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2025 EFSA Annual Report

Emerging Risks and Horizon Scanning Activities

European Food Safety Authority (EFSA)

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Abstract

In 2025, the European Food Safety Authority (EFSA) further strengthened its capacity to anticipate and respond to emerging risks in food safety through an integrated system combining emerging risk identification and horizon scanning. This annual report presents the outcomes of these activities, highlighting the role of collaborative networks, data-driven methodologies and foresight approaches in supporting preparedness and strategic decision-making. A total of 55 topics were considered, of which 43 were analysed in depth and 25 characterised through structured assessment processes involving the Emerging Risks Exchange Network and the Stakeholder Discussion Group on Emerging Risks. Four issues were identified as emerging risks, while several others required further information, reflecting early signal uncertainty and the need for continued monitoring and research. Contaminants and biological hazards accounted for the largest share of identified concerns, confirming ongoing pressures in these domains. Horizon scanning activities complemented this work by identifying broader drivers, trends and weak signals, including technological innovations, environmental changes and geopolitical developments. External reports and multi-agency collaborations contributed to the identification of signals relevant to EFSA's mandate, supporting a forward-looking approach to risk analysis and policy preparedness. Throughout 2025, EFSA reinforced its collaborative approach, engaging with EU agencies, international organisations and Member States, and contributing to major initiatives such as interagency horizon scanning exercises and the European Commission Strategic Foresight Report. The establishment of the EU Early Warning System for emerging chemical risks marked a key milestone in enhancing inter-institutional coordination and data sharing. Overall, the report demonstrates EFSA's increasing maturity in anticipatory governance, combining scientific expertise, network-based intelligence and foresight methodologies. This integrated approach supports the EU's capacity to address complex and evolving food safety challenges and ensures that EFSA remains responsive to emerging risks and future uncertainties.



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1 Introduction

The European Food Safety Authority (EFSA), in line with Articles 23 and 34 of Regulation (EC) No. 178/2002/EC, actively identifies and defines emerging risks within its remit, consulting experts to develop practical approaches for their detection and assessment.

EFSA's Strategy 2027 aims to 'Ensure preparedness for future risk analysis needs' by identifying emerging risks and future challenges related to food, feed, animal and plant health, including environmental factors. To stay effective, EFSA strengthens foresight and horizon-scanning through global collaboration, engaging staff, EU authorities, stakeholders, the European Commission, EU agencies, non-EU regulators, and international bodies such as FAO and WHO, following a One Health approach.

At the start of this report, a section summarises the issues analysed in 2025 under the emerging risk activities (Chapter 2), the second section reports the broader or longer-term issues of possible relevance for EFSA's work programme and/or strategy, explaining how these were analysed and the followed up actions taken (Chapter 3). The third section outlines EFSA's emerging risk identification activities and horizon-scanning projects (Chapter 4 and 5, respectively). The fourth section provides an overview of the emerging risks and horizon-scanning activities from partners to which EFSA has contributed (Chapter 6).

Newsletters are circulated alongside this report. Each issue offers updates on emerging risk identification and horizon-scanning activities at the completion of each analytical cycle and indicate alerts and topics that require more information, opportunities for partnerships, news, publications, and upcoming events.

2 Emerging Risk Analysis

Emerging risk analysis activities are overseen by the Knowledge, Innovation and Partnership Management (KNOW) Unit at EFSA, utilizing two primary knowledge networks: the Emerging Risks Exchange Network (EREN) and the Stakeholder Discussion Group on Emerging Risks (StaDG-ER). Additional details regarding these networks and the workflows for emerging risks and horizon scanning analysis can be found in Appendix A and B of EFSA's 2024 Annual Report on Emerging Risks and Horizon Scanning activities¹.

In 2025, 55 topics were considered and reviewed by EFSA; 43 were taken forward for in-depth analysis, of which 25 were considered relevant and referred to EREN and StaDG-ER for assessment and ultimately characterised as briefing notes (BN). The other topics (not characterised in BN) were addressed through information sharing or exchange of experience in related activities and discussed within the networks to capture relevance for future follow-up or updates.

The assessment criteria are consistent with EFSA's definition and include new hazards, increased or unexpected exposure to known hazards, as well as the effects of susceptibility in different population groups. Emerging risk data are documented in BN case files, and associated metadata informs about their classification and relevance. A synthesis of BN's information is presented in Tables 1-4, which outline topic attribution by EFSA scientific area and outcomes for emerging risks, and indicate when further information is needed. Information on other topics that do not

¹ <https://efsa.onlinelibrary.wiley.com/doi/epdf/10.2903/sp.efsa.2025.EN-9475>

result in BNs is collected in Table 5. These summaries reflect the perspectives of EREN and/or StaDG-ER network discussions, rather than constituting an official view or position of EFSA.

The four emerging risks identified in 2025 were related to contaminants, with two cases, alongside one case involving a biological hazard and one case concerning a food packaging material (see Figure 1).

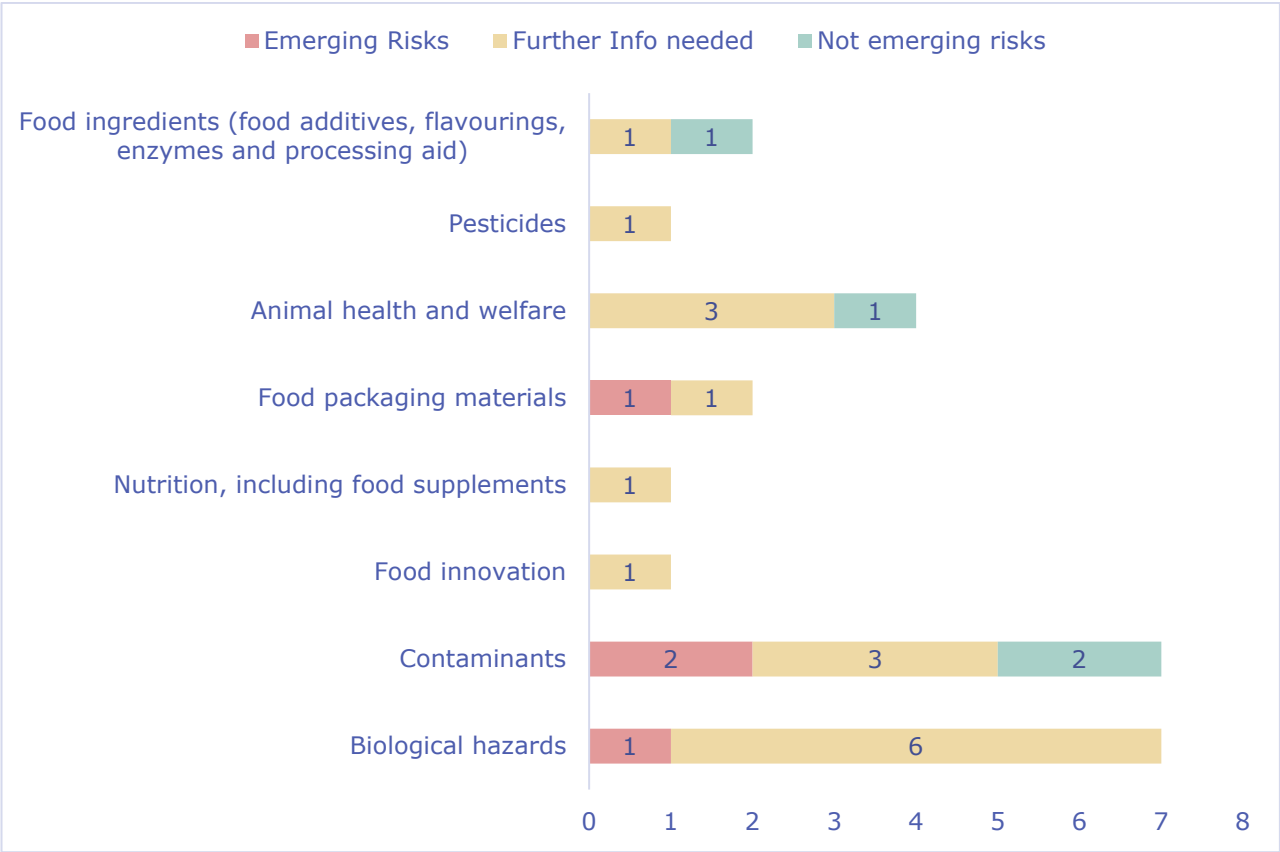


Figure 1: Identified emerging risk categories by EFSA’s scientific areas in 2025

In more details, Table 1 provides an overview of the issues analysed per scientific area, with the conclusion of EREN and StaDG-ER on their emerging risk category. When the issues were allocated to more than one scientific area, only the main one (indicated in bold in Tables 2, 3 and 4) was considered for the classification in Figure 1 and Table 1. Links embedded in the title of the issues will bring the reader to Tables 2 (issues concluded to be emerging risks), 3 (issues requiring further information to conclude) and 4 (issues concluded not to be emerging risks) where the issues and the outcome of their assessment are further detailed.

Table 1: Emerging issues analysed by EFSA in 2025 and organised by scientific area

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Scientific area	Emerging risk category	Issue
Food ingredients	Further information needed	Edible food coatings
	Not emerging risk	Sugar and sugar-sweetened beverages in relation to premature aging in adult survivors of childhood cancer
Pesticides	Further information needed	Chloropicrin, a banned chemical with agricultural fumigant properties
Animal health and welfare	Further information needed	Oropouche Virus: A Potentially Emerging Risk for Europe Human infection with type 1 avian paramyxoviruses (APMV 1): is it an underrated zoonotic risk? Spread of <i>Lagocephalus sceleratus</i> (Pufferfish): Ecological, Economic, and Public Health Implications
	Not emerging risk	Leishmaniasis: Is It Spreading Northward (experience from Bulgaria)?
Food packaging materials	Emerging risk	Increased use of bio-based and biodegradable materials to manufacture Food Contact Materials: Contaminants and Concerns
	Further information needed	Carbon dots and their food applications
Nutrition, including food supplements	Further information needed	Inorganic arsenic in plant-based alternatives to dairy or meat
Food innovation	Further information needed	Edible electronics
Contaminants	Emerging risk	Bongkreic acid in fermented foods Illicit use of Cafodos as a fish preservative
	Further information needed	Unanticipated risks: Vertical farming Tralopyril and transformation products in salmon exposed to tralopyril coated net pen Cesium-137 contamination of foods
	Not emerging risks	Milk analogue made from fish (fish milk) Anti-processing trend and impact on contaminants
Biological hazards	Emerging risk	Antiparasitic drug resistance
	Further information needed	Zoonotic potential of <i>Corynebacterium silvaticum</i> and its occurrence in Europe The potential for global spread of <i>Shewanella</i> spp. Streptococcus suis: A Potentially Underreported Emerging Zoonotic Pathogen Probiotics and Antibiotic Resistance: Emerging Risks and Regulatory Challenges Foodborne outbreaks associated with the use of <i>Bacillus</i> spp. as agricultural biocontrol agents – recent outbreak linked to <i>B. velezensis</i> Foodborne diseases caused by <i>Klebsiella</i> spp.

Table 2: Issues concluded to be Emerging Risks

Antiparasitic drug resistance

Multidrug resistance in soil-transmitted helminths (STHs) on farms is linked to climate change, excessive use of anthelmintics, and poor grazing management. FAO reports economic losses in livestock dependent low-income countries, while scientists warn co-selection risks from nanoparticle alternatives and their environmental persistence.

Author	Classification	Assessment	Results & Recommendations
33 rd EREN BVL, Germany	Animal health and welfare; Biological hazards; Contaminants	Known hazard with unexpected or increased exposure	The environmental initiatives promote residue monitoring and research on non-chemical alternatives, such as biological controls and bioactive forage crops. The EU PARC's ² chemical risk agenda should include antiparasitic resistance data, with a focus on environmental persistence.

Bongkreik acid in fermented foods

A fatal poisoning case in North America from homemade fermented corn highlighted *Burkholderia gladioli* toxin dangers, exacerbated by warmer conditions. Network discussions have supported the warning about home fermentation safety also in Europe alongside diagnostic challenges if relying on sensory inspection alone at the production but also for detecting illness appearing long after consumption.

Author	Classification	Assessment	Results & Recommendations
33 rd EREN FSAI, Ireland	Contaminants Biological hazards;	Known hazard with unexpected or increased exposure	The network experts highlight the importance of public awareness campaigns, clinician training, and monitoring for such cases in Europe.

Increased use of bio-based and biodegradable materials to manufacture Food Contact Materials (FCMs): Contaminants and Concerns

An increased use of bio-based, biodegradable, and other natural-origin materials in food contact applications may alter exposure patterns and pose challenges for risk assessment. These materials may introduce hazardous chemicals such as contaminants (including environmental ones), pesticides residues, allergens, and complex mixtures with uncertain characterisation/specification and migration potential.

Author	Classification	Assessment	Results & Recommendations
33 rd EREN FSAI, Ireland	Food Contact Materials (FCMs) Contaminants	Known hazard with unexpected or increased exposure	This issue is relevant from an emerging risk identification perspective, as the risks associated with natural-origin materials arise from evolving compositions and uses, while experience in risk assessment remains limited and rules for verification of compliance are underdeveloped causing challenges to enforcement. Particular attention may be needed to ensure that these risks are adequately assessed, in line with existing regulatory requirements and EFSA's Technical Report on the safety assessment of mixtures of natural origin used in food contact materials.

Illicit use of Cafodos as a fish preservative

Cafodos (sodium citrate + hydrogen peroxide) masks fish spoilage by preserving appearance, enabling the sale of histamine-contaminated products. An outbreak several years in the past linked to adulterated anchovies highlighted detection challenges due to the rapid decomposition of the compound. illicit use is therefore difficult to detect. However, new methods (e.g. multi-omics approaches, Raman spectroscopy, near infrared (NIR) spectroscopy) are being developed to identify proteolytic changes and may bring to the light more cases of adulteration.

Author	Classification	Assessment	Results & Recommendations
33 rd EREN BVL, Germany	Contaminants	Known hazard with unexpected or increased exposure	Foreseeing practical utilisation of the new methods to identify proteolytic changes and enhanced histamine monitoring support the identification of suspicious cases of adulteration. The issue was brought to the attention of the EU Food Fraud Network for possible follow up, such

² Partnership for the Assessment of Risks from Chemicals <https://www.eu-parc.eu/>

			as, targeted inspections of high-risk seafood supply chains.
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Table 3: Issues for which more information is needed

Zoonotic potential of <i>Corynebacterium silvaticum</i> and its occurrence in Europe Experts in the networks examined the zoonotic potential of <i>Corynebacterium silvaticum</i> , a newly described member of the <i>C. diphtheriae</i> complex detected in wildlife and domestic pigs across several European countries. Some strains can produce diphtheria toxin, and two human infections in Germany—both involving lymphadenitis with abscesses—were reported, raising occupational exposure concerns. However, the true magnitude of human risk and the possibility of foodborne transmission remain unclear due to limited data. Although the case may be an early signal warranting attention, the evidence is too limited and uncertain to categorise it.			
Author	Classification	Assessment	Results & Recommendations
34th EREN BVL, Germany	Animal health and welfare; Biological hazards	Further information needed	Further information from surveillance and targeted studies are needed to clarify the zoonotic and foodborne potential of <i>C. silvaticum</i> within the EU food safety framework as its magnitude in terms of human infection remains limited.
Unanticipated risks: Vertical farming Vertical farming systems enable efficient food production in limited spaces, particularly for leafy vegetables, herbs and microgreens, while supporting resource efficiency and local supply. Although food safety hazards in such controlled environments are generally well understood and managed, an investigation in Singapore identified an unexpected risk following the detection of elevated mercury levels on fresh produce. The source was traced to mercury vapour released from a polyurethane coating used on LED lighting, which accumulated on the crops, highlighting the need to consider non-traditional contamination sources in emerging production systems.			
Author	Classification	Assessment	Results & Recommendations
33 rd StaDG-ER PHF Science, New Zealand	Contaminants	Further information needed	This issue is classified as "Further Information Needed", with potential wider relevance, advising revised HACCP protocols for indoor farms, EU-wide LED material standards, and comparative studies on contaminant levels in vertical farming vs. soil-based agriculture.
Tralopyril and transformation products in salmon exposed to tralopyril coated net pen A presentation highlighted concerns over tralopyril, a copper oxide substitute used in aquaculture nets, due to its bioaccumulation in salmon tissues (muscle, liver) and the detection of its metabolite (2-(4-chlorophenyl)-5-hydroxy-4-oxo-5-(trifluoromethyl)-4,5-dihydro-1H-pyrrole-3-carbonitrile (HTFCCP)) in fish faeces. While tralopyril degrades rapidly in seawater, residues persist in fish, raising food safety questions. Studies cited endocrine disruption and oxidative stress in turbot, though human toxicity data remain limited. Norway announced plans to test 50 salmon samples from farms using tralopyrilcoated nets.			
Author	Classification	Assessment	Results & Recommendations
33 rd EREN DDFS, Hungary	Contaminants	Further information needed	The issue is classified as "Further Information Needed", considering the insufficient information for establishing a maximum residue limit for tralopyril. The issue will be reconsidered after Norway has concluded its study.
The potential for global spread of <i>Shewanella</i> spp. <i>Shewanella</i> spp. are opportunistic pathogens increasingly found in water and seafood; isolated cases of human infection were reported but with limited evidence of foodborne outbreaks. Concerns were raised about their adaptability, antimicrobial resistance, and the impact of global seafood trade and climate change on their spread.			
Author	Classification	Assessment	Results & Recommendations

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33 rd StaDG-ER PHF Science, New Zealand	Biological hazards	Further information needed	Data gaps remain substantial, especially in Europe and therefore "further information is needed" to clarify <i>Shewanella</i> spp. prevalence and their public health and food safety risks. Future research should focus on: - Transmission pathways across environmental, animal, food, and human interfaces. - Environmental and climate drivers affecting persistence, spread and outbreaks. - Occurrence in freshwater aquaculture systems. - Antimicrobial resistance profiles, using enhanced monitoring and genomic analysis, to better understand strain diversity, virulence and dissemination.
Streptococcus suis: A Potentially Underreported Emerging Zoonotic Pathogen A recent study highlights the high prevalence of <i>S. suis</i> in raw pork and pig organs in Southeast Asia. In some cases, antimicrobial resistance or unknown infection pathways complicate treatment, prompting calls for better diagnostics and monitoring. Case reports indicate that the number of infections is most likely underreported due to inadequate surveillance. While Southeast Asia faces high prevalence due to traditional raw pork dishes, European cases are rare and mostly occupational. Therefore, pig farmers, butchers, hunters and other professions working in direct contact with pigs are seen as at risk population and potential sentinels for early signals of exposure.			
Author	Classification	Assessment	Results & Recommendations
33 rd EREN BVL, Germany	Biological hazards	Further information needed	Further information is needed to support eventual risk assessment. This includes improved monitoring or targeted research to clarify prevalence in pig populations and human cases (including antimicrobial-resistant strains), better data on foodborne versus occupational transmission, especially in Europe, and evidence on the relevance and consumption trend of raw (and potentially fermented) pork.
Spread of <i>Lagocephalus sceleratus</i> (Pufferfish): Ecological, Economic, and Public Health Implications <i>Lagocephalus sceleratus</i> , an invasive pufferfish species, is rapidly spreading in Mediterranean and adjacent waters. Known for its potent tetrodotoxin, this species poses significant risks to human health if consumed, as well as ecological and economic threats to local fisheries.			
Author	Classification	Assessment	Results & Recommendations
34 th EREN DDFS, Hungary	Animal health and welfare	Further information needed	Further information is needed regarding occasional exposure or accidental consumption of fish, particularly in relation to tetrodotoxin and the risk of poisoning incidents, as well as updates on potential spread of these fish-hazards. The networks highlighted the importance of public education campaigns, especially those connected to handling and sale measures for pufferfish. Additionally, an enhanced cross-border cooperation can mitigate the ecological and public health risks associated with <i>Lagocephalus sceleratus</i> .
Probiotics and Antibiotic Resistance: Emerging Risks and Regulatory Challenges Some emerging concerns were presented surrounding the use of probiotics in food and feed, focusing on their potential to contribute to the spread of antimicrobial resistance (AMR). The rapid expansion of probiotic food supplements, in the absence of harmonised safety assessment and resistance screening, alongside evidence that some strains may carry transferable AMR genes, raises rational questions about their potential role in AMR dissemination through the food chain.			
Author	Classification	Assessment	Results & Recommendations
34 th EREN	Biological hazards;	Further information needed	Further information is needed, pending additional data on probiotic food supplements

