



**EMERGING  
RISK  
IDENTIFICATION  
SYSTEM**  
Enhancing Food Safety in New Zealand

# Signals

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## The excitement when strands of research converge

Foods can contain small quantities of compounds reported to be good for health. Interest in these bioactive compounds is not new. They are often extracted and concentrated into supplements. Due to a desire to create a circular food economy, researchers are evaluating food by-products as alternative sources of bioactives. Low value food by-products, which might end up as waste, become valuable. Researchers hope to boost the health appeal of foods by using by-product extracts as food ingredients.

For bioactives to have an effect in the body, they need to remain stable on the shelf and during eating, and be bioavailable at the right point along the gastrointestinal tract. This is hard to achieve when the bioactive is a food ingredient. Advances in nanotechnology enable researchers to create or control nano-

sized particles. This has opened the door to nanoencapsulation, where tiny structures can be used to protect bioactive molecules, then present them to the body at the right time. These nano-suitcases can even mask unpleasant tastes.

This convergence of scientific threads, driven by consumer desires, sustainability goals and scientific curiosity, offers new food formulation opportunities. The scientific literature is alight with exciting research results, but are there emerging food safety risks? Very few authors comment on this aspect. An assessment of risks is required for market approval, usually after there has been considerable investment. In the excitement of progress we must always ask if there are risks.

Reviews: [Siddiqui et al. \(2023\)](#) and [Pateiro et al. \(2021\)](#)

## News from the network

The European Food Safety Authority (EFSA) considered a range of emerging risks at their November network meetings. Among the topics discussed, concerns were raised over the potential for increased foodborne exposure to known hazards. Examples included toxin-forming cyanobacteria, rare earth elements (see page 2) and the hallucinogenic (but potentially deadly) mushroom *Amanita muscaria*. Internationally, fungi-related food safety issues were a hot topic in 2023, with incidents of contaminated enoki mushrooms and mushroom poisoning being reported, but these might be considered emerged risks.

Also emerged is the risk of foodborne infection from the rat lungworm parasite. However, new information shows this parasite is now endemic on the European mainland, so represents an emerging risk in this region (see page 2).

The annual report of Food Standards Australia New Zealand includes a summary of emerging issues considered by agency staff during 2022/23. Topics included possible risks from recycled or bio-based food packaging, or from cell-based meat.

Further information: [EFSA meetings](#) or [FSANZ annual report](#)

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## Summary of activities

Identified this quarter were

- 9 emerging issues concerning food or the food industry.
- Signals prompting updates to 12 identified emerging risks.
- 56 signals that did not meet the requirement of being a foodborne emerging risk to human health.

The ERIS Action Forum will decide if they want to undertake actions on these signals or identified emerging issues.

## Featured emerging risks and issues

**Food contamination from rare earth elements.** Rare earth elements are crucial to the functioning of modern day electronics, including mobile phones and electric cars. They can also be in fertilisers. There are 17 elements in this group (atomic numbers 21, 39 and 57-71). There is concern that the increased use of rare earth elements in electronic devices, and the discarding of these devices (particularly personal devices), could increase the concentrations of these elements in the environment, where they could enter the food supply.

**Global spread of rat lungworm.** A parasitic nematode, *Angiostrongylus cantonensis*, causes a disease in humans that affects the central nervous system and can be fatal. The parasite uses rats and snails/slugs to complete its life-cycle. Humans are accidental, dead-end hosts and can become infected if they eat food contaminated with *A. cantonensis* larvae, e.g. infected snails in leafy green vegetables, larvae in prawns and crabs. Since it was first described almost

90 years ago, this parasite has spread across the world but has mainly been confined to tropical and sub-tropical zones, including eastern Australia. More recently, it has been detected in mainland Europe. With a warming climate, it is expected that the parasite will continue to migrate away from the equator.

**Food and feed treatments to reduce mycotoxins.** The growth of fungi capable of producing mycotoxins is a spoilage issue in both food and animal feed, and can become a health issue. The development of methods to reduce these toxins is not new and some are already permitted under regional regulations (including in New Zealand). These are intended to complement good management along the food and feed chains. Recent scientific publications document the efficacy of novel mycotoxin reduction methods but scarcely consider whether there are unintended food safety consequences. This issue was raised through ERIS to prompt discussion in a New Zealand context and identify safety research needs.

## Some other observations

- Food Standards Australia New Zealand (FSANZ) is assessing its first application for approval of a cultured meat. The novel food uses cultured quail cells.
- Interest is growing in protein-rich foods produced from fungi (mycoprotein). A range of fungal species can be cultured, potentially using food by-products as a substrate. There is particular interest in species that can produce a large biomass of protein-rich mycelia.
- Unilever has allowed industry partners to freely access 12 patents to create icecream that remains stable at  $-12^{\circ}\text{C}$  rather than  $-18^{\circ}\text{C}$ , reducing the energy needed to run freezers. This change is important for research on pathogen survival in icecream.
- Some edible oils are produced using solvent extraction rather than pressing. Research to provide the bio-oil industry with more environmentally friendly alternatives to petroleum-based solvents is underway. There are still challenges and safety is being considered.

[Link to FSANZ news and A1269](#)

[Link to a mycoprotein review \(Wang et al.\)](#)

[Link to a mycoprotein example \(Bartholomai et al.\)](#)

[Link to Unilever announcement](#)

[Link to a green solvent review \(Usman et al.\)](#)

## The NZFSSRC member organisations funding ERIS are:

