human health is evident. In response to these findings the European Commission (EC) put in place maximum levels for certain foodstuffs (Regulation 2022/2388) and called for further monitoring (Recommendation 2022/1431) for the years 2022 to 2025 to gather data on occurrence in foodstuffs for which data was lacking. They indicated that monitoring should include a wide variety of foodstuffs reflecting consumption habits, including fruits, vegetables, starchy roots and tubers, seaweed, cereals, nuts, oilseeds, food for infants and young children, food of animal origin, non-alcoholic drinks, wine and beer. Considering that PFAS can enter the food chain via several pathways, i.e. environmental contamination, food packaging, etc., research into the	**Report not available.** *Note: This project has relevance in this space but is not addressing all aspects of the research need.*

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	occurrence of PFAS in these sources and its transfer to food is needed to inform future risk assessments and risk management measures. Mitigation measures need to be developed to inform best practice for avoidance of PFAS contamination of food above safe levels.	
Generation of migration data for chemical substances that move into foods from proposed/new food contact materials	Some groups of food contact materials e.g. plastics are already subject to specific EU measures, which include migration limits to protect public health. Testing for migration is generally done in simulants, which are specified in legislation. However, this is a fast-changing field of work and new food contact materials are being proposed or are being researched that may pose food safety risks as yet unknown, including the use of more so-called “natural substances” such as bamboo, wood, rice and wheat. There is also the continued growth of recycling to provide new more sustainable sources of food contact materials in line with developing environmental polices Two major food issues arise. The first is the more general issue of risk assessment, which requires an understanding of the migration of the constituents of food contact materials into foods or food simulants. The second issue is the migration of potentially unsafe and perhaps unknown chemicals from new and emerging food contact materials and recycled materials and their associated hazards e.g. allergen risks, unknown contaminants etc. The increasing use of recycled food contact materials,	1**. New Active Sustainable Packaging with Natural Antimicrobials for Shelf-Life extension of Fish Products** **Lead:** Malco Cruz-Romero, UCC **Funded by:** DAFM, Food Institutional Research Measure.2021R412 **Start year:** 2021 **Report not available.** **2. PECTIPACK- Eco-friendly Compostable Pectin based Packaging Material Derived from Waste Sources of Fruit Pulp and Its Validation in Bread Packaging** (not clear from project summary if food safety is being considered) **Lead:** Dr Joe Kerry, UCC

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	particularly plastics for re-use as food contact materials may also present issues for food safety. Research on the use of natural/sustainable or so-called green alternatives to plastic, printing inks, paper and board, and intelligent/active packaging are needed to investigate their potential food safety implications when in contact with food and to safeguard consumer health and build competence for regulators to evaluate these materials. *Research should build on the current state-of-the-art as this is a very active research area.*	**Funded by:** DAFM, Food Institutional Research Measure. 2019R248 **Start year:** 2019 **Report not available.**
Prevalence of natural plant toxins in Irish horticulture crops and food animals	Increased knowledge on the toxicological risks posed by naturally occurring substances (e.g. tropane, pyrrolizidine, opium, quinolizidine and glycoalkaloids, erucic acid, and cyanogenic glycosides) has led to the implementation of several regulatory measures. Some of these substances are acutely toxic, and exposure must be maintained at very low levels. In the context of EU sustainability initiatives, the desire to increase biodiversity and hence reduce pesticide usage may exacerbate the risks of natural plant toxins in Irish food in the future. Irish food must comply with regulatory limits which may be a challenge. Hence there is a need to establish the seasonal prevalence of these hazards in Irish-grown crops, and Irish food animals grazing and feeding	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	on pastures or crops, and to develop valid and practical mitigation strategies consistent with the targets of the *EU Farm to Fork Strategy* (e.g. good agricultural practices, variety development). Specifically, research is needed to: • Establish the seasonal presence of tropane, pyrrolizidine, opium, quinolizidine and glycoalkaloids, erucic acid and cyanogenic glycosides in relevant Irish grown crops and in food animals grazing and feeding on pastures or crops. • As appropriate, develop mitigation measures both at production and processing levels that ensure Irish food and feed compliance with relevant EU maximum levels for these natural plant toxins. The need to reduce pesticide usage should be accounted for in this research. • Understand the possible transfer of these natural toxins to food-animals, their tissues and milk.	
Emerging novel toxins in the Irish aquatic environment – characterising algal species and their potential	Climate change is altering the aquatic environment in terms of temperature, salinity, and nutrient availability. Toxic events due to the growth of toxic phytoplankton need to be anticipated and measures put in place to protect public health.	**1. ToxVib- Genomics to Investigate Risks of Toxin-Producing Vibrio in Irish Shellfish** **Lead:** Dr Aoife Boyd, NUIG