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BVL, Germany	Nutrition (incl. food supplements)		containing antimicrobial resistance (AMR) transferable genes. The discussion acknowledged the variability of the strains used across products and the lack of centralized safety assessment. Implementing harmonized screening processes to monitor and characterise the presence of transferable resistance genes in probiotic strains may support more consistent oversight and provide a stronger evidence base for risk assessment.
Oropouche Virus: A Potentially Emerging Risk for Europe Oropouche virus (OROV), previously confined to the Amazon River Basin, is now spreading across South America and the Caribbean, with imported cases detected in Europe in 2024 and 2025. New findings show that the mosquito <i>Aedes albopictus</i> in southern Europe can transmit OROV under certain conditions.			
Author	Classification	Assessment	Results & Recommendations
34 th EREN BVL, Germany	Animal health and welfare; Biological hazards	Further information needed	Further information is needed to strengthen diagnostics, increase clinician awareness, and prepare for risk assessment to evaluate the likelihood of OROV introduction into Europe, alongside establishing consensus on proactive monitoring and international collaboration. As there is currently no evidence of OROV transmission in Europe, the issue lies beyond EFSA's remit and has therefore been referred to the ECDC for further consideration.
Inorganic arsenic in plant-based alternatives to dairy or meat A Finnish study evaluated inorganic arsenic (a known carcinogen) in rice-based drinks. Although measured levels were relatively low (approximately <5–30 µg/kg), concerns were raised for lactose-allergic children who rely heavily on rice products, as rice readily accumulates arsenic and processing does not sufficiently reduce its levels. Using EFSA occurrence data, national consumption estimates and probabilistic modelling, researchers estimated that such exposure could incrementally increase lifetime cancer risk. As a precautionary measure, Finland recommends avoiding rice drinks as a main beverage for children under six years of age, highlighting broader concerns for vulnerable consumers of plant-based alternatives.			
Author	Classification	Assessment	Results & Recommendations
33 rd EREN Ruokavirasto, Finland	Contaminants; Nutrition (incl. food supplements)	Further information needed	Further information is needed to clarify exposure risks from inorganic arsenic in rice-based milk alternatives. More comprehensive data on different plant-based alternatives and additional occurrence data are required to strengthen the exposure assessment. Surveillance, targeted research, and close collaboration with regulatory bodies should continue to ensure consumer safety.
Human infection with type 1 avian paramyxoviruses (APMV 1): is it an underrated zoonotic risk? APMV-1 are widespread pathogenic agents in poultry and wild birds (specifically genotype VI strains are enzootic in wild birds worldwide). These viruses are also known sporadic and usually mild zoonotic agents, but rare severe infections have occurred in exposed immunocompromised patients. The recent co-occurrence of three severe or fatal cases during a short time-lapse in a country is remarkable. Since human infection with APMV-1 lacks distinctive clinical symptoms and is often identified only through metagenomic sequencing, it may be an under-recognised zoonotic risk, especially in people undertaking anti-cancer treatments or experiencing immunosuppression if exposed to the virus.			
Author	Classification	Assessment	Results & Recommendations
34 th EREN ANSES, France	Animal health and welfare	Further information needed	Further information needed because of the diagnostic challenges that might be associated to underreporting of human cases in other countries. Emphasis may need to be placed on Genotype 6 strains linked to severe clinical outcomes. APMV 1 is considered potentially underestimated zoonotic risk, which warrants

			for rising the awareness, targeted surveillance and further research.
Foodborne outbreaks associated with the use of <i>Bacillus</i> spp. as agricultural biocontrol agents – recent outbreak linked to <i>B. velezensis</i> Biological pest control is an important tool for protecting crops from plant pathogens. <i>Bacillus</i> spp. are considered important biocontrol agents in agriculture. However, the safety of certain species has recently been discussed, as their use could lead to potentially enterotoxigenic residues on agricultural produce. Against this background, the EFSA has assessed the public health risk posed by <i>B. thuringiensis</i> in food resulting from its use as a biopesticide, highlighting that a foodborne outbreak in the EU in 2012 was likely caused by <i>B. thuringiensis</i> in lettuce. A recent outbreak of 12 illnesses linked to rope-spoiled cake has implicated <i>B. velezensis</i> , a ubiquitous species with strains used for fermentation culture and plant protection.			
Author	Classification	Assessment	Results & Recommendations
34 th EREN BVL, Germany	Biological hazards; Pesticides;	Further information needed	Further clarification is needed on the <i>B. velezensis</i> strains involved in the 12 illnesses outbreaks. It was clarified that <i>Bacillus</i> species used as biocontrol agents are authorised at strain level. This information is needed to analyse the epidemiological link between the presence of toxins in food and agricultural use, as well as assessing strain-specific toxigenicity and cytotoxicity.
Foodborne diseases caused by <i>Klebsiella</i> spp. Infections caused by bacteria of the genus <i>Klebsiella</i> are mainly associated with nosocomial infections. They are particularly difficult to treat, as almost all representatives of this genus are resistant to most antibiotics. <i>Klebsiella</i> spp. are one of the leading causes of multidrug-resistant infections in humans. They are highly adaptable and ubiquitous in the environment. Traditionally, the food chain has not been considered to be a risk factor for the transmission of <i>Klebsiella</i> . Several studies in the recent past have reported isolation of <i>Klebsiella</i> from food-producing animals and food products, including milk, salads and poultry.			
Author	Classification	Assessment	Results & Recommendations
34 th EREN BVL, Germany	Biological hazards	Further information needed	Further information is needed: A potential One-Health surveillance approach and systematic sampling will offer better understanding on the actual exposure and resistance. An extensive Belgian genomic study may inform future assessments.
Edible food coatings Substances that are safe for consumption and can be applied to the surface of food to improve quality, shelf-life and safety are not new. However, there has been a surge in research into novel edible coatings/films that further enhance these aspects. The use of substances derived from foods or food by-products is common, but research is focused on functionality rather than safety. Safety would need consideration before the coatings are used on traded food.			
Author	Classification	Assessment	Results & Recommendations
33 rd EREN PHF Science, New Zealand	Food ingredients (food additives, flavourings, enzymes and processing aid); Food packaging materials (FPM)	Further information needed	The issue was classified as Further Information Needed, with priority actions including EU-wide migration of substances studies, information sharing with the EFSA Panel on Food Contact Materials (FCM) where novel formulations are involved, and toxicity assessment of nanoscale components.
Edible electronics Edible electronics can be used for medical purposes, to monitor a parameter of interest. Such devices could be also incorporated into food or packaging to provide information on food safety or quality. Edible electronics are typically constructed from food grade materials with a view to ensuring there are no adverse health effects when these are ingested. There is research underway to repurpose food by-products for building the components in edible electronics. The possible toxicity of the parent materials and their degradation products, in both acute and chronic exposure scenarios, is the main food safety concern.			

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Author	Classification	Assessment	Results & Recommendations
33 rd EREN PHF Science, New Zealand	Food innovation (novel food, GMO and food allergens); Food packaging materials (FPM)	Further information needed	Edible electronics are recognized as a new and emerging technology, for which further research is needed. At this stage, they are linked to longer-term developments in the food landscape rather than to short-term risk considerations. The assessment of active and intelligent materials remains on hold until further clarification has been received from the European Commission.
Chloropicrin, a banned chemical with agricultural fumigant properties Chloropicrin, a chemical historically applied as an agricultural fumigant but now widely banned due to its toxicological profile, has been reported in recent intelligence assessments to be employed through artillery shells, drones, and grenades primarily in eastern and southern Ukrainian agricultural regions.			
Author	Classification	Assessment	Results & Recommendations
34 th EREN FSAI, Ireland	Pesticides	Further information needed	The absence of targeted chloropicrin screening in routine import controls creates potential pathways for contaminated products to enter EU markets undetected. The consensus was to categorise the issue as 'further information needed', highlighting significant gaps in surveillance, and questioning whether analytical methods are available. The perspective of this topic is also considered by EEA.
Carbon dots and their food applications Carbon quantum dots (also called nanodots or just dots) have been identified as having potential food applications including bacterial inhibition in packaging and enhancing preservation of fresh fruit and vegetables as part of washable or edible coatings. A quantum dot property, tunable fluorescence, has been touted as a potential mechanism for pathogen detection. Research on carbon dots has largely focussed on the physical and functional characteristics, with little known about what their presence may mean for food safety.			
Author	Classification	Assessment	Results & Recommendations
33 rd StaDG-ER PHF Science, New Zealand	Food packaging materials (FPM)	Further information needed	To date, EFSA has not received any applications for the use carbon dots in food or food contact material. The need for assessments on the environmental impact of carbon dots, including their potential to persist and re-enter the food chain, was emphasised. It will be presented to the nanomaterials working group for further information.
Cesium-137 contamination of foods Cesium-137 (Cs-137) was detected in food products originating from Indonesia following an incident in 2025 involving contaminated scrap metal processed at a smelting facility. The release of radioactive material led to contamination of shrimp and other food commodities intended for export. Cs-137 was identified in shrimp shipments at several US ports, prompting notifications to the International Atomic Energy Agency and subsequent market access denial by US authorities. Although detected levels were below thresholds for acute health effects, precautionary recalls were implemented as some products had already entered the market. Investigations by relevant authorities in Indonesia and the US are ongoing, and information on wider international trade impacts remains limited.			
Author	Classification	Assessment	Results & Recommendations
34 th StaDG-ER PHF Science, New Zealand	Contaminants	Further information needed	The need to strengthen cross-border data sharing and early warning mechanisms related to radioactive contamination in Europe was highlighted. Further information is needed on system(s) in place to monitor possible radioactive contamination of food or feed in absence of nuclear incident.

