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EFSA's activities on Emerging Risks in 2023

European Food Safety Authority (EFSA)

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Abstract

The main objectives of EFSA's activities on environmental scanning encompass: (i) the identification and analysis of emerging risks as well as more forward-looking signals, drivers and trends that could affect EFSA's work programme; (ii) developing and improving emerging risk identification methodologies and approaches; and (iii) communicating issues and risks that have been identified. The outcome of these activities equips EFSA to anticipate forthcoming challenges in the continuously evolving landscape of risk assessment. EFSA networks of knowledge that contribute to the emerging risks identification activity include the Emerging Risks Exchange Network (EREN), the Stakeholder Discussion Group on Emerging Risks (StaDG-ER), EFSA's scientific units, the Scientific Panels, the Scientific Committee and their working groups. The current technical report summarises the activities of all groups involved in the environmental scanning process, the issues identified in the course of 2023, and the collaborative activities. In total, 32 potential emerging issues were discussed in 2023 and five were concluded to be emerging risks. The potential issues were classified according to the hazard.

In 2023, EFSA has further implemented its environmental scanning and strategic options definition process with the development of the Emerging Risks Exchange Platform (ERAP), which is intended to centralise all emerging risks analysis activities. Acknowledging the breadth and variety of the scientific areas to be covered, EFSA has also put in place a collaborative network for preparedness that goes beyond just the European Union. Finally, special attention has been given to increasing the visibility of EFSA's environmental scanning work, making use of FoodSafeR's digital hub to disseminate EFSA's activities to a worldwide community of professionals dealing with preparedness, and with the creation of the biannual EFSA newsletter "*Emerging Risks Update*," which provides valuable insights into EREN's and StaDG-ER's meetings and discussions, recent news and publications, upcoming events and activities related to environmental scanning.

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1 Introduction

1.1 Background

The European Food Safety Authority (EFSA) is committed to fulfilling its regulatory obligations, as outlined in Articles 23 and Article 34 of Regulation (EC) No. 178/2002/EC¹, by proactively identifying and characterising emerging risks in the fields within its mission. This involves establishing monitoring to systematically search for, collect, collate and analyse information and data. EFSA has developed a working definition for emerging risks² (EFSA, 2020) and consulted with experts to create a practicable approach to their identification and characterisation. To facilitate the identification of emerging risks, EFSA has established the Emerging Risk Exchange Network (EREN³) and the Stakeholder Discussion Group on Emerging Risks (StaDG-ER). These participatory platforms enable Member States and other stakeholders to contribute to the process and share information. The system in place is designed to ensure that EFSA remains vigilant and responsive to emerging risks, thereby safeguarding the health and well-being of European citizens.

EFSA's activity report on emerging risks can be considered as a tool for proactive identification of weak signals, trends and potential emerging issues and risks in the landscape of EFSA's remit. In this way it can serve as a source of information and data on unforeseen risks, the result of a collaborative effort among EFSA's institutional and external stakeholders.

The emerging risk identification process is part of EFSA's environmental scanning procedures, which are integral to the Agency's strategic foresight initiatives. By closely monitoring progress in science, shifts in market dynamics, international trade flows and environmental changes, EFSA is able to anticipate and appraise potential emerging issues and risks before they escalate into prevalent concerns.

1.2 Purpose and scope

EFSA's activities on emerging risks have three main objectives: (i) to conduct activities that enable the identification of emerging risks; (ii) to develop and refine emerging risk identification (ERI) methodologies and approaches; and (iii) to effectively communicate the issues and risks that have been identified. By pursuing these objectives, EFSA is better equipped to anticipate and address future risk assessment challenges.

This technical report provides a comprehensive summary of the activities of all the groups involved in the ERI procedure, including the identification of issues that arose in 2023, as well as a detailed description of the methodologies being developed and collaboration activities being undertaken.

¹ Regulation (EC) No 178/2002 of the European Parliament and of the Council of 28 January 2002 laying down the general principles and requirements of food law, establishing the European Food Safety Authority and laying down procedures in matters of food safety. OJ L 31, 01/02/2002, p. 1–24.

² '[A]n 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 significant exposure may occur or from an unexpected new or increased significant exposure and/or susceptibility to a known hazard' (EFSA, 2019).

³ <https://www.efsa.europa.eu/en/science/scientific-committee-and-panels/scientific-committee>

2 Knowledge networks

2.1 Emerging Risks Exchange Network

The Emerging Risks Exchange Network (EREN) was established in 2010 to exchange information with Member States on possible emerging risks for food and feed safety. The network provides a platform for scientific cooperation and collaboration between risk assessors of the EU Member States, EFSA, the European Commission and other interested parties to assess newly identified emerging issues/risks and enhance ERI methodologies. The network consists of national experts on ERI and observers from international organisations and other institutional stakeholders and is fully integrated into EFSA's ERI procedure. More information on the network and its activities can be found on EFSA's website⁴.

2.1.1 Emerging Risks Exchange Network meetings

According to the planned schedule, EREN met twice in 2023, arranging hybrid sessions (simultaneous in-person and web attendance) on both occasions: on 3–4 May 2023 (29th meeting) and 21–22 November 2023 (30th meeting). The agenda of the two meetings is summarised in Table 1. A short description of the issues discussed, conclusions and recommendations is given in Tables 4, 5 and 6. Other signals identified by different EREN members as part of their own horizon-scanning activities are listed in Table 7.

Table 1: Summary of Emerging Risks Exchange Network (EREN) discussions in 2023

Discussion area	Items	Meetings in 2023
Presentation and discussion of Emerging Issues	<p><u>Emerging risks:</u> ID 0467: Z15 nanomaterial used in wastewater treatment plants in Ireland and the EU</p> <p><u>Further information needed:</u> ID 0463 (previous issue M0195): Oder River fish dieoff – salt discharges caused mass proliferation of toxic alga</p> <p>ID 0464 (previous issue M0198): Tara flour as a potential cause of illness</p> <p>ID 0465 (previous issue M0199): Spread of <i>Burkholderia pseudomallei</i></p> <p>ID 0466 (previous issue M0200): Analysis of samples of explosives excavated from the Baltic Sea floor</p> <p>ID 0468: Insights into the relevance of <i>Bacillus cytotoxicus</i> as a food-borne pathogen</p> <p>ID 0471: Report of <i>Atherigona orientalis</i> (Diptera: Muscidae) in mainland France: a very polyphagous and unregulated pest fly</p> <p><u>No emerging risk:</u> M0194: Influence of legacy mercury on antibiotic resistomes</p>	29th (3–4 May)

⁴ <https://www.efsa.europa.eu/en/topics/topic/emerging-risks>



	<p>M0196: Pretreating soil with ethanol protects plants from drought</p> <p>M0197: Salicylaldehyde for fungal and pre- and post-emergent weed control</p> <p>ID 0469: Microbiological risk of plant-based products alternatives to animal products</p> <p>ID 0470: Per- and polyfluoroalkyl substances found in organic eggs in Denmark</p>	
	<p><u>Emerging risks:</u> ID 0479: Rare earth elements</p> <p>ID 0480: Alcohol replacement drinks</p> <p>ID 0477: Pathogen spillover of Henipavirions driven by environmental changes</p> <p>ID 0481: Epizootic haemorrhagic disease – an emerging risk in Europe</p> <p><u>Further information needed:</u> ID 0475: Perinatal exposure to food-borne inorganic nanoparticles</p> <p>ID 0478: <i>Providencia</i> spp. in food</p> <p>ID 0486: Blue algae proliferation</p> <p>ID 0485: Plasticosis in birds</p> <p><u>No emerging risk:</u> ID 0476: Enhancing bread quality and shelf life via glucose oxidase immobilised on zinc oxide nanoparticles</p>	30th (21–22 November)
Information /situational update	<p><u>Topics updated:</u> Update on ID 0453: Sesame seeds</p>	29th (3–4 May)
	<p><u>Topics updated:</u> Update on ID 0464: Tara flour</p> <p>Update on ID 0291: Usutu viruses</p> <p><u>Topics shared by Subject Matter Units:</u> Update on <i>Fusarium</i> mycotoxins</p> <p>Re-evaluation of erythritol as a food additive Horizon scanning activities in the area of plant health</p>	30th (21–22 November)
Feedback on EREN/EFSA activities	<p><u>Methodologies:</u> Updates on emerging risks in VIBE (Food Standards Australia New Zealand)</p> <p>Recent developments in European Environment Agency–EFSA collaboration on One Health and possible implications for the EREN</p> <p>Trends and early signals in the food chain identified with data analytical methods (Hungary)</p>	29th (3–4 May)



	<p>Open a new window in enhanced veterinary clinical decision-making (Belgium)</p> <p>Expert knowledge elicitation tick-borne encephalitis human cases update (Belgium)</p> <p>Emerging risk identification workflow and Emerging Risks Exchange Platform (EFSA)</p> <p>Emerging Risk Reporting – newsletter options (EFSA/EREN)</p> <p><u>Projects:</u> FoodSafeR – update (Food Safety Authority of Ireland (FSAI), Ireland)</p> <p>HOLiFOOD project – update (Hungary)</p> <p>First survey on agreement with existing definitions of livestock biosecurity (Belgium)</p> <p>Food safety threats associated with conflict (FSAI, Ireland)</p> <p>World Health Organization (WHO) update (WHO)</p> <p>Water scarcity (Food and Agriculture Organisation - FAO)</p> <p>Emerging chemical risk identification: the SCREENER project (EFSA)</p> <p>EuroCigua II Project update (EFSA)</p> <p>Food Fraud project – update (EFSA)</p> <p>Emerging risk identification in food supplements – update (EFSA)</p> <p>Future food and feed lab workshop (EFSA)</p> <p>EFSA colloquium on cell culture-derived foods and food ingredients (EFSA)</p>	
	<p><u>Projects:</u> Influenza D viruses project (Belgium)</p> <p>Potential risks related to functional food and nutraceuticals (Portugal)</p> <p>FoodSafeR – update (Ireland)</p> <p>Emerging Risks Exchange Platform – update (EFSA)</p> <p>HOLiFOOD – update (Hungary)</p> <p>Food Fraud – update (EFSA)</p> <p>Oceans – update (EFSA)</p> <p>Food supplements project – update (EFSA)</p>	<p>30th (21–22 November)</p>

2.2 Stakeholder Discussion Group on Emerging Risk

EFSA is committed to increasing public and stakeholder involvement in the process of risk assessment. The reviewed approach to stakeholder engagement (EFSA, 2019)⁵ enables EFSA to interact with a larger range of stakeholders through permanent and targeted platforms. Targeted platforms are established by a set of interests and the specific knowledge that stakeholder communities bring to the various phases of EFSA's work. Discussion groups are 'learning systems' that allow EFSA to capitalise on stakeholders' specialist knowledge in specific areas, such as developing efficient and harmonised data collection systems, methodological approaches and identification of new or emerging issues.

The role of stakeholders is essential to increase EFSA's capacity to anticipate emerging scientific or societal issues. The Stakeholder Discussion Group on Emerging Risk (StaDG-ER) has, since 2011, been an efficient tool to engage with EFSA-registered stakeholder organisations. The composition of the group (Table 2) was reviewed in 2023. As a result, the Stakeholder Group is now bigger, with 26 members, compared with 19 previously. All the EFSA stakeholder categories are represented in the new composition apart from academia. At its first meeting, EFSA introduced EFSA's ERI system and what is expected from members to make it meaningful and productive. From the analysis of previous mandates, the most common topics brought to the group for discussion related to potential risks associated with difficulties implementing legislation that is already in place (e.g. the increased risks to food safety due to packaging bans) as well as topics dealing with consumer trends (e.g. cannabidiol and cannabidiol-containing products, or health concerns over flowers in food and feed).

Following the adoption of a new policy to ensure a more representative distribution of all stakeholder categories, the composition of the StaDG-ER was renewed in 2023. The stakeholder categories according to EFSA's policy⁶ are consumer organisations, business and the food industry, environmental/health non-governmental organisations (NGOs) and/or advocacy groups, farmers and primary producers, distributors and HORECA, practitioners and academia.

Table 2: Member organizations of the Stakeholder Discussion Group on Emerging Risks

SEA Registered Stakeholder category	Organisation
Associations of Practitioners	Association of Veterinary Consultant (AVC)
	European Food Information Council (EUFIC)
Business and food industry	FoodDrinkEurope
	The Primary Food Processors of the EU
	Union of European Beverages Associations (UNESDA)
	Association of the European Self-Care Industry (AESGP)
	COCERAL AISBL
	European Biostimulants Industry Council (EBIC)

⁵ Stakeholder Engagement Approach Interim evaluation report Pilot phase June 2016 – November 2017, mb180321i5, <https://www.efsa.europa.eu/sites/default/files/event/mb180321/mb180321-i5.pdf>

⁶ Decision of the management board of the European Food Safety Authority on the criteria to register stakeholders and the mechanisms to engage with stakeholders: <https://www.efsa.europa.eu/sites/default/files/Document18992.pdf>

	European Chemical Industry Council (CEFIC)
	European Compound Feed Manufacturers' Federation (FEFAC)
	European Dairy Association (EDA)
	European Livestock and Meat Trades Union (UECBV)
	Food Supplements Europe
	International Biocontrol Manufacturers Association (IBMA)
	International Platform of Insects for Food and Feed (IPIFF)
	Liaison Centre for the Meat Processing Industry in the European Union (CLITRAVI)
Consumer associations	Safe Food Advocacy Europe (SAFE)
Distributors and HORECA	Euro Commerce
	Food Service Europe
	Serving Europe
Farmers and primary producers	Copa and Cogeca
	European Federation for Animal Health and Sanitary Security (FESASS)
NGOs and advocacy groups	Association of Natural Medicine in Europe (ANME)
	Federation of Veterinarians of Europe (FVE)
	PETA Science Consortium International e.V.

2.2.1 Stakeholder Discussion Group on Emerging Risks meetings

The group met online twice in 2023 on 7 and 8 June (29th meeting) and on 8 and 9 November (30th meeting). The agendas of the two meetings are summarised in Table 3. Short descriptions of the issues discussed, along with the conclusions and recommendations, are presented in Tables 4 and 5.

Table 3: Summary of the discussions of the Stakeholder Discussion Group on Emerging Risks in 2023

Discussion area	Items	Meetings in 2023
Presentation and discussion of Emerging Issues	<p>Further information needed: ID 0474: Potential occurrence of primary sensitisation allergies in insect products and consumer information</p> <p>ID 0473: Concerns on the risk of food contamination by bisphenol A through its release from micro- and nano-plastics in soils and irrigation water</p> <p>Allergens in alternative food packaging, trending foods and alternative proteins</p> <p>No emerging risk: ID 0472: Cadmium in flaxseed products</p>	29th (7–8 June)



	<p><u>Further information needed:</u> ID 0481: Epizootic haemorrhagic disease (EHD) – an emerging risk in Europe</p> <p>ID 0482: Global spread of rat lungworm (<i>Angiostrongylus cantonensis</i>)</p> <p>ID 0483: Impact of the effect of climate change on food security and trade patterns for grains/oilseeds/pulses as a driver of quality and safety issues</p> <p>ID 0484: Aichivirus (AiV) as a potential cause of gastroenteritis outbreaks</p> <p>Risk associated with the increase in consumption of <i>Amanita muscaria</i></p>	<p>30th (8–9 November)</p>
<p>Information/situational update</p>	<p>Recent findings on microplastics in aquaculture fish</p> <p>Comparative toxicity of conventional versus compostable plastic consumer products</p> <p>Monitoring trade patterns of different potential fomites and carriers of African Swine Fever virus (ASF-virus)</p> <p>Impact of low temperature on African swine fever virus transmission through contaminated environments</p> <p><u>Follow-up on the emerging issue</u> ID0420: Public health risk associated with raw meat-based diets (RMBD) for cats and dogs</p> <p>TIC Council – Summary of emerging risk triggers identified by SGS DIGICOMPLY</p>	<p>30th (8–9 November)</p>
<p>Feedback on the Stakeholder Discussion Group on Emerging Risks /EFSA activities</p>	<p>Future Food/Feed Lab (EFSA)</p> <p>Emerging chemical risk identification: the SCRENER project – update (EFSA)</p> <p>Emerging risk identification in food supplements – update (EFSA)</p> <p>Update on FFRAUD-ER project: Development of a computational model for identifying food fraud incidents as drivers of food safety emerging risks (EFSA)</p>	<p>29th (7–8 June)</p>



	<p>European Food Security Crisis Preparedness and Response Mechanism (EFSCM): Mapping the Risks and vulnerabilities in the EU food supply chain (Federation of Veterinarians of Europe, FVE)</p> <p>Update on 'Integration of New Approach Methodologies (NAMs) in food safety risk assessment' position paper (FoodDrinkEurope, FDE)</p>	
	<p>Update on the environmental scanning process and the Emerging Risks Exchange Platform tool (EFSA)</p> <p>Update on FFRAUD-ER project: Development of a computational model for identifying food fraud incidents as drivers of food safety emerging risks (EFSA)</p> <p>Anticipation of food safety and fraud issues: Import Screening for the Anticipation of Food Risks (ISAR) – monitoring food prices and commodity flows (Bavarian Health and Food Safety Authority)</p> <p>Food fraud – proof of concept Innovation zone (EFSA)</p> <p>Update on EFSA's project: Future challenges for the safety of food and feed from the oceans: A foresight study (EFSA)</p> <p>Preview of the topics on the agenda of the Emerging Risks Exchange Network meeting (EFSA)</p> <p>Update on emerging risks identification in food supplements (EFSA)</p> <p>Update on EFSA's Screening for emerging chemical risks in the food chain (SCREENER) project (EFSA)</p> <p>Newsletter on emerging risk activities (EFSA)</p>	<p>30th (8–9 November)</p>



3 Identification of emerging issues, trends and drivers

3.1 Potential emerging issues evaluated

Member States participated in the identification, characterisation and analysis of signals. EFSA was alerted to 52 possible issues and, after pre-assessment, 29 were qualified as relevant and followed up with EREN and StaDG-ER to final assessment and classification whether they constitute emerging risks. Three more signals were raised in proximity to the network meetings and elaborated during the group discussions. The signals were assessed against a set of predefined criteria: (i) new hazard; (ii) new or increased exposure; (iii) new susceptible group; and (iv) new driver. The criteria are based on the EFSA definition of emerging risk and emerging issues. Information on emerging risks is collected and updated in Briefing Notes and metadata attributed to their classification and the area of relevance according to EFSA scope and remit. The conclusions and recommendations reflect the views of EREN and/or StaDG-ER as indicated. They do not represent EFSA's view and position but reflect the discussions in the networks.

In total, 32 potential emerging issues, were discussed in 2023. Each issue was presented in the form of a standard Briefing Note or a presentation. When information was available, the issues were classified according to the hazard or driver identified [Hazard identified: Biological (9), Chemical (17), Biological and Chemical (2), Other (2), Driver identified: New process or technology (2).

Five issues were considered to be emerging risks (summarised in Table 4), seven were not considered to be emerging risks (Table 5) and twenty issues were finalised with the view that more information was needed (Table 6).

In addition, 46 items (Table 7) were brought to EFSA's attention as a result of Member States' own horizon-scanning activities. However, after a pre-assessment of the relevance and sufficiency of the information, those were not processed for further assessment.

The discussions at the network meetings encompass a variety of items. In 2023, several topics of emerging risk relevance were discussed by EREN and StaDG-ER, including a total of 86 items covering possible issues within ERI, the assessment surveys, and also relevant projects and wider methodological and thematic activities.



Table 4: Emerging risks (a new hazard, new or increased exposure or a new susceptible group was identified)

(ID 0467) Z15 nanomaterial used in wastewater treatment plants in Ireland and the EU						
<p>Z15, an engineered nanomaterial consisting of Iron Oxide particles coated with folic acid, has been adopted by an Irish water and waste treatment industry in Ireland as the first nanoscale flocculant or precipitant. It is reportedly being used in 5,000 wastewater treatment plants across the EU, and remains in the biosolid fraction, which is recycled onto agricultural land. This raises concerns about its potential to enter the food chain. In Ireland, biosolids are commonly reused on agricultural lands as soil conditioners and fertilisers, with approximately 98% of the biosolids produced being reused. It is important to note that the high surface-to-volume ratio of nanomaterials can increase the likelihood of interactions with bodily components if absorbed, while their ability to cross cell barriers and resist biodegradation can increase their potential toxicity.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/increased exposure ^(c)	New/susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN FSAI/Ireland	New process or technology	Y	Y	Y	Y	Further information on the life cycle of this product, its stability and exposure levels should be collected.
(ID 0479) Rare earth elements						
<p>Rare earth elements are commonly found in electronic devices, which have seen a significant increase in usage in recent years. In 2020, there were 4.7 million tonnes of electronic waste in the EU, with only 46.2% being recycled. The presence of these substances in feed and food may pose a risk to consumers, but there are currently insufficient data on their occurrence and toxicity. Children may be the most vulnerable population, although adverse effects in adults cannot be ruled out. Furthermore, there are limited data on the effects of rare earth elements on animals and the environment. While studies have not yet identified safety concerns related to their presence in food, the possibility of hazards cannot be ignored, and exposure to the environment is likely.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/increased exposure ^(c)	New/susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN DTU/Denmark	Chemical hazard	Y	NC	Y	NC	A better understanding of the sources, environmental behaviour, ecotoxicology and human toxicology is needed. Other countries in Europe are invited to share any relevant information that could help to



						characterise the risk or exposure to these rare earth element substances.
<p>(ID 0480) Alcohol replacement drinks</p> <p>Alcohol replacement drinks are made with food-grade herbs that contain molecules that work on the GABA system, which produces a state of relaxation and sociality. By targeting the GABA system, the drink avoids targeting the other neurotransmitter systems that alcohol affects, which can lead to problems when larger doses are consumed. The use of these herbs is believed to minimise the risk of dependence, as they are not known to activate the dopamine system, which is a key driver of alcohol dependence and craving. The substance used in this beverage is a synthetic molecule that targets subtypes of the GABA system to mimic the effects of alcohol in a more specific way. The goal is to license the product as an ingredient that can be used extensively as an alternative to alcohol by any drinks company in the world. The molecule is designed to offer the pleasure of alcohol with less harm and far fewer calories.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/increase d exposure ^(c)	New/susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN Digital Food Institute (DFI)/Hungary	Chemical hazard	NC	Y	Y	Y	According to the 'Guidance on Novel Food application process' provided by EFSA in 2016 and revised in 2021, 'taking into account the source of the novel food, qualitative and quantitative data on inherent substances of possible concern to human health (e.g. toxic, addictive, psychotropic, allergenic) should be provided'. Such information will help to assess potential risks linked to this new kind of beverage.
<p>(ID 0477) Pathogen spillover of Henipavirions driven by environmental changes</p> <p>The Hendra and Nipah viruses are emerging zoonotic viruses that have high mortality rates in both humans and animals. The Henipaviruses responsible for these diseases are carried by small mammals, such as fruit bats. However, the risk of pathogen spillover to humans is significant and is associated with the loss of bat habitats due to environmental changes driven by climate change. This poses a public health concern, as highlighted by a recent outbreak of Nipah virus in Bangladesh. In this outbreak, eight people died from Nipah virus infection after consuming raw date palm sap, and a total of 11 individuals aged from 15 days to 50 years were infected. Despite communication and community engagement efforts, outbreaks of Nipah virus occur regularly every year during the harvesting season in Bangladesh.</p>						



Author	Classification	New driver ^(c)	New hazard ^(c)	New/increased exposure ^(c)	New/susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN The Federal Office of Consumer Protection and Food Safety (BVL)/Germany	Biological hazard	Y	N	Y	NC	Monitoring the evolution of the situation in endemic areas is needed, particularly if it tends to affect commodities relevant for Europe. Further information from bat samples may allow early detection and follow-up of these viruses genetically in Europe.
<p>(ID 0481) Epizootic haemorrhagic disease – an emerging risk in Europe</p> <p>Epizootic haemorrhagic disease virus (EHDV) belongs to the Orbivirus genus, of which there are currently seven serotypes (EHDV1, 2, 4–8). Like the Bluetongue virus, EHDV is transmitted between ruminant hosts by biting midges of the <i>Culicoides</i> genus. In 2022, cattle infected with EHDV-8 were discovered in Sardinia, Sicily and Andalusia. The first cases in France were reported in 2023, leading to an extensive genome sequencing of deer and cattle. An EFSA supporting publication on epizootic haemorrhagic disease was published, presenting the outcome of a systematic literature review (Avelino De Souza Santos et al., 2023). There is a high risk of the disease spreading (at least in the south of Europe). The influence of temperature on the abundance and survival of the vector population, the movements of live animals from neighbouring countries and the growing populations of indigenous wild mammals are reported to be important drivers.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/increased exposure ^(c)	New/susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN ANSES/France	Biological hazard	Y	NC	Y	NC	Other countries in Europe not affected yet may implement a monitoring system because of the spread pattern.

- (a): Each issue is presented using a standard briefing note template and given a unique identifier number (ID No.).
- (b): Classification by hazard and/or driver: microbiological hazard, chemical hazard, other, illegal activity, new consumer trends, new process or technology.
- (c): Yes (Y), No (N), Not concluded (NC).
- (d): The conclusions and recommendations were produced and adopted by EREN and StaDG-ER as indicated. They may not be considered as EFSA's view and position as regards the issues addressed, subject to the rights of the authors.



Table 5: Not an emerging risk (no new hazards, no new or increased exposure and no new susceptible groups were identified)

(ID 0469) Microbiological risk of plant-based products alternatives to animal products						
<p>The industrial production of plant-based products for vegans and vegetarians has experienced significant growth in Europe in recent years. Five severe cases of listeriosis have been reported to the French health authorities, four of which were in pregnant women who experienced premature deliveries. These cases were infected with the same strain of <i>Listeria</i> and reported symptoms between April and December 2022. Before contracting listeriosis, these individuals had consumed vegetable specialties (cheese alternatives) with almond and walnut milk and cashew nuts, in the weeks leading up to their illness. Spore-forming bacteria and <i>Staphylococcus aureus</i> have previously been detected on plant-based products.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN ANSES/France	Biological hazard	N	Y	Y	Y	Although this issue brings attention as relevant to the trend of possible food substitutes it is not an emerging risk and mostly related to risk management practices which could be mitigated at company level.
(M0194) Influence of legacy mercury on antibiotic resistomes						
<p>An article published in October 2021 demonstrated the effect of legacy mercury on antibiotic resistomes in different cropping systems (Zhao et al., 2021). The author found significantly different antibiotic resistance gene (ARG) profiles between paddy and upland. However, the diversity and abundance of ARGs from soil with chronic mercury contamination was higher for both paddy and upland soil than from soil without mercury contamination. This study demonstrated the underappreciated role of legacy Hg as a potential persistent selecting agent in contributing to the ARG profiles of soil in agroecosystems. The findings may add useful information to tackle the complex challenge of antimicrobial resistance worldwide.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN Digital Food Institute (DFI)/Hungary	Biological and chemical hazard	N	N	NC	N	As it is still hypothetical, there is currently no evidence to suggest that the issue is a potential emerging risk.
(M0196) Pre-treating soil with ethanol protects plants from drought						
<p>The development of technologies to mitigate the damage caused by drought stress is essential for ensuring a sustainable food supply for the increasing global population. Exogenous application of ethanol in soil aiming to enhance drought tolerance in <i>Arabidopsis thaliana</i>, rice and wheat. The phenotyping</p>						



analysis indicated that drought-induced water loss was delayed in the ethanol-treated plants. Furthermore, ethanol treatment induced stomatal closure, resulting in a decreased transpiration rate and increased leaf water content under drought stress conditions. At low concentrations and amounts, ethanol is rapidly metabolised without apparent harm in the soil. However, ethanol released at higher concentrations can pose a risk because it can have an acute effect on a wide range of biota, where it can cause microbial death (ethanol is a disinfectant). An additional risk is the release of carbon dioxide into the atmosphere during ethanol degradation.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN DFI/Hungary	Chemical hazard	Y	NC	NC	N	The risk is still hypothetical.

(M0197) Salicylaldehyde for fungal and pre- and post-emergent weed control

A study was published in 2022 (Kim and Chan, 2022) about the use of salicylaldehyde (SA; 2-hydroxybenzaldehyde) as a sustainable alternative weed control strategy. SA is a natural, redox-active small molecule listed as a food additive generally recognised as safe by EFSA and the United States Food and Drug Administration. Agricultural by-products (tree nutshell particles) were developed as SA delivery vehicles to the soil. In the study, SA prevented the germination of six invasive or native weed seeds, the germination and growth of *Lagurus ovatus* (Bunny Tails Grass). SA also shows an intrinsic antifungal activity that overcomes the tolerance of the stress-signalling mutants of filamentous fungal pathogens to the phenylpyrrole fungicide fludioxonil. It's important to note that SA has not been approved yet in the EU as a fungicide and herbicide. However, its new application may be accompanied by new health and environmental risks.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN DFI/Hungary	Chemical hazard	Y	N	Y	N	There is a lack of knowledge on the effects of residues of SA, and it is important to establish a vigilance system to inform national authorities of any potential use and the associated consequences. At present, there is not sufficient information to determine whether there will be any risks in the future related to SA.

(ID 0476) Enhancing bread quality and shelf life via glucose oxidase immobilised on zinc oxide nanoparticles

A research paper published in 2022 aimed to develop an approach for the enhancement of the quality and longevity of bread, with the immobilisation of an *Aspergillus niger*-purified enzyme on zinc oxide nanoparticles (ZnONPs) and immersion in a buffered solution to create a mixture of Glucose



Oxidase/ZnONPs (Khan et al., 2022). The shelf life of bread so treated was greatly extended, and the microbiological load, including yeast and mould and total bacterial count were much lower than in the control group. The most common enzyme employed in the bread-baking business is glucose oxidase with the aim of extending food products' shelf lives. However, due to its instability, it has limited industrial applications; therefore, going forward, a novel target is to make it stable by immobilisation. According to the article, research demonstrated that enzymes based on nanoparticles had better stability and strength in comparison to their counterparts.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN DFI/Hungary	New process or technology	NC	NC	NC	N	This product will have to be assessed by the European Novel Food Regulation before being put on the market. It should also be noted that there is already an ongoing EFSA project that will assess the possible toxicity of zinc oxide nanoparticles.

(ID 0470) Per- and polyfluoroalkyl substances (PFAS) found in organic eggs in Denmark

PFAS contamination was found in organic eggs in Denmark in autumn 2022 (DTU, 2023). The PFAS levels were significantly higher than PFAS levels in barn eggs and free-range eggs. In eggs, PFAS concentrate in the egg yolk by binding to the cholesterol. It was suspected that the high levels of PFAS were linked to the use of fishmeal as an additional feed for the organic egg-laying hens as a natural source of high-level protein and the essential sulfur-containing amino acid methionine. PFAS is a known contaminant in fish and when fishmeal is added into the feed it can contaminate the food chain and become an additional source of human PFAS exposure. In response to these findings, organic farmers have taken measures to stop using fishmeal as feed for organic egg-laying hens starting from January 2023.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN DTU/Denmark	Chemical hazard	Y	N	Y	N	EFSA commented that the issue was handled by the Directorate-General for Health and Food Safety and that there were ongoing activities in terms of data collection and risk management.

(ID0472) Cadmium in flaxseed products

Flaxseeds (linseeds) have been called a superfood, owing to their nutrition profile (Nowak and Jeziorek, 2023). The global flaxseed market and the demand for flaxseed products intended for human consumption is expected to increase. High concentrations of cadmium (Cd) in some whole and ground flaxseed products have been reported (Consumerlab, 2024). In Brazil, levels up to 0.79 µg Cd/g in commercial flaxseed flour from Brazil have been



<p>reported (Lemes and Tarley, 2021). Studies on the potential for flaxseed produced for human consumption to accumulate Cd have previously been conducted, particularly during the 1990s (Bjelková et al., 2011; Kymäläinen and Sjöberg, 2006). A study from Finland concluded that consumption of linseed with a high Cd concentration could approach health-based limits for people with lower body weight (Kymäläinen and Sjöberg, 2006). Cd is a naturally occurring heavy metal in soils although concentrations can become elevated through agricultural or industrial activities. Several reports describe flaxseed plants as Cd hyperaccumulators, with current interest focusing on using flaxseed plants to bioremediate contaminated soils (Bjelková et al., 2011, Saleem et al., 2020). This issue was raised in New Zealand because parts of New Zealand have elevated Cd soil concentrations due to historic phosphate fertiliser use. In New Zealand, Cd in soil is monitored (NZ Cadmium Management Group, 2019). Linseeds have not yet been the target of a specific assessment for Cd levels. Cd is acutely toxic at high levels of intake and can cause chronic toxicity problems in the kidneys and liver.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
<p>StaDG-ER</p> <p>Institute of Environmental Science and Research (ESR), New Zealand</p> <p>New Zealand Food Safety</p>	<p>Chemical hazard</p>	<p>Y</p>	<p>N</p>	<p>Y</p>	<p>N</p>	<p>StaDG-ER recommendation:</p> <ol style="list-style-type: none"> 1. Need to monitor the level of Cd in protein-rich seeds (e.g. flaxseed and other oilseeds) used in plant-based products and the relevance of considering the origin of the seeds and potential by-products when monitoring. 2. Need for a risk-benefit assessment due to the increased consumption of seeds. 3. The opportunity for initiative Zero Pollution Monitoring Assessment, coordinated by the European Environment Agency, to be followed by risk managers for the aforementioned monitoring. 4. Regulation (EU) 2019/1009⁷ on fertilisers, setting maximum levels for cadmium, may be of use when checking the level of cadmium in seeds.

⁷ Regulation (EU) 2019/1009 of the European Parliament and of the Council of 5 June 2019 laying down rules on the making available on the market of EU fertilising products and amending Regulations (EC) No 1069/2009 and (EC) No 1107/2009 and repealing Regulation (EC) No 2003/2003. OJ L 170, 25.6.2019, p. 1–114.



Table 6: Further information needed

<p>(ID 0471) Report of <i>Atherigona orientalis</i> (Diptera: Muscidae) in mainland France: a very polyphagous and unregulated pest fly</p> <p>As part of the surveillance targeting of the fruit fly <i>Bactrocera dorsalis</i>, about 40 Diptera larvae were collected from pepper plants, in October 2022 in the Var French department and addressed to the ANSES Plant Health Laboratory for detection of <i>B. dorsalis</i>. The morphological and molecular analysis of these larvae made it possible to highlight the presence of six species and, in particular, the species <i>Atherigona orientalis</i> (four larvae), which has been reported for the first time in metropolitan France. <i>Atherigona orientalis</i> is extremely polyphagous. It is mainly saprophagous and usually associated with decaying plant material, but it can also cause primary damage to various plants. The presence of <i>Atherigona orientalis</i>, saprophagous usually associated with decaying plant material with primary damage to various plants, was found in metropolitan France in 2022 and follows a previous report from Spain in 2017.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN ANSES/France	Other	Y	Y	Y	N	The issue is emerging and requires continuous monitoring to understand its origin, potential spread and impact.
<p>(ID 0465) Spread of <i>Burkholderia pseudomallei</i></p> <p>For the first time, the Gram-negative bacteria <i>Burkholderia pseudomallei</i> has been identified in soil and water samples in the USA. This microorganism can cause melioidosis in humans and its presence in the country may signal a potential expansion to new territories, including Europe, posing a threat to plants, animals and people. While most melioidosis cases in the US have been reported in individuals who recently travelled to endemic areas, the mortality rate even with proper treatment remains at around 10%, increasing to as high as 40% in the absence of treatment. Given increasing globalisation and movement of people, it is important to understand the establishment and persistence of this species in non-endemic environments. However, there is currently no evidence to suggest that food plays a significant role in the transmission of this infection.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN DFI/Hungary	Biological hazard	Y	N	Y	N	Additional information and, in the best case, a surveillance programme is needed to keep track of the potential spread of <i>Burkholderia pseudomallei</i> in North America and Europe.
<p>(ID 0486) Blue algae proliferation</p>						



Blue-green algae, also called cyanobacteria, are a group of photosynthetic prokaryotes. This bacterium can occur in fresh or marine water and produce toxins leading to death of animals from drinking contaminated water. They prefer still, warm, nutrient-rich water with light wind and they can proliferate during summer and autumn when stagnation of water and sufficient nutrient concentrations, especially nitrogen and phosphorus, are present. Many major fish die-offs have been reported, probably due to the impact of toxins or suffocation. Predisposing husbandry practices attribute cattle as most sometimes impacted. Some symptoms have already been described in humans after exposure (non-lethal symptoms such as allergic reactions, gastroenteritis, headaches, nausea, painful diarrhoea and dizziness). Environmental factors such as changes in temperature, nutrients and fertilisers can increase the concentration of cyanobacteria. However, it is difficult to establish a direct link between the concentration of cyanobacteria and their toxicity.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN FSAI/Ireland	Chemical hazard	NC	NC	Y	NC	More information is needed about national cases attributed to exposure to blue algae.

(ID 0463) Oder River fish die-off

In August 2022, a massive fish die-off in the River Oder took place. The most probable cause of the fish die-off in the River Oder is the rapid rise in salinity, which, together with other factors, led to the mass proliferation of a brackish water alga that is poisonous to fish. In addition to fish, other aquatic organisms such as snails and mussels also died. The actual extent of the environmental damage and the long-term effects on the ecosystem cannot be quantified at this time. The brackish water alga *Prymnesium parvum* produces a toxic substance that is fatal to fish and other aquatic organisms. At the same time, the experts had to leave the cause of the unnaturally high salinity open due to a lack of available information. It is also unclear how the brackish water alga, normally found in coastal waters, found its way inland.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN EFSA & BVL/Germany	Chemical hazard	NC	N	Y	N	More information is needed on the causes of the Oder fish die-off (climate change, potash mining and high salinity) to fully evaluate the issue. Monitoring of the events is also needed.

(ID 0464) Tara flour as potential cause of illness

Tara seeds are the fruit of a leguminous tree native to Peru. They have recently gained popularity in North America as a plant-based source of protein. Tara gum (E417) is commonly used as a food additive to stabilise or thicken products and is authorised in the EU. However, since June 2022, over 470 cases have been reported in the US in connection with products that contain tara flour. Symptoms reported by those affected typically included gastrointestinal issues and abnormal liver function. Although the exact reason for the toxicity has not yet been identified, it is plausible that contamination



during production might have played a role. It is also suspected that baikian, an organic compound found in tara flour, may be a contributing factor to these adverse effects.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN DFI/Hungary	Chemical hazard	NC	NC	NC	NC	It is currently not clear whether this is a one-off contamination event or tara flour itself poses an emerging food safety risk via some as-yet unidentified toxin/contaminant. Monitoring the presence of this flour on the EU market and collection of data on causative agent is needed.

(ID 0466) Analysis of samples of explosives excavated from the Baltic Sea floor

Following World War II, explosive conventional and chemical ammunition was disposed of in the ocean, which has resulted in the corrosion and breakdown of munition shells, increasing the likelihood of explosives being released into the marine ecosystem. This has led to the exposure of various organisms to the medium toxicity of explosives. Additionally, indigenous soil microorganisms and earthworms are also at risk. The toxic explosive compounds from a dumpsite in the Baltic Sea are being accumulated by flatfish, which could potentially pose a threat to the health of fish and human food safety. However, the impact on aquatic organisms, especially edible fish, remains uncertain.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN EFSA/Italy	Chemical hazard	NC	Y	Y	NC	More information is needed on the concentration of explosives in the fish meat to better understand the exposure and a monitoring programme should gather more information to decide which measures need to be taken.

(ID 0468) Insights into the relevance of *Bacillus cytotoxicus* as a food-borne pathogen

Bacillus cytotoxicus is a Gram-positive aerobic organism member of the *Bacillus cereus* group. The occurrence of this thermotolerant bacteria in food is mainly linked to food items containing potato flakes, potato starch or to insect-based products. It is a known hazard, but detection in food is difficult and requires strain-specific identification. Although it is not an emerging risk and the risk to humans may be overestimated because most strains have low toxicity, some findings indicate extremely toxic outlier strains and the impact of drivers such as the circular economy and protein demand make it a potential issue in the future.



Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN The Federal Food Safety and Veterinary Office/Switzerland	Chemical hazard	Y	N	Y	NC	Additional information on the outbreaks and monitoring of the status are needed.
<p>(ID 0475) Perinatal exposure to food-borne inorganic nanoparticles</p> <p>A study published in 2022 (Issa et al., 2022) suggested that chronic dietary exposure of mothers to inorganic nanoparticles may alter the establishment of intestinal homeostasis in fetuses and predispose individuals to the development of immune-related diseases. The study highlights the issue that exposure to these nanoparticles may disrupt the beneficial exchanges of the host-intestinal microbiota and interfere with the intestinal barrier and gut-associated immune system development. As a result, this may impede the induction of oral tolerance, a crucial process of immune unresponsiveness to food antigens, and significantly increase the risk of developing food allergies.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN DFI/Hungary	Chemical hazard	N	N	NC	N	Information on the potential exposure to the fetus and the allergenicity of these compounds is needed.
<p>(ID 0478) <i>Providencia</i> spp. in food</p> <p><i>Providencia</i> spp. are opportunistic and ubiquitous pathogens that have been associated with diarrhoea and urinary tract infections. The occurrence of <i>Providencia</i> spp. in food is still not well known. Both developing and industrialised nations are vulnerable to outbreaks of <i>Providencia</i> spp. Climate change and the consumption of raw food may contribute to an increased exposure to the virus. Consequently, the risk of food-borne infections and outbreaks is expected to rise in the coming years. There have been limited clinical cases in Europe. However, advancements in virus detection technology make it challenging to determine whether the increased exposure is due to better diagnosis or an actual increase in exposure.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN BVL/Germany	Biological hazards	NC	N	NC	N	Further information on the prevalence of <i>Providencia</i> spp. in food and the potential vulnerability of specific population is needed.