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
impacts, due to climate change, on human health	Emerging risk work at EU level has shown the existence of toxigenic species of phytoplankton in areas outside their previously known range. For example, *Alexandrium* spp. and PSP have begun to occur in Kerry . Ciguatoxin has been detected in fish in the Canaries and phytoplankton carrying the toxin genes has been detected in the Eastern Mediterranean. Blue green algal blooms in freshwater bodies are also becoming a more frequent occurrence with potential for toxigenic strains and accumulation in aquatic animals. Vibrio species have been detected in Europe expressing tetrodotoxin (TTX). Specific research needs include: • An understanding of the changes in the aquatic environment marine, estuarine and freshwater due to climate pressures that favour the growth of certain known but hitherto exotic toxic phytoplankton species. This includes the presence if any, of phytoplankton, biotransformation organisms, or the toxins themselves new to those regions e.g. tetrodotoxins and ciguatoxins • Research into the existence of hitherto unknown species of toxic phytoplankton in Irish waters and the conditions which favour their growth.	**Funded by:** DAFM, Food Institutional Research Measure 2019R531 **Start year:** 2019 **Report not available.**

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• Molecular data on new phytoplankton species and the presence and expression of toxin genes.	
Investigations on the reduction of the usage levels of the food additives; sulphur dioxide and sulphites (E 220-228) in certain foods	Sulphur dioxide and sulphites (E 220-228) are authorised food additives in the EU and their conditions of use are specified in Regulation (EC) No 1333/2008. In 2022, EFSA published its re-evaluation of these food additives, which identified that certain dietary exposure scenarios raised a safety concern for various population groups. As a result, risk management measures are under consideration at EU level, which may include the deletion or the reduction of the maximum permitted levels for some provisions. As part of the FSAI's monitoring activities, it is apparent that these food additives are particularly used in Ireland for the preservation of peeled potatoes under food category 4.1.2 'Peeled, cut and shredded fruit and vegetables', and breakfast sausages and burger meat (with a minimum vegetable and/or cereal content of 4% mixed within the meat) under food category 8.2 Meat preparations as defined by Regulation (EC) No 853/2004 in Regulation (EC) No 1333/2008.	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	Research is needed to: • Investigate what reductions to the usage levels of these food additives are feasible in the aforementioned foodstuffs whilst maintaining the necessary technological function. • If looking at alternatives to these food additives, consideration should be given to the food additives legislation (Regulation (EC) No 1333/2008).	