Table 4: Issues concluded not to be emerging risks

Milk analogue made from fish (fish milk) A milk alternative derived from Indonesian ponyfish (<i>Eleutheronema</i> spp.) has been reported as a potential protein source and would inherently contain fish allergens. While a past study found contaminant levels below EU limits, environmental pollution in source areas (e.g., mercury in Java Sea fisheries) and processing methods (e.g., drying, fermentation) may influence contaminant concentrations. Nutritional composition and allergenicity would require assessment under Novel Food framework.			
Author	Classification	Assessment	Results & Recommendations
33 rd StaDG-ER PHF Science, New Zealand	Contaminants	Not Emerging Risk	Classified as “Not Emerging Risk”, as food entering the EU must comply with existing contaminant limits and allergen labelling requirements. Allergenicity and nutritional aspects would be assessed under the Novel Food Regulation; the key issue as described is compliance rather than lack of regulatory framework.
Sugar and sugar-sweetened beverages (SSB) in relation to premature aging in adult survivors of childhood cancer An observational study of ~3,300 childhood cancer survivors reported associations between higher sugar and SSB intake and greater deficit accumulation index (DAI), used as a proxy for premature aging. Each 25g/1000kcal increase in total sugar intake was associated with ~25% higher odds of medium or high DAI, and nearly half of participants consumed at least one SSB daily. Key limitations include the cross-sectional study design, reliance on self-reported dietary data, and potential confounding from prior cancer treatments.			
Author	Classification	Assessment	Results & Recommendations
33 rd EREN DDFS, Hungary	Food ingredients (food additives, flavourings, enzymes and processing aid)	Not Emerging Risk	While the association between high sugar/SSB intake and accelerated aging was considered biologically plausible (e.g. via oxidative stress and inflammation), the evidence is based on a cross-sectional study in a highly specific population of chemotherapy-treated childhood cancer survivors and is subject to key limitations, including potential treatment-related confounding and reliance on self-reported dietary data. The findings were therefore retained as contextual information, for further comparison as new data emerge.
Leishmaniasis: Is It Spreading Northward (experience from Bulgaria)? The detection of <i>L. infantum</i> (canine leishmaniasis) in the northern/central Bulgarian areas where it was previously unreported, alongside entomological evidence of expanding sand fly presence, suggests a geographic shift in transmission suitability. This pattern is consistent with findings from Italy and Greece projecting northward expansion of vectors and cases, indicating a broader regional trend that motivates continued surveillance and comparative assessment across countries.			
Author	Classification	Assessment	Results & Recommendations
34 th EREN RACFC, Bulgaria	Animal health and welfare; Biological hazards	Not Emerging Risk	Addressed under a wide EU mandate to EFSA on vector-borne diseases including Leishmania ³ .
Anti-processing trend and impact on contaminants An increasing “anti-processing” trend within the European Union, driven by concerns about ultra-processed foods, has raised potential food safety considerations. The example of vegetable oil production was discussed, where refining steps such as bleaching and deodorisation play a critical role in reducing chemical contaminants, including mycotoxins and heavy metals. Evidence indicates that these processes are effective in mitigating hazards such as <i>Alternaria</i> toxins and nickel. Challenges remain in addressing consumer misperceptions and the lack of clear, harmonised definitions of “ultra-processed foods”, which may influence attitudes towards essential food safety practices.			

³ Vector Borne Disease (VBD) - Risk posed by VBDs: mitigation measures:
<https://open.efsa.europa.eu/questions/EFSA-Q-2025-00186?search=EFSA-Q-2025-00186>

Author	Classification	Assessment	Results & Recommendations
34 th StaDG-ER FEDIOL	Contaminants	Not Emerging Risk	The topic was considered a general trend rather than a specific risk. For this reason, it was classified as a non-emerging risk. However, the need for clear, science-based communication to explain the role of food processing in food safety was highlighted, as well as the need for clarifying and harmonising the definitions of food processing categories.

In addition, 30 topics (Table 5) were also screened by EFSA following their identification through different channels and at different points in time, including suggestions from EREN and the StaDG-ER, as well as through targeted scanning of news sources and scientific publications. After a pre-assessment of their relevance, these topics were not taken forward for the development of a Briefing Note. Some of the topics were identified too late so further analysis and a briefing note may be considered in 2026 while in other cases the issues were assessed as broader in nature and therefore more appropriately addressed through the horizon scanning workflow. Additional information is provided in the "Description/Comments" column of the table; where indicated, further details can be found in the minutes of previous EREN or StaDG-ER meetings when the topic had already been discussed.

Table 5: Other topics suggested or discussed by Knowledge Networks but not prioritised for further emerging risk analysis and not resulting in new Briefing Notes, but listed for possible future consideration

Title	Comments
Food ingredients (food additives, flavourings, enzymes and processing aid)	
Heat-induced substances in fatty fried food as triggering stimuli to immune system interplay in global autoimmune diseases	It is difficult to attribute the referred effect to a specific emerging risk. Multifactorial issues are combined under the umbrella of Western style diets and connected with the reported global trend of rising level of fried/fatty foods consumption. It was not prioritised for further emerging risk analysis. A driver–impact analyses of food choice trends could be relevant for future long term considerations.
Herbal preparations containing the ingredient Tongkat-Ali	EFSA in 2021 has concluded that safety could not be established due to genotoxicity concerns. The suggested issue was not prioritised for further emerging risk analysis, but it is of potential relevance for food fraud and market surveillance activities.
Risk of capsaicin	The information relates to a recall for noodles due to high capsaicin levels. The new information aligns with a similar note from 2024. The issue is not prioritised for further emerging risk analysis as EFSA has conducted assessments and provided scientific opinions on capsaicin in 2025.
Neuroactive Compounds	There is an increasing use of neuroactive compounds in food and food supplements marketed for mental health benefits; this issue was suggested to be considered in a broader one-health approach, together with EMA and EUDA.
Feed	
Fish Sludge as Feed in Circular Bioproduction	The item concerns the potential use of fish sludge from salmonid aquaculture as a substrate for insect-based feed production within circular bioproduction systems, It was not prioritised for further emerging risk analysis, due to limited evidence and significant uncertainties regarding chemical hazards and organic contaminants.

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	The use of fish sludge for feed purpose is currently forbidden in the EU. It is considered under EFSA horizon scanning activities.
Pesticides	
Pesticides banned in the EU: implications for trade and border controls.	The information relates to policies on banned pesticides in the EU and the effectiveness of border controls in preventing the presence of non-authorised residues in imported food, rather than to the identification of a specific emerging risk. It was therefore not further analysed.
Findings of TFA in food and groundwater	The item provides updates on findings of trifluoroacetic acid (TFA), previously identified as an emerging risk in the 2024 report. Following a request from the European Commission, EFSA is reviewing the health-based guidance values for trifluoroacetic acid (TFA), a substance that forms during the breakdown of PFAS. EFSA is working on this review in cooperation with the European Chemicals Agency (ECHA) who is responsible for the classification of the chemical properties of TFA.
Study revealed significant pesticide exposure in children aged 6-13 if in proximity to vineyard	The study documents pesticide exposure near agricultural areas and did not indicate acute health effects. It was not prioritised for further emerging risk analysis as this is a risk management issue.
Animal health and welfare	
The Thermal Stability of Highly Pathogenic Avian Influenza (HPAI) H5N1 in raw milk	The emergence of HPAI H5N1 in dairy cattle in the US has raised questions regarding virus survival in raw milk and the effectiveness of thermal treatments. It was not prioritised for further emerging risk analysis, as the situation has been closely monitored by EFSA's Animal Health experts and regular overview reports are published on the web ⁴ .
Authorities Track Animals from Sheep Pox Hotspot Hidden Away by Owners	The information relates to sheep and goat pox outbreaks linked to illegal animal movements and non-compliance with disease control measures, representing a compliance challenge and enforcement issue rather than a specific emerging risk. It was not prioritised for further emerging risk analysis, as the issue is addressed through national control measures and discussions at Standing Committee on Plants, Animals, Food and Feed (PAFF Committee) on animal health risk management and regulatory enforcement.
Intertwined issues of (a) US policy to control H5N1 in poultry and cattle production along with EU concerns about (b) mammalian susceptibility	The issue concerns updates on HPAI H5N1 in poultry and cattle production, including surveillance findings and preparedness measures along with mammalian's susceptibility were discussed at 33 EREN meeting. It was not prioritised for further emerging risk analysis, as EFSA's Animal Health experts closely monitor the situation, including transmission dynamics, surveillance data and preparedness actions in coordination with EU and international partners.
Cattle Abortions and Congenital malformations due to BTV-3 in Southern Belgium 2024	The issue concerns cattle abortions and congenital malformations linked to Bluetongue Virus serotype 3 (BTV-3). It was discussed at 34 EREN meeting, but did not lead to a separate Briefing Note as it relates to an ongoing, monitored outbreak and addressed via established surveillance and cross-border coordination.
Bluetongue Virus (BTV) and Epizootic Haemorrhagic Disease Virus (EHDV): general outlines of the 2023-2024 epidemic	The issue covered general updates on BTV and EHDV outbreaks and vector-borne disease dynamics discussed at the 33 StaDG-ER meeting and did not result in a specific Briefing Note as it relates to known epidemic patterns. It was not prioritised for further emerging risk analysis as BTV and EHDV are addressed through the discussions at PAFF Committee established surveillance and ongoing work on vector-borne diseases in the context of climate change.