(ID 0485) Plasticosis in birds

According to a recent academic paper entitled ‘‘Plasticosis’’: Characterising macro- and microplastic-associated fibrosis in seabird tissues’ (Charlton-Howard et al., 2023), plastic pollution is becoming increasingly prevalent in all environments globally. As plastic emissions continue, exposure of all organisms to plastic is inevitable. The ingestion of plastic has far-reaching and severe consequences, many of which are only just beginning to be fully documented and understood. The study demonstrates the ability of plastic to directly induce severe, organ-wide scar tissue formation or ‘plasticosis’ in wild, free-living animals. The scar tissue formation is reportedly widespread and likely chronic, leading to potentially irreversible changes in tissue structure and function in the seabirds studied.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN FSAI/Ireland	Chemical hazard	NC	NC	NC	NC	Additional information on the degradation of plastics within living organisms and their biological absorption, distribution, elimination and toxicity is needed.

(ID 0420) Raw meat-based diet for pets

According to a recent report from the Animal and Plant Agency, there has been a significant rise in the amount of *Salmonella* found in raw meat-based diet (RMBD) pet food in the UK. This has raised concerns about the possibility of *Salmonella* being transmitted from pets to humans. The report also highlights the presence of multidrug-resistant (MDR) *Salmonella* strains, including those that are resistant to critically important antimicrobials, in dogs, cats and raw pet food, which is a particularly alarming finding. The shedding of pathogens by animals fed by raw diets might have an impact on animal and high-risk or vulnerable populations and the environment, especially if proper hygiene measures are not followed.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
StaDG-ER Federation of Veterinarians of Europe	Biological hazard	NC	NC	NC	NC	EREN recommendations: 1. Need to collect more data both from microbiological monitoring of RMBD and targeted and systematic monitoring of households to understand the extent of human exposure and to quantify the human health hazards of raw feeding. 2. In order to avoid animal and human health risks, besides revising the current EU ABP regulation to set more stringent microbiological requirements for RMBD producers.



						<p>StaDG-ER recommendations:</p> <ol style="list-style-type: none"> 1. Action to improve in this sector aspects related to risk communications and risk management. 2. Need to collect more studies and data to assess a potential spillover of Multiple drug resistance (MDR) <i>Salmonella</i> strains, including those resistant to critically important antimicrobials, to livestock. 3. Further research is recommended.
<p>(ID 0453) Sesame seeds: update</p> <p>Sesame seeds can be contaminated with microbiological pathogens like <i>Salmonella</i> and several countries used ethylene oxide for decontamination. However, the use of ethylene oxide has been banned in the EU because of its carcinogenic and reprotoxic effects. In several non-EU countries, the use of ethylene oxide is allowed and, hence, products imported into the EU can contain residues or contaminants. Simultaneously, there have been several <i>Salmonella</i> outbreaks and European Rapid Alert System for Food and Feed (RASFF) notifications linked to sesame seeds and sesame seed products. To date, no alternatives to ethylene oxide have been discovered.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN BVL/Germany	Biological and chemical hazard	NC	NC	NC	NC	Better understanding of the efficacy of treatment by alternative decontamination methods is needed.
<p>(ID 0291) Usutu viruses – update</p> <p>Usutu virus is transmitted to birds by <i>Culex</i> mosquitoes. It has been demonstrated that mammalian species could also be infected. They are considered a dead-end host with mainly asymptomatic forms of the infection. There is evidence suggesting an increase in the dissemination of Usutu viruses in France in 2023 with 30 cases reported in birds, which is considered a signal of potential zoonotic risk. Usutu virus will induce massive mortality in wild avifauna (especially in blackbirds, grey owls and house sparrows). The issue may need further information in support of emerging risk categorisation but certainly requires continuous monitoring to understand the epidemiological cycle and the potential drivers of this disease.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
EREN ANSES/France	Biological hazard	NC	N	Y	Y	The issue may need further information in support for emerging risk categorisation but certainly requires



						continuous monitoring to understand the epidemiological cycle and the potential drivers of this disease.
<p>(ID 0473) Concerns on the risk of food contamination by bisphenol A (BPA) through its release from micro- and nano-plastics in soil and irrigation water</p> <p>Water constitutes a possible route of exposure of BPA via the release from micro- and nano-plastics. BPA is degraded by microflora in the environment (water and soil) and has been detected in groundwater, surface water and agricultural soils. Studies have demonstrated that BPA can be taken up and accumulated by edible crops such as lettuce (<i>Lactuca sativa</i>) and collards (<i>Brassica oleracea</i>) through irrigation with reclaimed water and exerts negative effects in the roots of soybean seedlings. BPA can also be released in the marine environment through microplastics. Between November 2021 and December 2022, microplastics were found in all monitored rivers and streams of the Italian Alpine region of South Tyrol, which demonstrates that microplastics can be found in sparsely populated and non-industrialised areas. The obligation to test BPA in water has been in force since 2021 and thus its presence in surface and deep-water bodies has not yet been assessed at the European level. Delays in the establishment of monitoring plans in the Member States and the choice of analytical methods has contributed to the absence of BPA testing in water. Testing of BPA in soil is not obligatory in the EU. The transmission of BPA through micro- and nano-plastic has not yet been assessed and may pose a risk to human health in the future.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
StaDG-ER Safe Food Advocacy Europe (SAFE)	Chemical hazard	N	N	Y	N	StaDG-ER recommendation: <ol style="list-style-type: none"> 1. It was suggested that BPA is included in the list of contaminants for environmental monitoring. 2. The amount of old polycarbonate plastics containing BPA that is currently part of micro- and nano-plastics present in the environment should be assessed in the future. 3. To share the briefing note and information with EREN.
<p>(ID 0474) Potential occurrence of primary sensitisation allergies in insect products and consumer information</p> <p>EFSA's opinion on the use of certain insects for human consumption pointed out the danger of potential primary sensitisation allergies in insect products (EFSA NDA Panel, 2021). This is caused by proteins present on the carapace, such as hexamerin-2, which are common to insects and other species with exoskeletons, such as crustaceans (Wang et al., 2022; Pener, 2014). In addition to dehydrated insect meal, these proteins are also found in insect products such as honey (Martins et al., 2010). The recent authorisation of the use of insect meal in food and feed does not require that the consumer be warned of this potential danger. Continued exposure to these proteins could lead to an increase in allergies to crustacean proteins in the future, derived from primary sensitisation to insect proteins. The risk could be increased in a population without prior consumption of insects, such as the European population, and in children and sportsmen who consume honey.</p>						



Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
StaDG-ER Safe Food Advocacy Europe	Chemical hazard	Y	N	Y	Y	StaDG-ER recommendation: to share with EREN at next meeting.

(ID 0483) Impact of the effect of climate change on food security and trade patterns for grains/oilseeds/pulses as a driver to quality and safety issues

The effect of climate change might impact food security and trade patterns for grains/oilseeds/pulses in an unpredictable way throughout altered capacity to produce and deliver food and feed of minimum quality and safety standards. A decreased trend on grains and oilseeds yields and an increased prevalence and co-occurrence of mycotoxins have been suggested by data collected from COCERAL. The group identify horizon-scanning principles as the way forward to anticipate climate change impacts including 360-degree perception analysis on policies (e.g. EU protein strategy, Green Deal, Farm to Fork) new technologies (genetically modified resistant crops) and other influencing factors.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
StaDG-ER COCERAL	Other	Y	N	Y	N	The discussions on this issue raised crucial questions about the redistribution of production, its impact on the overall food security of European agriculture, and the ability to produce enough to meet demand.

(ID 0484) Aichivirus (AiV) as a potential cause of gastroenteritis outbreaks

Aichi viruses, which are members of the *Kobuvirus* genus (Picornaviridae family), include six species, namely *Aichivirus* A–F. *Aichi* virus 1 (AiV-1) is a type of *Aichivirus* A which infects humans. Other types of *Aichivirus* A, and other species of *Aichivirus* (B–F) have been isolated from a range of animals including companion animals, livestock and wildlife (ICTV, 2024). Although PCR methods are available to detect AiV, its impact on human health may be underestimated due to subclinical infections which do not require medical attention (Chen et al., 2021). The incidence of AiV in cohort studies has been reported to be 0.9–4.1%, mainly when studying outbreaks of diarrhoea in children or young adults, and co-infection with other viruses is not uncommon (50–80% of AiV-infected cases) (Bergallo et al., 2017). However, other studies have reported contrasting results. In Spain, a study found that 58.1% of diarrhoeic outpatients were positive only for AiV (Rivadulla et al., 2019). In China, AiV was found in faeces from both asymptomatic children and children without gastroenteritis, while statistical correlation between AiV infection and gastroenteritis (prevalence 2.8% vs 0.87%) was not found (Li et al., 2017). Different results have been reported in Japan, Germany, France and Spain, in which seroprevalence higher than 80% of patients older than 40 years old was found (Rivadulla and Romalde, 2020; Yamashita et al., 1993; Oh et al., 2006; Goyer et al., 2008; Ribes et al., 2010), while in Taiwan, seroprevalence was found to be lower (Chen et al., 2021). Oysters were implicated in AiV outbreaks in Japan, Germany and France during the period 1987–2007. AiV



has also been detected in mussels, oysters, cockles and clams (Rivadulla and Romalde, 2020). In a study investigating the survival of AiV in commercially available cranberry-based juice, hepatitis A virus demonstrated greater survival than AiV in refrigerated storage (4°C) over 21 days (Sewlikar and D'Souza, 2017). Furthermore, AiV has been detected in raw and treated sewage, surface water and groundwater (Rivadulla and Romalde, 2020), which may cause potential transmission of AiV to food via water.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
StaDG-ER (1) Institute of Environmental Science and Research, New Zealand (2) New Zealand Food Safety (Ministry of Primary Industries, New Zealand)	Biological hazard	Y	N			StaDG-ER recommendations: 1. Prioritise resources on monitoring such microorganisms. 2. Research is needed to ascertain whether AiV virus can replicate in humans. 3. EFSA to communicate with the European Centre for Disease Prevention and Control to be informed to what extent AiV is captured by the weekly monitoring system. 4. Share the issue with EREN at the next meeting.

Risk associated with the increase in consumption of *Amanita muscaria*

Following the outlawing of psilocybin-containing mushrooms, an increased quantity of *Amanita* species has been reported to be sold and consumed in Europe. Between 1 July and 31 December 2022, 1,923 cases of poisoning were reported to the Poison Control Centre in France. Among these cases, 30 people had used smartphone identification apps, compared with six people in 2021 (ANSES, 2023). Consumption of gummies, powders, tinctures and capsules containing *Amanita muscaria* extracts in the USA is raising concerns from the US Food and Drug Administration in the absence of clinical trials. EU legislation is clear to protect consumers from mushroom poisoning. This issue is therefore considered an enforcement problem.

Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
StaDG-ER Association of Veterinary Consultants	Chemical hazard	Y	N			StaDG-ER recommendations: 1. To share the issue with EREN at its next meeting. 2. To collect information from the EFSA's Knowledge, Innovation and Partnership Management (KNOW) unit on



						the use of apps to identify fungi and the potential problems with new regulations.
<p>Allergens in alternative food packaging, trending foods and alternative proteins</p> <p>New Zealand food safety institutions have raised awareness of allergens present in food packaging, trending foods, alternative proteins and the increase in recognised allergenic conditions. Precautionary allergen labelling requirements are similar between the EU, New Zealand and Australia. The desire to reduce environmental impact through sustainable packaging has increased the potential for allergens to be present in packaging materials made from food by-products, and the need to ensure that these proteins do not transfer onto food or hands during the lifespan of the packaging. The presence of allergens in trending foods (e.g. chia and hemp seeds) was discussed, introducing the concepts of cross-reactivity between foods (e.g. chia/sesame or hemp/hazelnut) and pre-sensitisation (e.g. eating hemp and smoking marijuana increase sensitivity to other food allergens). Allergens in alternative proteins (e.g. silk moth larvae, pea protein and mealworms) were presented as well. A quick overview of alpha-gal syndrome and pollen food allergy syndrome, two increasingly recognised allergenic conditions, was given.</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
StaDG-ER Institute of Environmental Science and Research (ESR)	Chemical hazard	Y	N	N	N	StaDG-ER recommendations: 1. Pollen food allergy syndrome awareness was highlighted as the common elicitors (e.g. kiwi, peach and melon) have their risk history in Europe. 2. Pre-sensitisation of developing alpha-gal syndrome after being bitten by a tick will be further explored with EREN by creating a briefing note.
<p>(ID 0482) Global spread of rat lungworm (<i>Angiostrongylus cantonensis</i>)</p> <p><i>Angiostrongylus cantonensis</i> is a parasitic nematode which causes neuroangiostrongyliasis (NA, rat lungworm disease). In the natural life cycle of <i>A. cantonensis</i>, rats are definitive hosts and snails or slugs are intermediate hosts. Some accidental hosts are paratenic hosts which may acquire the infectious stage 3 larvae (L3) but do not support further development. Examples of paratenic hosts of <i>A. cantonensis</i> include freshwater prawns, frogs, toads, land crabs, flatworms and centipedes (Cowie et al., 2022). Humans are accidental, dead-end hosts (Cowie, 2013) and the main (suspected) vehicles of food-borne infection are fresh vegetables containing infected snails/slugs (or parts of them) and paratenic hosts such as prawns and shrimp (Cowie et al., 2022; Federspiel et al., 2020). However, there is no evidence that <i>A. cantonensis</i> can reproduce and multiply in humans. Although <i>A. cantonensis</i> was confined to tropical and sub-tropical zones (Cowie et al., 2022), the parasite was detected in rodents in the Canary Islands, hedgehogs in the Mediterranean and rats in continental Spain (Paredes-Esquivel et al., 2023; Galán-Puchades et al., 2022). Modelling the impact of climate change on the habitat suitability of <i>A. cantonensis</i> under various scenarios showed that it will reduce the total geographic area of most suitable climatic conditions during the coming decades, while the total suitable habitat of the parasite will increase further north and south of the equator, extending into Europe</p>						



<p>and New Zealand. Global dispersion of rat lungworms is facilitated by travel of infected rats (and snails) by ship and thus transferring the parasite between continents and countries (Galán-Puchades et al., 2022). The rapid, global spread of the giant African land snail, <i>Achatina fulica</i> (sometimes referred to as <i>Lissachatina fulica</i>), has also been suggested as a key factor in the spread of <i>A. cantonensis</i> but it is not well supported (Cowie, 2013).</p>						
Author	Classification	New driver ^(c)	New hazard ^(c)	New/ increased exposure ^(c)	New/ susceptible group ^(c)	Recommendations of the emerging risk knowledge networks ^(d)
<p>StaDG-ER</p> <p>Institute of Environmental Science and Research (ESR), New Zealand</p>	<p>Biological hazard</p>	<p>N</p>	<p>N</p>	<p>Y</p>	<p>N</p>	<p>StaDG-ER recommendations:</p> <ol style="list-style-type: none"> 1. ESR to collect information on the possibility that cats and dogs could be a source of transmission of <i>A. cantonensis</i>. 2. Additional data are required on water chlorination and pasteurisation as effective measures to control the spread of the parasite. 3. Further research is needed to investigate the risk of water or the possible transmission through faeces or raw meat from infected animals. 4. To share with EREN at next meeting. <p>EREN recommendation: Monitor huge snails sold as pets on the internet.</p>

(a): Each issue is presented using a standard briefing note template and given a unique identifier number (ID No.).

(b): Classification by hazard and/or driver: biological hazard, chemical hazard, illegal activity, new consumer trends, new process or technology, other.

(c): Yes (Y), No (N), Not concluded (NC).

(d): The conclusions and recommendations were produced and adopted by EREN and StaDG-ER as indicated. They may not be considered as EFSA's view and position as regards the issues addressed, subject to the rights of the authors.

Table 7: Other signals/items proposed/identified by EREN members but not resulting in briefing notes

Title	Survey
Super(?)foods and Supplements –Risky or Healthy?	29th (3–4 May)
Foodborne Tick-Borne Encephalitis in Europe	
Germany to ban exports of harmful pesticides	
Vitamin D intoxication and severe hypercalcaemia – nutritional supplement misuse	
Sustainability and healthiness of plant-based products	
Epidemiology of a major honeybee pathogen, deformed wing virus: potential worldwide replacement of genotype A by genotype B	
Harmful algal blooms – Alaskan tribes join together	
Population genomics confirms acquisition of drug-resistant <i>Aspergillus fumigatus</i> infection by humans from the environment	
Arcobacter risk to the food industry and human health	
Cocoa roasting – new trend in chocolate-making	
New risks of dicamba weedkiller have been found	
Food fraud increasing	
Laser-extracted cold-brew coffee	
Lead in eggs from hens in city backyards raises urban farming concerns	
Natural bioactive compounds from food waste: toxicity and safety concerns	
New studies on β -N-methylamino-L-alanine (BMAA)	
Occurrence of toxic metals and metalloids in muscle and liver of Italian heavy pigs and potential health risk associated with dietary exposure	
Reapproval of cypermethrin	
Reapproval of difenoconazole	
Lactic acid isolated from food waste	
Lamination of cast hemp paper with bio-based plastics for sustainable packaging	
Rise in pesticides in European fruit and vegetables	
SARS-CoV-2 can persist for more than a month on frozen berries	
Assessment of dietary intake of iodine and risk of iodine deficiency in children with classical galactosaemia on dietary treatment	30th (21–22 November)
Studies assess per-and poly fluoroalkyl substances, OPEs and plasticisers in paper and board	
Researchers explore the link between iron supplementation and Parkinson’s progression	
Cows that ate hemp produced milk with THC and cannabidiol	
Food from the trash can: will dumpster diving soon be legal?	
Bee-harming pesticide use given emergency authorisation	
Lead and cadmium found in dark chocolate by a study of consumer reports	
Bee-free honey developed via precision fermentation	
Functional food from waste	
Upcycled animal feed: sustainable solution to orange peel waste	
Home canning predisposes Italy to botulism infections	

Flu that spread from wild birds to mink in Spain raising global alarm	
New unknown virus identified in France	
University students converting grass to edible starch	
Researcher explores using peanut skins in food, livestock feed	
Global SPREAD of MCR-producing <i>Salmonella enterica</i> isolates	
Incredible edible food wrapper	
A new tick-borne disease is killing cattle in the US	
Start-ups brew up fermented alternatives to unsustainable palm oil	
Bacteriophages in foods	
New evidence that ultra-processed foods may increase cancer risk	
Identification and evaluation of (non-)intentionally added substances in post-consumer recyclates and their toxicological classification	
Erythritol linked to heart attack and stroke	

After EFSA’s pre-assessment of signals submitted as potential emerging risks, not enough evidence was identified to support a Briefing Note.

4 Emerging risk identification activities reported by the knowledge networks

4.1 Methodologies

4.1.1 FoodDrinkEurope update on ‘Integration of NAMs in food safety risk assessment’

The representative of FoodDrinkEurope presented a paper related to the adoption of new approach methodologies (NAMs) in food safety risk assessment. The position paper advocated for the integration of NAMs into scientific and regulatory risk assessments and emphasised their capability to enhance the quality of data available in food safety assessment. In addition, the paper called for more flexibility in EFSA’s guidance documents on the use of appropriate fit-for-purpose NAMs within a regulatory framework. Further, it stressed the necessity of establishing a regulatory environment conducive to innovation within the food sector. The paper concluded by underlining the significance of forming partnerships with stakeholders to advance the implementation of NAMs and to provide a platform for feedback on the most recent guidance and pilot programmes for integrating NAMs into risk assessment processes.

4.1.2 Anticipation of food safety and fraud issues: Import Screening for the Anticipation of Food Risks – monitoring food prices and commodity flows

An external speaker from the Bavarian State Office for Health and Food Safety presented the early warning system Import Screening for the Anticipation of Food Risks (ISAR). It was developed by the Bavarian Health and Food Safety Authority to facilitate the methodical tracking of the movement and pricing of imported food commodities. The system underscored the importance of a comprehensive view of the agri-food chain for better anticipation of health risks and fraudulent practices as well as the need to implement multidisciplinary approaches and cooperation among food safety authorities and other bodies to tackle complex challenges. A case study assessing the impact of the Ukraine war on the agri-food chain illustrated ISAR’s utility for the identification of potential emerging risks.

4.1.3 EEA–EFSA collaboration on One Health and possible implications for EREN

The European Environment Agency (EEA)'s EREN representative delivered a presentation highlighting the One Health Interagency Task Force, showcasing an example of how stronger interagency collaboration can enhance recommendations on antimicrobial resistance. The presentation provided an overview of the policy framework on One Health at both global and European levels, including main strategies, action plans, cross-cutting issues and thematic areas.

4.1.4 VIBE: update

The Food Standards Australia New Zealand EREN observer presented the Australia New Zealand Food Standard Code in combination with the concept of the Vigilance and Intelligence Before Food Issues Emerge (VIBE). A few examples were given on the signals collected within the VIBE system, e.g. *Listeria monocytogenes* in enoki mushrooms, patulin in apple juice and the food safety aspects of cell-based foods.

4.1.5 Trends and early signals in the food chain

The Hungarian EREN representative shared their experience of implementing semi-automated systems to capture and analyse signals within the food chain as potentially relevant for the ERI process, highlighting the importance of early warnings and professional expertise in signal selection.