Public health nutrition

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
Review of fortified foods on the Irish market	As part of the EU Farm to Fork strategy the EC is planning to establish 'nutrient profiles', that is, maximum amounts for nutrients such as fat, sugar and/or salt in foods, above which the use of nutrition or health claims would be restricted or forbidden. For example, breakfast cereals exceeding a sugar limit could no longer advertise their fibre or vitamin content. Information on the fortified foods on the market can inform on the number and type of products which may be affected by the introduction of nutrient profiles. There is currently no centralised database on the levels of fortification which are prevalent in Ireland, and no information on what levels of fortification are common on the Irish market. Research required includes a review which would provide information on: • The prevalence of fortified foods available on the market • The prevalence of food fortification among different food categories • The specific nutrients with which products are commonly fortified. Information on the levels of nutrients present could be reviewed in line with nutrient upper safe intake levels (ULs) to assess the safety of such products.	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
Reduction of fat, sugar, and salt in consumer foods	Obesity and cardiovascular diseases are major threats to the health of the Irish population. Reformulation, with a focus on reductions in calories, saturated fat, sugar, and salt to improve the nutritional profile of food, is an important long-term activity to combat food related ill health. Research should focus on the feasibility of producing food products that meet all reformulation targets set by the DoH (i.e. saturated fats, sugar, and salt) across all consumer food categories (prepacked and non-prepacked food). Reformulation should simultaneously address all relevant nutrients of concern in a product; for example, reducing sugar whilst not increasing saturated fat, salt, and calorie content. Reformulation research on sugar should seek to identify practical options for the replacement of sugar with nutrients containing much lower calorific value (e.g. fibre), to ensure an energy reduction in the product as well as a reduction in sugar content. Such replacement options need to be rigorously researched, to ensure safety for all population cohorts, including children and those with fibre-sensitive conditions such as irritable bowel syndrome and inflammatory bowel disease. Research should also investigate the potential impact of reformulation efforts for those on restricted diets. For example, individuals with inborn	*See food consumption studies listed earlier in this report.* **1. FORC- Food Reformulation for Consumers: Understanding barriers to consumer acceptance of reformulated food products** **Lead:** Prof Patrick Wall, UCD **Funded by:** DAFM, Food Institutional Research Measure 13F460 **Start year:** 2013 **Report available:** Here. **2. PROSSLOW- Development of Consumer Accepted Low Salt and Low Fat Irish Traditional Processed Meats** **Lead:** Dr Maurice O'Sullivan, UCC **Funded by:** DAFM, Food Institutional Research Measure 11F026 **Start year:** 2011

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	errors of metabolism e.g., phenylketonuria who can't metabolise aspartame. Research to identify potential adverse effects need to be quantified and such research should also include exploration of mitigating measures (e.g. warning labels, etc.).	**Report available:** Here. *Note: There may also have been research funded by DAFM in this area prior to 2010 on ready meals and bread.*
Risk assessment for high dose vitamins and mineral supplements	The EFSA has been tasked by the EC to review past opinions on the tolerable ULs for vitamin A, folic acid/folate, vitamin D, vitamin E, vitamin B6, iron, manganese and β-carotene and to take into account recent scientific developments and evidence. For example, EFSA has released its "Scientific opinion on the Tolerable Upper Intake Level (UL) 1 for vitamin B6" where they propose to reduce the UL for vitamin B6 from 25 mg/day to 12.5mg/day. Based on data from case reports and recent nutrivigilance data, a causal relationship between high vitamin B6 intakes and peripheral neuropathy is well established and is the critical effect on which the UL is based. While hypotheses for the potential mechanisms of toxicity have been recently put forward, the casual mechanisms are still unknown. Considering the popularity of vitamin B6 and availability to the public, more work is warranted to better understand the safety profile of high dose vitamin B6 supplements. In addition, in the conclusions of their draft opinion, EFSA put forward a number of research recommendations:	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• Additional research is needed regarding potential differences in the toxicity profile of the different vitamers of vitamin B6. • Additional research on toxicokinetics and toxicodynamics could help to refine the derivation of an uncertainty factor. • Further investigation of the mechanisms of vitamin B6 toxicity is needed and the identification of genetic traits that may influence individual susceptibility. EFSA has identified several research recommendations for each nutrient (vitamin A, folic acid/folate, vitamin D, vitamin E, vitamin B6, iron, manganese and β-carotene). Such information is required to further understand the safety profile of high dose supplements containing these nutrients.	
Nutrient degradation of powdered infant formula	The World Health Organization (WHO) recommends that water used to reconstitute powdered infant formula (PIF) is ≥70°C to eliminate harmful bacteria, such as *Cronobacter sakazakii*. As collaborators for the preparation of this document, the FSAI guidance note on Information Relevant to the Development of Guidance Material for the Safe Feeding of Reconstituted Powdered Infant Formula is in line with the WHO recommendations.	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	The WHO guidelines describe concerns over the use of very hot water in PIF reconstitution, due to loss of heat sensitive nutrients. A study presented at a 2006 FAO/WHO expert meeting indicated that reduction in vitamin levels from use of water at >70 °C was not significant. However, agreements were not made for specific recommendations on the issue, as the data was based on a single study only. Since the publication of these guidelines in 2007, there has been an increase in the use and availability of automated powdered infant formula preparation machines. The WHO guidelines did not consider the impact of the preparation machines on the potential degradation of heat-sensitive nutrients, including vitamin C. Therefore, further research is needed to investigate the nutrient degradation of heat-sensitive nutrients when using automated formula preparation machines. This research could identify potential considerations that need to be made to ensure compliance with the compositional requirements for infant formula when using PIF preparation machines. These composition requirements are set out in Commission Delegated Regulation (EU) 2016/127, as given effect by the EU (Food Intended for Infants and Young Children, Food for Special Medical Purposes, and Total Diet Replacement for Weight Control) Regulations 2019 (S.I. No. 425 of 2019) as amended by S.I. No. 490 of 2023. Infants are a vulnerable group who depend on	