⁴ EFSA Avian Influenza: <https://www.efsa.europa.eu/en/topics/topic/avian-influenza>

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Follow up on Veterinary Vaccine Shortage as a driver of Emerging Issues	The issue related to limited availability of veterinary vaccines was discussed at network meeting (33rd StaDG-ER) as a potential driver influencing animal health, food security and antimicrobial use. It was not prioritised for further emerging risk analysis; relevant as contextual information for future horizon-scanning discussions on One Health and drivers, particularly where vaccine shortages may indirectly influence disease control and antibiotic use.
Spread of <i>Tropilaelaps</i> into regions neighbouring the European Union (EU)	The issue concerns the potential spread of <i>Tropilaelaps</i> mites into regions neighbouring the EU, shared under activity monitoring at network meeting (33rd EREN) and although not resulted in Briefing Note as reflected by world animal health organisation monitoring it offers rationales for strengthening early-warning frameworks through integration of <i>Tropilaelaps</i> monitoring into existing pollinator and pest health programmes and promoting knowledge exchange with countries already dealing with infestations.
Examining the international bushmeat traffic	The item discussed at 33rd EREN meeting addresses monitoring of international bushmeat traffic into the EU as a driver for emerging risks. It was not prioritised for further emerging risk analysis; however relevant for risk-management discussions on options to enhance border measures, possible compliance tools and species identification methods.
Risk of Tick-Borne Encephalitis (TBE) in Europe	The issue, discussed at the 33rd StaDG-ER meeting, addressed known drivers such as climate change and ecological shifts and was not further considered for a new Briefing Note, as it mainly provides updates to evidence and conclusions already documented in previous Briefing Notes and is covered under ongoing EFSA work on vector-borne diseases and One Health activities.
Crimean Congo Haemorrhagic Fever (CCHF) potential	Recent epidemiological trends and surveillance data suggest the potential emergence of CCHF in Italy, possibly linked to climate-driven expansion of tick habitats and limited understanding of transmission routes, particularly via migratory birds. The issue, discussed at 34th StaDG-ER meeting, was not prioritised for further emerging risk analysis, as three forthcoming EFSA scientific opinions on vector-borne disease transmission and climate change impacts are due in 2026.
Foot-and-mouth disease (FMD): Two introductions into Europe in 3 months	The issue concerns two independent introductions of foot-and-mouth disease (FMD) into Europe (Germany and Hungary/Slovakia), supported by molecular and epidemiological evidence, while transmission pathways remain inconclusive. Discussed at the 33rd StaDG-ER meeting, it did not result in a Briefing Note as the outbreaks were under active investigation by national authorities and EU mechanisms including PAFF Committee and were addressed through established animal health surveillance and cross-border coordination.
Nutrition, including food supplements	
Food allergy: scientific and psychosocial perspectives	Ongoing work in New Zealand on food allergenicity was presented at the 34th EREN meeting, focusing on immunological aspects, treatments, and psychosocial impacts; it did not constitute a specific emerging risk requiring further analysis. The content served an information-sharing purpose to raise awareness of existing initiatives and support dialogue.
Potential correlation between food additive mixtures and type 2 diabetes	The item refers to findings from a French cohort study suggesting associations between mixtures of food additives in ultra-processed foods and type 2 diabetes risk, while outlining methodological limitations related to confounding and interaction effects. It was discussed at 34 StaDG-ER and not prioritised for further emerging risk analysis, as the study was already known and considered within EFSA's ongoing assessments.
Contaminants	

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Will the EU decrease the permitted levels of mercury in tuna?	The item concerns NGO advocacy claims calling for lower permitted mercury levels in tuna, based on reported exceedances in canned products, but does not represent a new emerging risk and relates primarily to risk management discussions. It was not prioritised for further emerging risk analysis, as the topic is covered under EFSA's recent work on mercury in fish and seafood consumption ⁵ , including EU wide assessments supporting dietary advice and informing ongoing policy discussions on mercury exposure.
Certain chemicals permitted in U.S. foods, but linked to health risks, are banned in Europe due to regulatory differences.	The item highlights differences between US and EU regulatory approaches to food additives, illustrated by media reporting on chemicals permitted in US foods but restricted or banned in the EU, and was considered as a contextual illustration rather than a specific emerging risk. It was not prioritised for further emerging risk analysis, as the issue is primarily related to risk-management, regulatory frameworks and import control enforcement.
Offshore Wind Farms	The item, discussed at the 34th EREN meeting, explored potential implications of offshore wind farm expansion for marine ecosystems and food safety, but did not result in a Briefing Note as evidence remains exploratory and largely focused on knowledge gaps rather than a defined emerging risk. The topic would be relevant for longer-term horizon-scanning and integrated monitoring of environmental and food chain interactions, rather than immediate risk assessment, and may inform future cross-sectoral studies linking renewable energy and food systems.
Microplastic Soil Contamination and Migration through the Food Chain	The item, discussed at the 34th StaDG-ER meeting, referred to recent findings on microplastic contamination in soils and potential migration to the food chain, but did not result in a Briefing Note as the issue is covered by ongoing EFSA work on microplastics, including a recent mandate addressing potential health risks from microplastics in food, water and air, and supports methodological development.
Biological hazards	
The interplay between antimicrobial resistance, heavy metal pollution, and the role of microplastics	The suggested item discusses interactions between antimicrobial resistance, heavy metal pollution and microplastics as environmental drivers of resistance but did not result in a Briefing Note as it reflects well-documented mechanisms and broader trends already addressed in previous network discussions. It was not prioritised for further emerging risk analysis, as antimicrobial resistance and microplastics are covered under EFSA's ongoing One Health and AMR work, and the topic is more relevant for broader contextualisation and longer-term scientific assessment, including EFSA's current mandate to assess potential health risks of microplastics in food, water and air
Potential foodborne transmission of <i>Helicobacter pullorum</i>	The item on potential foodborne transmission of <i>Helicobacter pullorum</i> was reviewed and not taken forward, as no new evidence has emerged since the 2024 analysis to change its status of "further information needed". The topic is already addressed in a prior Briefing Note and reported in the 2024 Annual Report, and current evidence remains insufficient to establish a stronger evidence between poultry products and human disease.
Shiga toxin-producing <i>E. coli</i> (STEC)- increased occurrence – Case study	The item, discussed at the 34th StaDG-ER meeting, presented a case study on increased findings of Shiga toxin-producing <i>E. coli</i> (STEC) in the food supply chain, highlighting uncertainties in company-generated monitoring data and challenges in outbreak source attribution. It was not prioritised for further emerging risk analysis, as STEC is a known hazard addressed through existing monitoring and control frameworks, and the discussion mainly informed methodological improvements, data harmonisation, and collaboration among laboratories and food safety authorities.

⁵ <https://www.efsa.europa.eu/en/news/fish-and-seafood-consumption-eu-awareness-dietary-advice-mercury>

Risks of getting Screwworm in the EU due to climatic changes	The item, discussed at the 34th StaDG-ER meeting, referred on potential risks of Screwworm introduction into the EU driven by climate change and global trade, identifying surveillance, regulatory and ecological knowledge gaps. Further emerging risk analysis is planned, as a dedicated Briefing Note has already been initiated and will be analysed in 2026 to assess biological and geographical risks within broader animal health and climate risk frameworks.
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3 Horizon Scanning

EFSA horizon scanning activities aim at identifying drivers, trends, weak signals, and upcoming policy developments that may affect its capacity to deliver on its mission. This approach, coordinated by the KNOW Unit in collaboration with the Chief Scientist Office and the relevant subject-matter Units, builds on the same collaborative network dedicated to the identification of emerging risks. In addition, a comprehensive review of external reports (Table 6) was conducted to identify issues that merit further analysis.

Table 6: External reports screened to identify potential emerging risks

Source	Title
SAM (2023)	Cross-sectional evidence-based governance for one health in the EU
SAM (2024)	One Health Governance in the European Union
SAPEA (2024)	One Health Governance in the European Union
Ninistö S. (2023)	Safer together – Strengthening Europe’s civilian and military preparedness and readiness
UNEP (2024)	Navigating new horizons – A global foresight report on planetary health and human wellbeing
DG AGRI (2024)	EU Agricultural Outlook 2024-2035
CREME Global (2024)	The 12 evolving global factors affecting food safety into 2025
EFSCM (2024)	State of food security in the EU
EFSCM (2025)	State of the food security in the EU – Spring 2025
FAO (2024)	Agrifood systems in nationally determined contributions: global analysis
JRC (2024)	Risks on the horizon
McKinsey Global Institute (2024)	The next big arenas of competition
JRC (2024)	Trends in the EU bioeconomy - update 2024
WOAH (2024)	100th Anniversary Participatory Foresight Project – WOAHA Change Cards
JRC (2025)	Delivering the EU Green Deal – Progress towards targets
WEF (2025)	The global risks report 2025
Singularity Hub (2025)	Dangerous AI-Designed Proteins Could Evade Today’s Biosecurity Software
EC (2025)	2025 Strategic Foresight Report
EEA (2025)	Europe’s environment and climate: knowledge for resilience, prosperity and sustainability

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ESPAS (2025)	ESPAS Horizon Scanning Signal Cards
StaDG-ER (2025)	Vitamins dependencies
Hackaday (2025)	Could space radiations mutate seeds for the benefit of humanity?
IFPRI (2025)	Food policy – Lessons and priorities for a changing world
JRC (2025)	Poly crisis exploration workshop
CIFS (2025)	Exploring the futures of technology
ECHA (2025)	Key areas of regulatory challenge
Farsight (2025)	Europe's future – Four scenarios for the next decade
OECD (2025)	Strategic foresight – toolkit for resilient public policy
UK DEFRA (2025)	A UK Government food strategy for England, considering the wider UK food system

Table 7 summarises the signals identified from the external reports listed in Table 6 or from the collaborative network interactions, and the outcome of their assessment under the horizon-scanning workflow; see Appendix C of EFSA (2025) for further details on the workflow and the interpretation of the coloured steps.

Table 7: Specific signals screened in the horizon-scanning (HS) workflow

Signal	Epidemic intelligence for animal diseases / zoonoses
Source	EFSA
Description	Epidemic Intelligence from Open Sources (EIOS) integrates data from indicator-based surveillance (IBS) and event-based surveillance (EBS) to facilitate the early detection and verification of health threats, thereby supporting subsequent risk assessment and response measures. This capability is essential for EFSA's horizon scanning activities. EFSA has developed effective systems for monitoring foodborne outbreaks and avian influenza. However, its capacity remains constrained when addressing other animal diseases, such as lumpy skin disease and foot-and-mouth disease, as well as various emerging and re-emerging zoonoses.
Conclusions	The Animal health team has initiated a collaboration with JRC, ECDC, WOA and WHO on the possible use of EIOS, exploring how this platform could be used for monitoring mandates, e.g. on avian influenza and vector-borne diseases, but also to detect (re-) emerging animal diseases and zoonoses.
HS workflow steps and status	STOP –actions are in place
Signal	Toward decarbonisation - Renewables and electrification
Source	EEA (2025), Europe's environment 2025 – Main report
Description	Renewables and electrification are two key components of decarbonisation. While drastically reducing fossil-fuel impacts, the clean-energy transition is linked to a) raw-material extraction, b) waste management and c) releases of chemicals. In relation to raw-material extraction, the transition to renewables will substantially increase demand for critical raw materials (CRMs). Meanwhile, extraction and refining are environmentally intensive and can cause acid mine drainage, radioactive contamination, airborne contaminants and heavy-metal contamination.
Conclusions	Energy-transition materials' life cycles have implications for food and feed safety through soil, water and ecosystem contamination and bioaccumulation in crops and