4.1.6 Open a new window in enhanced veterinary clinical decision-making

The Belgian EREN representative delivered a presentation that covered different methodological aspects of the clinical decision-making process in a contextual, continuous and evolving process where data are gathered, interpreted and evaluated, in order to select an evidence-based choice of action. It was mentioned that investigating estimated sensitivity and specificity can offer solid criteria for assessing the effectiveness in decision-making, including options for improvement.

4.2 Projects

4.2.1 EFSCM: mapping the risks and vulnerabilities in the EU food supply chain

The representative of the Federation of Veterinarians of Europe presented the objectives, activities and first outcomes of the European Food Supply Crisis Committee (EFSCM) that was created as part of the contingency plan for the COVID-19 pandemic. The Committee's aim is to set recommendations to improve preparedness. Among the Committee's activities was the creation of a dashboard on food supply and security. The first step, mapping risks and vulnerabilities, was the subject of a public consultation. Different kinds of drivers – short-term and long-term impacts that can affect the food supply chain – were detected and the possibility of creating an app to monitor food supply and food security based on risks and vulnerabilities was also being considered.

4.2.2 Livestock biosecurity definitions

The Belgian EREN representative presented a survey under COST funding CA20103, the objective of which was the study of existing definitions of biosecurity and identified areas of agreement among stakeholders, accounting for the social demographic characteristics of respondents. Statistical analysis and keyword consolidation were used to determine the level of agreement across eight specific definitions. It was noted that the study's methodology and

Short title

findings can be applied to other areas, particularly for developing and consolidating definitions related to emerging risk.

4.2.3 HOLiFOOD

The Hungarian EREN representative presented the HOLiFOOD project⁸, which is a European project aiming to introduce a holistic approach to assess food system risks. Three supply chains were included in the study to generate adaptive models: the poultry, maize and lentils supply chains. HOLiFOOD will apply artificial intelligence and big data analytics to develop a systems approach to enable the early identification of upcoming known and unknown hazards to human, animal and environmental health along the different selected supply chains.

4.2.4 FoodSafeR: update

An update on FoodSafeR9, a European project launched in October 2022, was presented by the Irish EREN representative and EFSA. More specifically, the architecture of FoodSafeR was showcased and the connection with EFSA's emerging risk workflow and new Emerging Risks Exchange Platform (REAP) was clarified.

4.2.5 Influenza D viruses

The Belgian EREN representative presented the development of a project supported by EFSA on an integrated approach to assess the emergence threat associated with influenza D viruses circulating in Europe. Discussion took place on the work packages of the project that were linked to the evaluation of the diversity, sensitivity and specificity of influenza D detection methods, the genetic diversity of the virus in Europe and the risk assessment of the virus introduction on a farm or in a country.

4.2.6 Food safety threats associated with conflict

The Irish EREN representative shared information on a task force set up to monitor the impacts of the conflict in Ukraine. A threats matrix on 14 or 15 threats across the food and feed fields was developed within this initiative and the example of a threat was illustrated linked to the idea of intentional or unintentional contamination of the food chain through hybrid threats.

4.2.7 Potential risks related to functional food and nutraceuticals

The Portuguese EREN member presented the status and regulation of functional foods and nutraceuticals, and their associated health claims in Europe. During the discussions it was stated that EFSA's remit does not include the risk management area.

4.2.8 WHO: update

The representative from WHO presented the WHO Global Strategy for Food Safety, highlighting key priorities and indicators for success, emphasising the importance of collaboration and coordination among different sectors and international organisations. More specifically, the global strategy's objectives consist of strengthening national food controls systems, identifying and responding to food safety challenges resulting from the transformation and global changes in food systems transformation, increasing the use of food chain information, scientific evidence

⁸ <https://holifoodproject.eu/approach/>

⁹ <https://foodsaferr.com/>

and risk assessment in the process of risk management, strengthening stakeholder engagement and risk communication and promoting food safety as an essential component in domestic, regional and international trade. Additionally, the role of INFOSAN in the area of emerging risks was highlighted.

4.2.9 Thematic session on water scarcity

EREN's Food and Agriculture Organization (FAO) representative delivered a presentation on water scarcity as a driver of food-borne disease risk, focusing on the several dimensions of water scarcity that can be summarised as follows: (i) scarcity in the availability of fresh water of acceptable quality with respect to aggregated demand, in the simple case of physical water shortage; (ii) scarcity in access to water services, because of the failure of institutions in place to ensure a reliable supply of water to users; (iii) scarcity due to the lack of adequate infrastructure, irrespective of the level of water resources, due to financial constraints. The presentation highlighted the issue of water as part of One Health, explaining the nexus of water–energy–food. Several drivers for water scarcity issues, such as the rising global population and urbanisation, were discussed as they relate to food safety. The presentation also considered both the quantity and quality of water in food processes and production. Additionally, the concept of fit-for-purpose was explained, emphasising the need for a risk-based approach to safe water by assessing its appropriateness for the intended use with the use of a risk matrix based on risk factors. Moreover, the emergence of new technologies in the area of water treatment should be on our radar.

The following emerging risks associated with water scarcity were identified as an outcome of the discussions that took place after this presentation among EREN members:

- the use of water of questionable quality for food production and processing purposes may be a driver for microbiological and chemical risks;
- chemical contamination with various combinations (e.g. nitrates, endocrine disruptors);
- plant and animal diseases associated with water quantity and quality.

5 Emerging risk identification methodologies and data collection by EFSA

One of the main objectives of EFSA's activities on emerging risks is to develop and improve ERI methodologies and approaches. Collecting further data and information on identified issues is an important step in EFSA's ERI process. Several projects are being developed by EFSA in collaboration with partner organisations ('Article 36 organisations') for the collection of data and to explore methodologies to identify emerging risks.

5.1 EFSA's emerging risk identification workflow and the Emerging Risks Analysis Platform

EFSA has conducted an info-technological analysis and developed blueprints for a future centralised platform, ERAP. The platform is designed to integrate EFSA's new workflow for emerging risks, supporting the identification and characterisation of these risks. The design and development phase has been initiated to integrate this platform with established customer relationship management system. Additionally, plans were set in place for user acceptance testing and training, with the goal of implementing the platform in phases starting in 2024.

5.2 Food Fraud project: update

This project involves the development of a computational model for the identification of food fraud incidents raising food safety concerns for consumers. The project started in January 2022 and will last until February 2025. In 2023, the contractor followed a methodological approach to select reliable and publicly accessible data sources on food fraud incidents and labelled the data 'yes/no' as being relevant to food safety to create binary files that served the development and consequent delivery of the computational model. EFSA is currently assessing the relevance of the outcomes from running the computational model with new data regularly provided by Joint Research Centre and European Commission's public sources. The next steps in the process are to analyse proposals for the contractor on potential methods to identify emerging risks, focusing on the developed computational model, specifically the weighting and logistic regression methods.

5.3 Food and feed from tomorrow's oceans (Ocean Project)

EFSA run a foresight project, 'Future challenges for the safety of food and feed from the oceans'. The objectives of the project are:

- 1 to look at the future uses of the oceans and their resources, and discuss the possible relevance for EFSA's preparedness to future challenges for food and feed safety and risk assessment, in a context of global changes;
- 2 to identify and characterise emerging risks for the safety of food and feed from the oceans.

Following a multicriteria participatory prioritisation exercise, scenarios were produced for sea transport and trade, aquaculture, and coastal and open sea-bed mining. In these three areas, a workshop was envisaged in 2024 with the aim of identifying:

- potential implications (including emerging risks) for the safety of food and feed from the oceans;
- elements and considerations useful for risk-benefit assessments of eating food and feed from the oceans; and
- the implications, challenges and opportunities for Europe's sustainability objectives.

5.4 EuroCigua II project: update

Building on the EuroCigua project and the established expert network, and stimulated by the outcome of the CLEFSA project (which identified ciguatoxins as key emerging risks linked to climate change) a follow-up activity was started in August 2022: Eurocigua II¹⁰ – An integrated approach to assess the human health risks of ciguatoxins in Europe. It will end in October 2025. Eurocigua II comprises 11 international organisations, five Member States, EFSA, the European Centre for Disease Prevention and Control, EEA, the European Commission, FAO and the Intergovernmental Oceanographic Commission of UNESCO. The objectives of this projects are: environmental data collection; modelling, predicting and mapping the emergence of ciguatoxins in fish in Canary Islands hotspots under climate change; production of reference material for chemical analysis, development of analytical methods, harmonisation and capacity building; collection of case/outbreak data; strengthening the reporting and notification of ciguatera outbreaks; investigating the contribution of imported fish to ciguatera fish poisoning

¹⁰ <https://www.sanidad.gob.es/en/areas/sanidadExterior/euroCiguaII/proyecto/home.htm>

outbreaks/cases. The collected data will complement and integrate those collected during the EuroCigua project.

5.5 Emerging risk identification in food supplements: update

EFSA provided a brief update on the core concept of the project, which is centred on the establishment of a knowledge community focused on food supplements other than vitamins and minerals. The project is driven by two primary goals: (1) to analyse possible emerging risks from European (nutri)vigilance and monitoring systems as well as other accessible sources, such as Toxinfo collections or alerts from poison centres; and (2) to investigate whether plant-based substances listed in the EFSA Compendium on Botanicals that are predicted to be toxic are included in some food supplements, and signal whether they could be a health concern for EU consumers.

Initially, the project was set to be outsourced through an EFSA grant in 2023 but it was later limited for that path. As an alternative solution, the Secretariat investigated the feasibility of conducting this activity under the EFSA-supported tailor-made activities of the focal points, given the interest expressed in the topic by Member States. This approach was ultimately accepted and adopted.

5.6 Emerging chemical risk identification – the SCREENER project: update

EFSA run a project, 'Screening for emerging chemical risks in the food chain' (SCREENER), which started in 2021 and ends in 2024 in collaboration with WFSR, UCT Prague and Fraunhofer ITEM.

The SCREENER project is a follow-up of previous EFSA projects in which a list of 212 chemicals were prioritised from the list of chemicals registered under the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation. The SCREENER project aims to carry out an in-depth evaluation of those 212 REACH chemicals, and additional substances detected in food samples with a focus on halogenated organic chemicals not included in the previous list. The reason to identify the latter chemicals was to identify substances potentially introduced into the food chain unintentionally through industrial and anthropogenic activities, which were previously unrecognised in the food chain. Multiresidue high-resolution mass spectrometry-based analytical methods were developed and validated for qualitative screening of the above-mentioned chemicals in plant- and animal-based matrices: wheat flour, carrots, kale, potatoes, peas, strawberries, oranges, chicken, pork, beef, trout, herring, salmon, cow milk and hen eggs. Furthermore, the detection of the halogenated organic chemicals was performed through non-target analysis in the same food items. Subsequently, 15 chemicals (12 REACH chemicals and three halogenated organic compounds) were prioritised for quantitative analysis which was carried out in the same samples. The rest of the REACH chemicals from the list of the initial 212 prioritised chemicals were excluded mainly due to reactivity or insolubility in common extraction solvents or unavailability of commercial analytical standards for purchase. Finally, hazard characterisation, exposure assessment and risk characterisation were performed for these 15 chemicals.