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	these breastmilk substitutes when they cannot be breastfed, and ensuring their nutritional needs are met by these products is of significant public health importance.	
Botanicals and Nutrivigilance	Botanicals and derived preparations made from plants, algae, fungi or lichens have become widely available on the EU market in the form of food supplements. These products can be bought over the counter in health food stores, pharmacies and over the internet. While many of these products have a long history of use, there may be concerns over the safety of some plant preparations and the substances associated with them. EFSA has created a compendium of botanicals which is updated regularly and collates information on possible adverse effects along with botanical consumption. The adverse reaction events which form the basis of this compendium are not effectively monitored or recorded in Ireland. The creation of a database of adverse effects would help inform decisions on safety and quality criteria of botanical food supplements. The setting-up of a nutrivigilance system which records these adverse effects may allow for swift responses to increases in consumption of food supplements which may cause harm. Supplementary work could involve gathering of information of the prevalence of botanical food supplements on the market, which could	None identified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	inform of the likelihood of issues occurring when particular botanicals are identified as substances of concern, at national or EU level.	
Bezoars and nutrivigilance	Adverse reaction events caused by nutrients in foods are not formally recorded in Ireland via a nutrivigilance system. Between 2009 and 2024 The French authority ANSES (Agency for Food, Environmental and Occupational Health & Safety) via their nutriviligance system, have recorded 11 cases of severity level 3 and above* of bezoar formation in patients consuming two enteral nutrition (EN) products on the French market. These findings led ANSES to alert Healthcare Professionals (HCPs) of the risk of bezoar formation in patients with slowed digestive transit when taking EN. The setting-up of a nutrivigilance system in Ireland would: • allow greater visibility of these adverse events & increase the safety of patients using these products. • inform the need for EN manufacturers to conduct studies to investigate bezoars formation by their products, particularly drug interactions commonly used by enterally fed patients.	None identified.