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	livestock feed. Therefore, follow up has been performed to identify emerging contaminants associated with energy-transition materials and electrification waste in the agri-environment interface, and to assess the future uptake of agrivoltaics practices, incl. energy production from the oceans, and their implications. It was noted that assessing the safety of these contaminants would be work as usual for EFSA, with Regulatory framework and methodological guidance already in place.
HS workflow steps and status	STOP - actions are implemented. 
Signal	Using Air for CO2 Extraction and Utilisation
Source	ESPAS Horizon Scanning – Signal cards
Description	The Earth provides various ecosystem services, but atmospheric services have historically received the least attention. Previously considered less relevant due to their abundance and renewable nature, there is growing recognition of the importance of quality air for breathing, radiation protection, cleansing capacity, warming, direct use, water redistribution, combustion, sound, communication, power, extraction of gases, tourism, and aesthetics. Increased interest in air for CO2 extraction and utilisation (protein, bio-based chemicals), as well as water extraction or hygroelectricity (electricity from humid air), is changing perceptions of air as a resource.
Conclusions	The issue of the use of CO2 for the production of proteins has been captured in an EFSA procurement to map future food innovation technologies and systems in relation to Novel Foods. This signal has also been brought to the attention of EEA for possible follow up.
HS workflow steps and status	STOP - actions are implemented. 
Signal	AI-generated proteins
Source	EFSA
Description	Recent research demonstrates that artificial intelligence (AI) tools can design synthetic proteins that mimic known toxins or viral components while evading current biosecurity screening software. These "AI-designed proteins" represent a dual-use challenge: they could accelerate beneficial innovation in biotechnology but also create new biosecurity vulnerabilities if they are misused or undetected. The rapid convergence of AI and synthetic biology increases the risk of novel bio-engineered proteins entering the food, feed, or animal production chains without being flagged by existing screening mechanisms. This could compromise food safety, animal health, and public trust in emerging biotechnologies.
Conclusions	Absence of methodology to evaluate sequence-function risk when the sequence does not match existing databases. High relevance considering rapid convergence of AI and synthetic biology. While EFSA's guidelines are considered a robust foundation, their application to novel, AI-designed proteins and other SynBio products reveals several areas that are "not fully adequate"; the following gaps were identified: Allergenicity Assessment of New-to-Nature Proteins Toxicological and Production Safety of Xenobionts Nutritional Assessment of Novel Products
HS workflow steps and status	ONGOING – assess possible EU and international collaborations 
Signal	fish sludge as source of phosphorus for feed

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Source	EFSA
Description	Phosphorus is an essential, finite resource classified as a Critical Raw Material by the EU since 2017. Although the European Commission has approved recycled phosphorus for use in organic farming, a decades-old rule still bans its use in animal feed. Since phosphorus recovered from sewage sludge is classified as a Category 1 animal by-product derivative under Regulation (EC) No 1069/2009, this automatically triggers the feed-market ban. However, there is a recent initiative from the Swedish authorities proposing amendments to the EU feed legislation that would allow phosphorus recovered from sewage sludge ash (SSA) to be used as a source of phosphorus in animal feed.
Conclusions	Phosphorus is an essential, finite resource classified as a Critical Raw Material by the EU since 2017. Annex III of Regulation (EC) No 767/2009 prohibits the use in feed of "all waste obtained from the various phases of urban, domestic and industrial wastewater treatment". Should the regulation change, this new production process would have to be assessed by EFSA under Reg. 1831/2003 (authorisation request), and considering also EFSA 2025 opinion on the presence of biological and chemical hazards in ash from Category 1 material after incineration, co-incineration, and combustion.
HS workflow steps and status	STOP –actions are in place 
Signal	FOBO-Fear Of Becoming Obsolete
Source	ESPAS Horizon Scanning – Signal cards
Description	FOBO, or the fear of becoming obsolete, is a growing concern among employees, especially those with a higher education, as emerging technologies threaten to make their skills irrelevant. This fear results in stress, anxiety, and reduced job satisfaction, affecting work-life balance. With the introduction of AI, FOBO is likely to worsen employee burnout. Addressing FOBO is crucial for employee well-being and a positive work environment. Companies must invest in continuous learning and development to prepare employees for technological advancements and reduce FOBO's impact. This enables them to face the future with courage and skills, not fear and ignorance.
Conclusions	No report of anxiety was received so far from staff, probably due to the anticipatory/preventive measures (trainings) to explain that AI is intended to increase performance and facilitate everyday work rather than substituting staff.
HS workflow steps and status	STOP –actions are in place 
Signal	Revised EU waste and packaging legislations
Source	EFSA
Description	The recent revisions of the Packaging and Packaging Waste Directive (PPWD) and the EU Waste Framework Directive (WFD) are designed to reduce packaging and overall waste by encouraging circular practices such as increased recycling and the elimination of harmful substances in food contact materials. While these legislative changes advance the goals of a circular economy, they also introduce new considerations for food and feed safety. Key issues requiring careful assessment include the safety of marine biopolymers, such as those derived from algae, and the presence of non-intentionally added substances resulting from the recycling processes of plastics used in food and feed contact materials. In addition, EFSA's foresight activities on circular feed produced from food waste and former food products highlight the need for vigilant

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	oversight as these innovative practices evolve within a changing regulatory and environmental landscape.
Conclusions	Monitoring of animal feed legislation and sectorial guidance for the assessment of food contact materials are in place. No further action needed.
HS workflow steps and status	STOP - Actions are in place. 
Signal	Food supplements containing plant-based substances with QSAR- predicted toxicity
Source	EFSA
Description	The EFSA Botanicals Compendium contains over 1,000 plant substances that are naturally occurring and considered to be of possible concern for human health, but experimental toxicity data are available for only 415 of them. A QSAR-based approach was used by EFSA to predict most common toxicological endpoints for these substances. EFSA should now consider what weight to give to these predictions in a risk assessment, especially in the absence of experimental data.
Conclusions	The analysis of magnitude of the issue (presence on the market of food supplements containing substances predicted to be toxic) is ongoing, as part of a Focal Point tailor-made activity
HS workflow steps and status	Ongoing – Member States and EFSA characterising the magnitude of the issue 
Signal	Agrobioterrorism and cyber attacks on the food supply chain
Source	EFSA
Description	Agroterrorism involves the intentional release or spread of biological agents aimed at disrupting agricultural systems and food supplies, threatening not only food security but also the health of humans, animals, and plants, as well as the wider economy. These threats can take various forms, including plant-based, animal-based, and food-based attacks. Cyber-attacks, meanwhile, target the technological infrastructure underpinning the food supply chain, seeking to compromise sensitive information, disrupt operations, and inflict financial damage. Methods include malware, phishing, denial of service, man-in-the-middle, cross-site scripting, password breaches, and insider threats. When combined, these risks—termed "Agrobiocyberterrorism"—create significant vulnerabilities across the food supply chain, potentially compromising food safety and environmental health. Members of the EFSA Advisory Forum questioned EFSA's preparedness to this type of events.
Conclusions	The current geopolitical situation has brought the issue of agroterrorism on the front of the scene. The EU's prevention, preparedness, and response plan underscores the need to enhance forecasting and anticipation capabilities, including the development of comprehensive risk and threat assessments at a European level, to prevent crises resulting from both natural disasters and hybrid threats. The issue of agroterrorism leading to a disruption of the food production/distribution in Europe has therefore been selected for the scenario of EFSA's 2026 internal and external crisis exercises.
HS workflow steps and status	STOP – Actions are in place. 
Signal	One-Health Governance in the EU
Source	SAM (2023, 2024), SAPEA (2024)
Description	Transformational change is needed to reflect the interdependence of human, animal, and ecosystem health. This requires cross-sector collaboration to address indirect, long-

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	term policy effects, and stronger ties across all governance levels (regional, national, and international). For effective One Health governance in the EU, it is essential to integrate policies and actions across public health, veterinary, environmental, and agricultural sectors. Such an approach encourages joint problem-solving, shared data, and coordinated strategies to prevent and respond to complex health threats. By fostering communication and cooperation among institutions and stakeholders, the EU can better anticipate emerging risks, promote sustainable development, and safeguard the well-being of people, animals, and the environment.
Conclusions	Already being implemented through the Cross-agencies Task Force on One-Health and the dedicated EFSA Task Force on One-Health, ensuring collaborative action and alignment across multiple agencies and internal teams.
HS workflow steps and status	STOP - Actions are in place 
Signal	Agroclimate zones shifting North
Source	EFSA
Description	Climate change will force shifts in agriculture to manage mycotoxin risks. Southern Europe may become unsuitable for crops like maize, while northern regions may gain suitability for new crops.
Conclusions	The Preparedness Council has already evaluated and reported on the increased pressure of mycotoxins and the challenge of antifungal resistance. A significant portion of the Research budget has already been allocated to address anti-microbial resistance at large, which also covers antifungal resistance.
HS workflow steps and status	STOP - Actions are in place. 
Signal	Carbon Offsetting
Source	UNEP (2024)
Description	Carbon offsetting schemes are becoming increasingly prevalent, but concerns are rising about the legitimacy and effectiveness of many programs. Some initiatives exaggerate their contribution to emissions reduction, leading to doubts about their real environmental impact. In addition, afforestation efforts often rely on non-endemic monocultures, with the risk of introducing alien (often invasive) species that may undermine ecosystems health.
Conclusions	The issue was brought to the EFSA 3 rd International scientific workshop on Horizon scanning for Plant Health, illustrating a possible driver justifying the development of a global horizon scanning system (see section 5.2).
HS workflow steps and status	STOP - Actions are in place 
Signal	Environmental pollution and increase of zoonoses
Source	WOAH Change Cards
Description	Air and microplastic pollution has been linked to the development and spread of antimicrobial resistance, which poses significant risks to both animal and human health. Such pollution can facilitate the emergence and transmission of zoonotic diseases—illnesses that pass from animals to humans—by compromising immune defenses and increasing pathogen exposure. Consequently, rising environmental contamination underscores the need for a more comprehensive assessment of agriculture's role in exacerbating these risks and its broader impact on ecosystem and public health.