5.7 Future Food and Feed Lab workshop

The Future of Food and Feed Lab, which was a 1.5-day engagement event of EFSA's activity on ensuring preparedness for the safety of new food, feed sources and new production technologies, was presented by EFSA. The Lab was held in Milan in March 2023 and its aim was the assessment

of weak signals identified within this activity and identify any potential additional signals in the aforementioned areas. The participants of this Lab came from the private sector, EU institutions, NGOs and academia and divided into four groups dedicated to four different scientific fields: nanotechnology, cell culture-derived meat, edible insects and novel feed. The outcome of the Lab fed into EFSA's Scientific Colloquium on cell culture-derived foods and food ingredients.

5.8 Colloquium on cell culture-derived foods and food ingredients

EFSA presented the outcomes of their Scientific Colloquium 'Cell culture-derived foods and food ingredients' (EFSA, 2024) that took place in May 2023 in Brussels and was attended by stakeholders from all over the world.

6 Networking and international cooperation

Exchange of information and knowledge is a key priority of the EFSA strategy for ERI. EFSA knowledge networks are not limited to EREN and StaDG-ER but include EFSA's units, EFSA's networks, EFSA's Panels and the Scientific Committees, Member State national scientific networks, European institutions and international organisations. Data are shared between EFSA knowledge networks and the European Commission for the collection of additional information and communication of identified issues. All outputs (technical reports, meeting agendas and minutes and annual activity reports) are available on the EFSA website's emerging risks page¹¹. Presentations to EFSA Panels and the Scientific Committee during plenary meetings to discuss potential emerging risks are regularly organised. In addition, a series of collaboration and dissemination activities were organised in 2023. They included:

- EUFORA 2023: Within the European Food Risk Assessment Fellowship Programme (EUFORA) a presentation was delivered on EFSA's procedures of identification of emerging risks that included EFSA's ERI system, EFSA's network of knowledge, a presentation of selected emerging risks and also projects in the field of the development of methodologies for the detection of potential emerging risks/emerging issues/weak signals and drivers.
- Global forum for animal feed and feed regulators (Rome, 14–15 November 2023): the Forum brought together international experts, including government officials, researchers and industry leaders from several continents to discuss animal nutrition and feed in the context of a sustainable livestock transformation. EFSA took part in a moderated panel discussion focusing on developments and challenges of the feed sector, relevant to EFSA's current work, with particular emphasis on circular feed sources.
- In the context of the EFSA project, 'Future challenges for the safety of food and feed from the oceans: a foresight study' (Oceans project), a knowledge network was built comprising EEA, the European Fisheries Control Agency, the European Maritime Safety Agency, the Joint Research Centre, the Directorate-General for Health and Food Safety and the Directorate-General for Maritime Affairs and Fisheries. The network has provided relevant information on future ocean uses and practices that might drive the emergence of risks for the safety of food and feed from the oceans.
- In the context of climate change, EFSA has contributed to the April 2023/2 Eurofish magazine describing how seafood safety faces added risks from climate change. A podcast was produced (Episode 7 – Climate change: what it means for food safety).

¹¹ <https://www.efsa.europa.eu/en/topics/topic/emerging-risks>

- In the context of its foresight activities, EFSA has participated in the European Strategy and Policy Analysis System horizon-scanning sense-making workshops. EFSA also participated in the fifth (Lisbon, 20–21 April) and sixth (online, 29 November) meeting of the EU Agencies Network on Scientific Advice futures cluster.
- EFSA also participated in the FAO foresight technical meeting on new food sources and food production systems (NFPS). The technical meeting, held from 13 to 17 November 2023 at FAO's headquarters in Rome, looked at opportunities and challenges in terms of food safety issues brought for agri-food systems by three NFPS: plant-based foods, new applications of precision fermentation and 3D food printing. These were selected because of their future potential for growth, and because of their impact at multiple levels including economic, environmental, social and nutritional.
- In the context of EFSA's preparedness, the role of the Knowledge Innovation and Partnership Management Unit was introduced at the sixth meeting of the EFSA Stakeholder Forum 2023 (Brussels, 10 November 2023). A key aspect introduced was the environmental scanning process, aimed at identifying trends in food and feed safety, plant and animal health and environmental aspects. It is also a single entry point for collecting signals that could trigger various actions, including updating guidance documents, addressing ongoing initiatives and alerting the European Commission.
- Acknowledging the need for a collaborative approach to identifying and analysing emerging food safety hazards, EFSA has participated in the FoodSafeR Living Lab 2 aiming to create a digital hub for information-sharing and collaboration with international experts. The event took place on 23 and 24 November 2023 and was hosted by the FSAI in Dublin, Ireland. Thirty-five participants were part of the Living Lab from 19 countries and regions and 20 organisations. Future interconnection between FoodSafeR and other research projects such as HOLIFOOD should be considered, as it would cross-feed the digital hub with AI-based tools for emerging risk identification, introducing a holistic approach to tackling food system risks in a changing global environment.
- The year 2023 marked the launch of EFSA's newsletter *Emerging Risks Update*, with its first issue released in November. This newsletter serves as a strategic platform for timely dissemination of specialised information and offers networking opportunities within the field of emerging risks. It provides valuable insights into the key discussions and developments that take place during the EREN and StaDG-ER meetings. In addition to featuring recent news and publications, the newsletter highlights forthcoming events and activities pertinent to environmental scanning, thereby keeping stakeholders informed and engaged.

7 Conclusions and recommendations

The year 2023 has consisted of further implementing the environmental scanning and strategic options definition process created in 2022 and comprised two workflows. The first workflow, designed for the identification and analysis of emerging risks, is already in place and running with the contribution of the EREN and the StaDG-ER; the ERAP, initiated in 2022 and intended to centralise all emerging risk analysis activities, has been further developed in 2023 with a minimum viable product ready to be tested early in 2024. The second (and new) workflow is designed to deal with horizon-scanning and identification of broader issues in the areas of food and feed safety, plant health and animal health that could impact EFSA's work programme or strategy. Acknowledging the breadth and variety of the scientific areas to be covered, special effort has been spent in 2023 to put a collaborative network in place that goes beyond just the European Member States and stakeholders. The exchange of information with the ERI System



of the New Zealand Institute of Environmental Science and Research, or the greater interaction with the FAO Food Safety Foresight programme are just two examples of such expansion of EFSA's environmental scanning network beyond EU borders.

In addition to building up this collaborative network for preparedness, EFSA has worked in 2023 at increasing the visibility of its environmental scanning activities. This has been done by actively participating in the Horizon2020-funded FoodSafeR project and making use of its digital hub to report to a worldwide community of professionals working at proactively identifying and managing emerging risks on EFSA activities and identified issues. The year 2023 has also seen the creation of EFSA's newsletter *Emerging Risks Update* with the first issue published in November 2023. Intended to provide valuable insights into some of the key discussions and developments in the EREN and StaDG-ER meetings, the newsletter provides also recent news and publications, along with upcoming events and activities related to environmental scanning.

Priorities for 2024 are: (i) the finalisation of the ERAP platform so that it can be used for day-to-day activities by EFSA, EREN and StaDG-ER; and (ii) the implementation of the various steps of the horizon-scanning workflow so that identified weak signals, drivers and trends are further characterised and their relevance for EFSA's work programme and strategy can be assessed.

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Glossary

Driver	Generally, the energy providing impetus to a development. In futures research, drivers are frequently referred to as internal/external factors influencing developments, decisions, policies etc., helping to define possible future scenarios. Often used in parallel to, or overlapping with, the term 'trend', but a driver can be observed as having a direct or indirect impact on the system while a trend reflects 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.
Emerging issue	An issue that could be a food or feed safety risk that has very recently been identified and merits further investigation, and for which the information collected is still too limited to be able to assess whether it meets the requirements of an emerging risk. Thus, emerging issues are identified at the beginning of the emerging risks identification process as subjects that merit further investigation and additional data collection. Emerging issues can include specific issues (e.g. a specific chemical substance or pathogen, or a specific susceptible group of the population), as well as general issues, called drivers (e.g. climate change), that could result in emerging risks.
Emerging risk	An 'emerging risk' to human, animal or plant health and the environment is understood as a risk resulting from a newly identified hazard to which significant exposure may occur or from an unexpected new or increased significant exposure or susceptibility to a known hazard.
Weak signal	Unclear observable trends or patterns that warn of the possibility of future events and illustrate potential future developments (i.e. emerging issues) for which only limited and scattered evidence is currently available in the food/feed landscape

Abbreviations

ANME	Association of Natural Medicine in Europe
AiV	Aichivirus
ANSES	French Agency for Food, Environmental and Occupational Health and Safety
ASF	African Swine Fever
AVC	Association of Veterinary Consultant
CBD	Cannabidiol
CEFIC	European Chemical Industry Council
ARG	antibiotic resistance gene
BPA	bisphenol A

Short title

COGECA	EU agri cooperatives
COPA	EU farmers
COST	European Cooperation in Science and Technology
DFI	Digital Food Institute
EC	European Commission
EEA	European Environment Agency
EFSA	European Food Safety Authority
EHDV	epizootic haemorrhagic disease virus
ERAP	Emerging Risks Analysis Platform
EREN	Emerging Risks Exchange Network
ERI	emerging risk identification
EU	European Union
EUFORA	European Food Risk Assessment Fellowship Programme
FAO	Food and Agriculture Organisation
FESASS	European Federation for Animal Health and Sanitary Security
FSANZ	Food Standards Australia New Zealand
FVE	Federation of Veterinarians of Europe
FAI	Food Safety Authority of Ireland
GABA	gamma-aminobutyric acid
MS	Member State
ISAR	Import Screening for the Anticipation of Food Risks
MDR	multidrug resistant
NC	not Concluded
NGO	Non-Governmental Organisation
PFP	The Primary Food Processors of the EU
SAFE	Safe Food Advocacy Europe
PFAS	Per- and polyfluoroalkyl substances
REACH	registration, evaluation, authorisation and restriction of chemicals
RMBD	raw meat-based diet
StaDG-ER	Stakeholder Discussion Group on Emerging Risks

Short title

UK	United Kingdom
VIBE	Vigilance and intelligence before food issues emerge
WHO	World Health Organization