Social science

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
Food safety culture	Self-regulation is the norm in many industries, e.g. financial, electronics, pharmacological sectors, where potential consumer harm is managed by the company's own compliance reviews. The paradigm of the regulator and the regulated in food safety compliance sometimes tends towards a very different culture of food safety arising from compulsion as opposed to choice. EU food safety legislation on official controls now requires an assessment of food safety culture in food businesses. This requires food businesses to consider what their food safety culture is and how to embed it into their business so that it can be verified by regulators. Research into the marked-difference in safety assurance cultures across different industrial sectors, may yield insight to culture-forming initiatives transferrable from non-food sectors to food production. Research needs include: • Research safety assurance cultures in other industries e.g., pharmaceutical, to gain insight into initiatives that could be adopted/adapted by the food industry to strengthen food safety culture.	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• Investigate behavioural and leadership drivers within food production which support an explicit culture of food safety as a priority. Conversely identify potential impediments which might increase the risk of food safety culture being sub-optimal. • Identify practical interventions which can be applied to drive an ethos of food safety culture in food businesses. • For the purposes of official controls of adequate compliance with legal obligations, identify tangible indices of adequate food safety culture and early-warning indicators of poor food safety culture that could be used to verify compliance.	
Food operation expansion risk assessment	An anecdotal contributor to food safety issues is any rapid expansion of food production volume or complexity. Increased commercial output can stretch physical structures and assurance systems designed for much more moderate operations. Raw material diversity, new processes, new equipment, when imposed on pre-existing structures and systems have potential to detract from food safety risk management effectiveness. Research is needed to identify drivers related to business expansion that result in increasing food safety risks. This work could include: • Economic drivers	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• Physical drivers • Behavioural drivers. Ideally a set of early indicators would be beneficial to identify when food safety is becoming compromised so proactive action can be taken to protect public health.	
Investigating levers to stimulate the reduction of salt, saturated fat, sugar, and calories in food	The reduction of nutrients of public health concern such as salt, saturated fat, sugar, and energy (calories) is a priority to address the rise in food-related ill health. Levers such as fiscal policies, front of pack nutrition labelling and restrictions on advertising to children have been shown to stimulate the reduction of nutrients of public health concern in the food supply. This research project would inform the degree to which mandatory measures stimulate food reformulation and identify the factors that influence the level of reformulation achieved. This research could also explore the health equity of mandatory levers for food reformulation.	**1. Fiscal and pricing policies related to food and non-alcoholic drinks** **Lead**: Safefood. **Funded**: Safeood **Year**: 2023 **Report available:** Here.
Cultural and generational influences on food safety practices, beliefs, and behaviours	Cultural norms and generational differences play a significant role in shaping what is considered important when it comes to food safety. For example, in some cultures, traditional food preparation methods may emphasise practices that minimize perceived risks, while others may focus more on efficiency and convenience, potentially overlooking	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	safety concerns. What is salient across different cultures and generations may also differ. Consumers from different cultures or age groups may prioritize different food safety aspects, such as cleanliness, popularity, or convenience, based on their own experiences and socialisation. Furthermore, research is needed to explore how consumers make decisions regarding food safety, including the role of perceived risks, trust in food sources, and how personal and cultural values influence these choices. Risk perception is particularly variable, with some populations viewing food safety risks as more significant or imminent than others, often influenced by past foodborne illness experiences or (social) media exposure. Cultural practices and beliefs can also shape consumers' attitudes toward food safety, often leading to contrasting views and behaviours across regions, generations, and cultural groups. Understanding these dynamics can help develop more effective, culturally tailored food safety interventions that resonate with diverse consumer groups and promote better practices. Areas for research include: • Cultural norms that either promote or discourage certain food safety practices (e.g. how foods are handled in different	

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	regions or countries, or how food safety is viewed in different social situations). • Influence of traditions and social food practices on behaviours (e.g. how social media influencers or food business social accounts may alter generational views of food safety or what is acceptable). • Understanding cultural or generational resistance to adopting certain food safety guidelines, even if they are scientifically supported (e.g. Gen X perception on 'best before' and 'use by' date).	
Food safety inspector behaviour	A key area for research in food safety involves understanding the behaviour and decision-making processes of food safety inspectors undertaking official controls, particularly the factors that drive what they prioritize during inspections. Inspectors often face a complex set of variables when determining what to focus on, influenced by their training, experience, and personal judgment, as well as external pressures like time constraints and regulatory requirements. Understanding what inspectors perceive as the 'right' things to look at or give more weight to during an inspection - whether it's physical hazards, hygiene practices, or food handling techniques - can shed light on the efficacy of current inspection protocols. Despite robust	None notified.

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	training and experience, humans are fallible and will be influenced by numerous factors (for example: what everyone's brain finds salient will differ. Brains are filters, meant to determine what to focus on and importantly what not to focus on – everyone will naturally give more weight to some areas). Even the best inspector will naturally focus or see one thing more prominently over others due to the way our brain functions. Factors like time will differently impact each inspection process. Additionally, as technology changes all the current indicators may not directly correlate with actual food safety hazards. By investigating these drivers, we can identify potential gaps in inspector training, improve the alignment of inspection practices with the most critical food safety threats, and ultimately enhance the overall effectiveness of food safety regulation. Research should include: • What factors influence food safety inspectors' decision-making when prioritising what to inspect during an evaluation? This research could examine how contextual pressures affect their choices of inspection focus. • How does experience alter what drives an inspection?	

Research area	Research need	Relevant Irish research projects in progress or completed since 2010 that the FSAI is aware of
	• How might time constraints change the flow of an inspection? • How does changing technology impact the efficiency of currently protocols and drivers?	

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