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Conclusions	EFSA has established robust mechanisms for monitoring foodborne outbreaks and avian influenza, but has more limited capacity for other animal diseases and (re-)emerging zoonoses. The integration of epidemic intelligence in the animal health area in progress with a collaboration initiated with JRC, ECDC, WOA and WHO on the use of EIOS (Epidemic Intelligence from Open Sources). EFSA is also conducting a comprehensive scientific assessment of the potential health risks of microplastics in food, water, and air, with results expected by the end of 2027. The opinion will also address the issue of microplastics pollution and antimicrobial resistance.
HS workflow steps and status	STOP - Actions are in place 
Signal	Warfare-related contaminants
Source	EFSA
Description	chemicals used in warfare operations (see emerging issue on chloropicrin), collapsed buildings releasing hazardous material such as asbestos), or radioactivity that could be released from nuclear weapons or damaged nuclear plants can contaminate soils and groundwater in the long term, and consequently food systems.
Conclusions	Accidental radioactive contamination is addressed in Art. 31 of EURATOM Treaty. EFSA has no active role in this area, unless requested. The assessment of warfare-related chemical contaminants would be work as usual, using existing regulatory framework and guidance in place.
HS workflow steps and status	STOP – no further action needed 

Additional topics emerged during the horizon screening process; however, following a preliminary assessment, they were not prioritized for further analysis and are instead listed in Table 8 for reference.

Table 8: Other topics not prioritised for horizon scanning analysis

Title	Comments
Green chemistry	Compounds for food production, including packaging and preservatives, derived from green chemistry would be subject to safety assessments under existing sector-specific regulations; therefore, no further analysis is required here.
Organics and sustainability	The organic farming practices are referred in Regulation (EU) 2018/848, strengthening compliance rules and risk-based controls across the organic supply chain, addressing potential safety concerns within existing frameworks.
GLP-1 agonist drugs	GLP-1 agonist medicines fall outside EFSA's remit, and 'GLP-1-friendly' food products were not prioritised as such labelling is not permitted under existing EU rules."
Back to meat	Signals indicating a renewed consumer preference for conventional animal meat over alternative proteins were not prioritised, as such reverse in consumer's choice has no implications for EFSA's strategic mandate or activities.
Veterinary medicines and edible insects	Issues related to veterinary medicinal products fall under European Medical Agency's remit and eventual food safety risks in edible insects are addressed through the EU Novel Food framework
Neurodiversity in EFSA	Neurodiversity (recognising differences in learning, mood, attention, sociability, and other mental functions) is reflected in inclusion policies

	and talent management practices under the remit of human resources.
Digital market and risk assessment	Developments related to digital food markets and AI-driven nutrition were not prioritised, as current exposure assessment approaches do not distinguish digital supply chains and related aspects are either addressed through existing data frameworks or fall under Member State competences, with no immediate implications for EFSA activities.
Space mutagenesis	Space mutagenesis for crop development was identified through horizon scanning but not prioritised due to its early stage of development, as resulting products are expected to fall under existing EU frameworks for plant breeding and novel food/GMO assessment, with no immediate implications for EFSA activities.
Critical raw materials dependency	EU dependency on critical raw materials for food/ feed additives (e.g. vitamins and amino acids) was not prioritised for actions from EFSA, as existing regulatory frameworks address safety aspects, although continued monitoring and stakeholder engagement are important given potential supply chain vulnerabilities.'
Electrically conductive substrate for boosting plant growth	Electrically conductive substrates for enhancing plant growth were identified at an early-stage production technology with potential applications addressed within existing plant science and environmental assessment frameworks, with no immediate implications for EFSA activities.

4 EFSA Emerging Risk Identification projects

4.1 Eurocigua II

The project Eurocigua II “An integrated approach to assess the human health risks of ciguatoxins in Europe”, started in August 2022 and will conclude by May 2026. Eurocigua II comprises 11 international organisations, five Member States, EFSA, the European Centre for Disease Prevention and Control (ECDC), EEA, the European Commission, FAO and the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific and Cultural Organization (UNESCO). The objectives of this projects are: (i) environmental data collection; (ii) modelling, predicting and mapping the emergence of ciguatoxins in fish in Canary Islands hotspots under climate change; (iii) production of reference material for chemical analysis, development of analytical methods, harmonisation and capacity building; (iv) collection of case/outbreak data; (v) strengthening the reporting and notification of ciguatera outbreaks; and (vi) investigating the contribution of imported fish to ciguatera fish poisoning outbreaks/cases. In 2025, the final meeting was held in Barcelona (25–26 November), attended by a total of 56 participants, including the coordinators of the four specific agreements, partners and collaborators of the project and most of the Advisory Board. The major achievements, uncertainties and follow-up actions were presented and discussed in relation to the sampling of imported fish, reporting of ciguatera outbreaks, analysis of toxic microalgal communities and toxic fish in the Canary Island and the mediterranean, predictive modelling and the ciguatoxin profile in contaminated fish.

4.2 Food fraud

The FFRAUD-ER project aims to develop a computational model to identify food fraud incidents as potential drivers of emerging food safety risks. Building on the milestones achieved in 2024, including model validation, stakeholder engagement and confirmation of its relevance by the Food Fraud Network, the project was finalised in 2025.

The final results demonstrate that advanced natural language processing and machine-learning approaches can effectively analyse historical food fraud data and support the identification of fraud-related emerging food safety risks. The final report describing the development, validation and application of EFSA's food fraud analysis model has been published on the web⁶ and provides a methodological basis for future use in emerging risk analysis and environmental scanning activities.

Looking ahead, EFSA will continue applying the model to food fraud information from the JRC Food Fraud Monthly Reports⁷ and EU agri-food fraud suspicion reports⁸, leveraging advanced methods such as weighting, generative AI, and logistic regression to identify and prioritise food safety risks and to support horizon scanning activities.

4.3 Emerging risks related to food supplements other than vitamins and minerals Food Supplements

The safety of botanical food supplements has long been recognised by EFSA as an area of concern, with emerging issues regularly discussed within EREN. A project endorsed by the Advisory Forum was launched and implemented in 2024 through a Focal Point tailor-made activity coordinated by Agence nationale de sécurité sanitaire de l'alimentation, de l'environnement et du travail (ANSES), France.

The project initially involved seven Member State participants and two observers and has since expanded into a Community of Knowledge, comprising 20 Member States, one European Economic Area country, and two Instrument for Pre-accession Assistance (IPA) countries. The project focussed on the identification and prioritisation of plant-based ingredients in food supplements of concern for human health either because reported in nutriviigilance systems/poison centres, or because made of plants containing naturally occurring substances predicted to be carcinogenic, mutagenic or reprotoxic . Further work aim at identifying whether food supplements containing these substances are marketed in the EU.

The project is expected to conclude in May 2026 and will inform subsequent activities, including composition analysis of food supplements marketed in the EU for possible presence of substances of concern.

5 EFSA Horizon Scanning projects

5.1 Interagency participatory horizon scanning integrating one-health

EFSA, in collaboration with the European Union Drugs Agency (EUDA), ran the project "Multi-agency horizon scanning for future-proof strategy development" bringing together several agencies of the EU-ANSA Futures Cluster and the relevant Commission services to run a participatory ad-hoc horizon scanning process in a one-health approach⁹. The ultimate goal was to inform the possible update of current work programmes and the definition of robust strategies

⁶ FFRAUD-ER: Development of a computational model for identifying Food Fraud incidents as drivers for Food Safety Emerging Risks <https://doi.org/10.2903/sp.efsa.2025.EN-9301>

⁷ https://knowledge4policy.ec.europa.eu/food-fraud-quality/jrc-food-fraud-monthly-report_en

⁸ https://food.ec.europa.eu/food-safety/acn/ffn-monthly_en

⁹ Multi-Agency Foresight with One Health Approach: <https://efsa.onlinelibrary.wiley.com/doi/10.2903/sp.efsa.2026.EN-10045>

to stay relevant in a fast-changing future world. The project was centered upon the identification of early signs, key trends and drivers and the development of future scenarios, on the basis of EU strategic priorities, existing horizon scanning and foresight reports from EU agencies, participatory engagement complemented by AI-based scenarios development. On 12-13 November the final Workshop of the project was held in Lisbon to validate the scenarios for 2035 elaborated in the project, harmonize foresight methodologies, identify and discuss implications, challenges, opportunities, trade-offs and synergies across the different sectors, and foster inter-agency collaboration.

5.2 EFSA horizon scanning for plant health

EFSA PLANTS Unit conducts horizon scanning activity since 2016, thanks to a long-term mandate by DG SANTE. Since the beginning, this is done with the technical support by JRC and the collaboration of ANSES. The core of the activity consists in the selecting and compiling in monthly newsletters the most relevant signals retrieved by the web scraping tool EIOS (Epidemic Intelligence from Open Sources Initiative). On EIOS, EFSA monitors in continuous manner over 3,500 pest species from 32,000 sources in 79 languages. This activity generates monthly newsletters¹⁰ and updates of the interactive dashboard¹¹ freely accessible from EFSA website.

EIOS is a global platform that favours collaboration among users and the adoption of a One Health approach. Notably, this has led to the coordination by EFSA PLANTS of the first plant health community within EIOS, officially launched at the beginning of 2025. The community counts currently more than 50 members among EU and non-EU national authorities and international organisations (including IPPC and CABI).

During 2025, EFSA, ANSES and JRC co-organised two workshops with proceedings available on the Zenodo Archive

- February 2025: targeted at risk managers, this event¹² was dedicated to the identification of needs and priorities of end users in shaping horizon scanning projects.
- December 2025: focused on foresight approaches in the field of plant health, this event¹³ aimed at examining key drivers of new risks to crops and the environment, and to map existing tools and experiences for identifying and clustering information from the web.

Given the fast evolution and increasing complexity of this activity, the integration of further tools and tasks is planned for the coming years.

6 EFSA contribution to Organisational/ Institutional Stakeholders' Emerging Risks and Horizon Scanning activities and associated capacity building

¹⁰ Plant Health Newsletter on HORIZON SCANNING January 2026:

<https://www.efsa.europa.eu/en/supporting/pub/en-9955>

¹¹ Plant Health: Horizon Scanning Dashboard:

<https://www.efsa.europa.eu/en/powerbi/plant-health-horizon-scanning-dashboard>

¹² Report of the Second International Workshop on Horizon Scanning for Plant Health

<https://zenodo.org/records/15696756>

¹³ Report of the Third International Workshop on Horizon Scanning for Plant Health

<https://zenodo.org/records/20425717>

6.1 European Strategy and Policy Analysis System (ESPAS)

In 2025 EFSA participated to the European Strategy and Policy Analysis System (ESPAS) 'sense-making workshops' which objective is to analyse collected 'signals of change' or 'signs of new' trends to identify interconnections across different policies and sectors. The ESPAS is an inter-institutional EU process promoting foresight and anticipatory governance and brings together EU institutions and bodies that are committed to thinking longer term about the challenges and opportunities facing Europe and, through foresight, to support policy-makers to make the right policy choices. EFSA contributes to this process by evaluating the signals and signs mentioned above, while also seeking to identify potential areas not covered by EFSA's strategy.

6.2 Early warning and action system for emerging chemical risks (Regulation (EU) 2025/2455)

The 'One Substance, One Assessment' (OSOA) legislative package entered into force on 1 January 2026. It prescribes the establishment of an EU early warning system (EWS) for emerging chemical risks, which will involve coordination and data sharing between EU agencies as well as input from national early warning systems and research. A key activity in the EWS is the preparation of an annual report containing early warning signals compiled by the EEA from a number of sources (including the EFSA, ECHA, EU-OSHA and EMA).

On 2 October 2025, the first EU EWS inter-institutional meeting was held at the EEA premises and online. The aim was to initiate future cooperation and coordination in the establishment of this early warning system and, in particular, to discuss and agree on:

- Definitions for key terms and common understanding of the concepts they cover
- Next steps in the development of a methodology and workflows
- Requirements and formats for signals to be submitted to the EEA (Data, meta-data and template)
- Involvement and coordination between EU agencies and establishment of ad-hoc working groups

6.3 EC Strategic foresight report

EFSA contributed to the preparation of the European Commission Strategic Foresight Report 2026 responding to the Commission's call for evidence. The ambition of the report is to offer fresh, robust, and forward-looking areas of action to inform strategic thinking and present-day decision-making. The EFSA's contribution was focused on anticipatory governance, multi-institutional foresight, prevention, and the EU's capacity to govern systemic interdependencies, complexity and uncertainty. It was grounded in the outcome of the EFSA's project on "Multi-agency horizon scanning for preparedness and future-proof strategy development in a one-health approach".

6.4 Info-sessions and Collaboration

EFSA Emerging Risk Identification and Horizon Scanning System is based on a collaborative network with member states, stakeholders, third countries and international organisations. In 2025, EFSA has been invited to contribute to the following partners' activities:

- ANSES (France) online workshop on emerging risks in food risk assessment (18-21 November),
- info session to FAVV/AFSCA/FASFC (Belgium) at a topic seminar on Societal changes: What are the challenges for food safety? (5 December),
- collaboration with BFR (Germany) at the Simulation exercise on food-borne outbreaks in Moldova (4 December).

In addition, EFSA met with stakeholders including Eurocommerce (18 February 2025) Fediol, (23 September), Swiss Food Inspectors (9 September), UNESDA (4 December) to present EFSA activities and exchange views on horizon scanning, foresight and emerging risk identification

EFSA experts also presented on AI in food safety at the FAO Science & Innovation Forum (15 October), and on emerging risks at the International Food Fraud Congress (6 November).

7 Conclusions

EFSA has further consolidated in 2025 its capacity to anticipate and address emerging food safety challenges through a structured, network-driven and forward-looking approach. The systematic analysis of emerging issues and horizon scanning signals enabled the identification, prioritisation and characterisation of a wide range of topics, ensuring that both short-term risks and longer-term drivers are captured and integrated into EFSA's strategic processes.

The emerging risk identification activities confirm the continued relevance of contaminants and biological hazards as dominant areas of concern, reflecting both evolving exposure patterns and increasing system complexity across the food chain. At the same time, the significant number of issues requiring further information highlights the intrinsic uncertainty associated with early signal detection and the importance of sustained data collection, targeted research and adaptive monitoring frameworks.

EFSA's horizon scanning activities complement this work by systematically analysing broader drivers, trends and weak signals—ranging from technological innovation (e.g. AI-designed proteins) to environmental and geopolitical factors. These activities have reinforced the importance of integrating foresight into risk analysis, allowing EFSA to move beyond reactive assessments and support proactive preparedness for future challenges.

A key strength highlighted throughout the report is the central role of collaboration. The continuous engagement with knowledge networks such as EREN and StaDG-ER, together with partnerships with EU agencies, international organisations and Member States, has enabled efficient information exchange, early signal validation and coordinated responses. The expansion of multi-agency initiatives, including participatory horizon scanning exercises and One Health collaborations, further strengthens the EU's collective capacity to anticipate and manage complex risks.

Institutional developments in 2025 mark an important step forward in embedding anticipatory governance within the EU risk analysis landscape. In particular, the establishment of the EU Early Warning System for emerging chemical risks provides a structured framework for inter-agency coordination, harmonised methodologies and systematic signal sharing across European institutions. Combined with EFSA's contribution to the European Commission Strategic Foresight

Report 2026, these developments underline the increasing importance of integrating foresight, risk assessment and policy support functions.

The report also demonstrates the growing relevance of cross-cutting challenges—such as climate change, environmental degradation, technological disruption and global interconnectedness—which blur traditional sectoral boundaries and require a holistic One Health perspective. Addressing these challenges will necessitate continued methodological innovation, enhanced data integration and closer collaboration across disciplines and institutions.

Looking ahead, EFSA is well positioned to further strengthen its preparedness by:

- continuing to refine methodologies for the identification and prioritisation of emerging risks;
- enhancing integration between emerging risk identification and horizon scanning workflows;
- expanding the use of advanced analytical tools, including AI and data-driven approaches;
- and reinforcing partnerships at EU and global level to ensure comprehensive coverage of emerging threats.

In conclusion, the 2025 activities confirm that EFSA has established a robust and adaptive system for emerging risk identification and horizon scanning. By combining scientific analysis, collaborative networks and anticipatory governance, EFSA contributes to a more resilient and forward-looking EU food safety system, capable of responding effectively to uncertainty, complexity and future challenges.

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Glossary

Emerging Risk	An 'emerging risk' to human, animal and/or plant health and the environment is understood as a risk resulting from a newly identified hazard to which a significant exposure may occur or from an unexpected new or increased significant exposure and/or susceptibility to a known hazard.
Emerging Issues	Issues recently identified that merit further investigation to determine whether they meet the requirements of an emerging risk. Thus, emerging issues are identified at the beginning of the emerging risk identification process as subjects that merit further investigation and additional data collection.
Weak Signal	Unclear observable trends or patterns that warn about the possibility of future events and illustrate potential future developments (i.e. emerging issues) for which limited and scattered evidence is currently available in the food/feed landscape.
Drivers/Trends	Drivers are internal/external factors influencing developments, decisions, policies, etc., helping to define future scenarios. A driver can have a direct or indirect impact on a system, while a trend reflects a change within the system. Hence, a driver is more specifically used to describe the phenomena underlying trends and other developments that eventually lead to the emergence of risks.
Environmental Scanning	Environmental scanning focuses mainly on current developments in STEEPLE (social, technological, economic, environmental, political, legal and ethical) factors and in our immediate environment that are outside our control but with which we live now.
Horizon Scanning	Horizon scanning tries to identify the early weak signals that may evolve into emerging issues in the future but are not yet to be found in current-day research or the media. Those emerging issues can then become trends over time, possibly with transformative consequences, or disappear without further notice.
Foresight	Foresight understands the future as an emerging entity that is only partially visible in the present, not a predetermined destiny that can be fully known in advance (predicted). The objective is not to 'get the future right', but to expand and reframe the range of plausible developments that need to be taken into consideration to prepare for future challenges, build resilience and take action now to proactively shape the future.

Abbreviations

AI	artificial intelligence
ANSA	Agencies Network on Scientific Advice
ANSES	Agence Nationale de Sécurité Sanitaire de l'Alimentation, de l'Environnement et du Travail – the French Agency for Food, Environmental and Occupational Health and Safety
APMV 1	Avian paramyxoviruses type 1
BN	Briefing Note
BVL	Bundesamt für Verbraucherschutz und Lebensmittelsicherheit – the German Federal Office of Consumer Protection and Food Safety
CDR	carbon dioxide removal
DDFS	Department of Digital Food Science, University of Veterinary Sciences Budapest, Hungary
DG AGRI	Directorate-General for Agriculture and Rural Development
EC	European Commission
EEA	European Environment Agency
EFSA	European Food Safety Authority
EFSCM	European Food Security Crisis preparedness and response Mechanism
ERAP	Emerging Risk Analysis Platform
EREN	Emerging Risks Exchange Network
ESPAS	European Strategy and Policy Analysis System
EU	European Union
FAO	Food Agriculture Organization
FAVV/AFSCA/FASFC	Federal Agency for the Safety of the Food Chain, Belgium
FCM	food contact material
FEDIOL	the EU vegetable oil and protein meal industry association
FPM	food packaging material
FSA	Food Standards Agency of the United Kingdom
FSAI	Food Safety Authority of Ireland
GMO	genetically modified organism
HPAI	Highly Pathogenic Avian Influenza
IFPRI	International Food Policy Research Institute
JRC	Joint Research Centre
KNOW	Knowledge Innovation and Partnership [EFSA Unit]
MOAH	mineral oil aromatic hydrocarbons
MOSH	mineral oil saturated hydrocarbon
OROV	Oropouche virus
OECD	Organisation for Economic Co-operation and Development
PARC	Partnership for the Assessment of Risks from Chemicals
PFAS	Per- and polyfluoroalkyl substances
REACH	registration, evaluation, authorisation and restriction of Chemicals
Ruokavirasto	Finnish Food Authority
SAM	Scientific Advice Mechanism to the European Commission
SAPEA	Science for Policy by European Academies, which is part of the Scientific Advice Mechanism to the European Commission (SAM)
STHs	Soil-transmitted helminths
StaDG-ER	Stakeholder Discussion Group on Emerging Risk
SSB	Sugar and sugar-sweetened beverages



TBE	tick-borne encephalitis
TDI	Tolerable daily intake
TFA	Trifluoroacetic acid
UK DEFRA	UK Department for Environment, Food & Rural Affairs
UNEP	United Nations Environment Programme
WEF	World Economic Forum
WHO	World Health Organization
WOAH	World Organisation for Animal Health