

## **EMERGING RISK IDENTIFICATION SYSTEM (ERIS)**

### **Report from the second Emerging Risk Identification Panel Meeting**

### **May 2022**

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The voluntary participants in the Emerging Risk Identification Panel Meeting were acting in their capacity as independent experts and not as representatives of their employers or in the interests of the organisations funding ERIS.

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## Abbreviations

ERIS	Emerging Risk Identification System
NZFSSRC	New Zealand Food Safety Science & Research Centre
MPI	Ministry for Primary Industries
NZFS	New Zealand Food Safety
ESR	Institute of Environmental Science and Research

## Acknowledgements

We are very grateful to those who volunteered their time to join the Identification Panel's second meeting, and for their valuable contributions during and after this meeting.

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## 1. INTRODUCTION

New Zealand's food industry is not just focussed on research that improves food safety now, but also research that will improve their ability to reduce or avoid future food safety risks. Horizon scanning is needed to identify these emerging food safety risks. While many individual food companies carry out some form of horizon scanning, only a few companies have systematic processes in place that link their scanning efforts to research planning. A review undertaken during 2017/18 identified the need for a systematic horizon scanning system that could identify emerging food safety risks, and then support the food industry to take action.<sup>1</sup>

Consequently, nine food industry organisations and New Zealand Food Safety (NZFS), through the New Zealand Food Safety Science & Research Centre (NZFSSRC), agreed to fund the establishment and implementation of a food safety horizon scanning system. The system is called the Emerging Risk Identification System (ERIS) and is funded for two years until March 2023.

ERIS has the goal of identifying both acute emerging food safety risks and those which may potentially pose a challenge to the New Zealand food industry sometime in the future. The core purpose of ERIS is to provide information which will help the food industry prioritise their food safety research, but the design also helps the food industry respond quickly to acute issues.

The structure of ERIS has two pillars:

1. Gathering intelligence on emerging food safety issues and risks.
2. Supporting decision-making over future research.

This ensures that intelligence is turned into action.

The 2017/18 research, which included investigating existing food safety horizon scanning systems in other countries, identified people as the best source of intelligence on emerging food safety risks. ERIS has been designed as an expert centred system, with intelligence from people complemented by information gathered from other sources. Human networks are at the core.

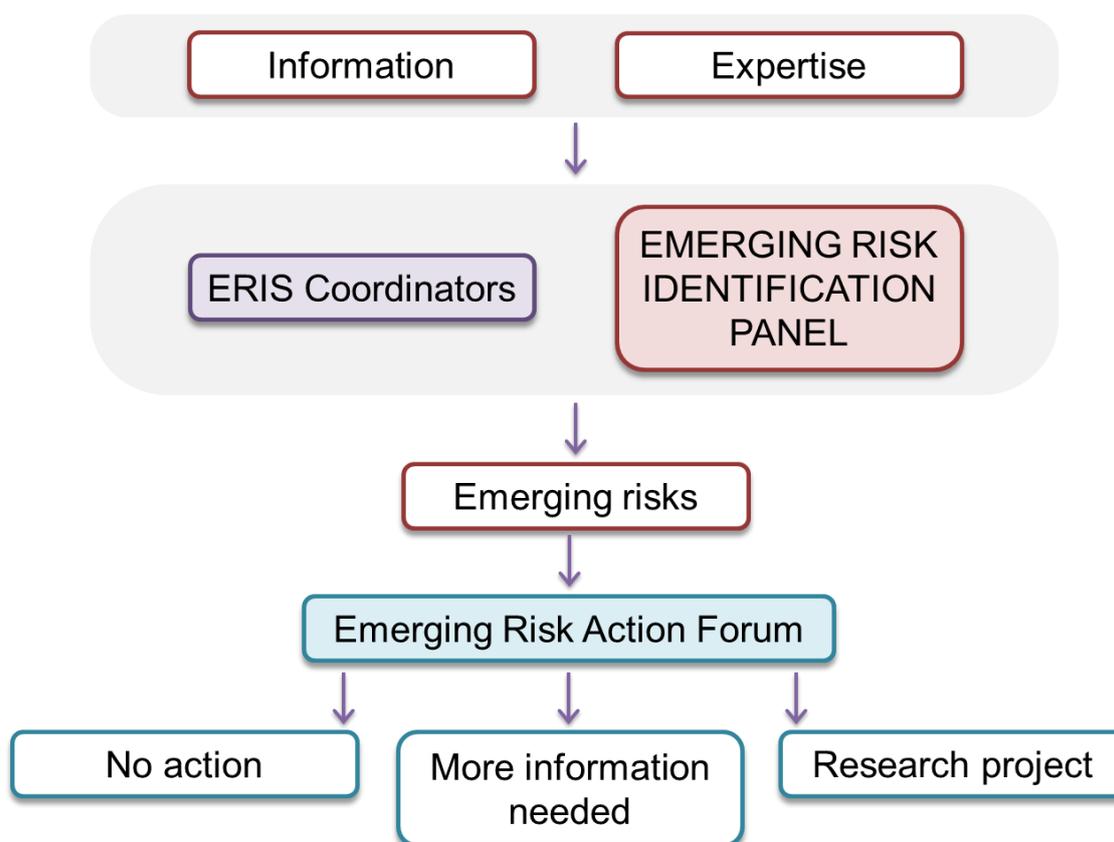
The Emerging Risk Identification Panel is a key part of intelligence gathering (Figure 1). The intent of this Panel is to bring people together from different expertise areas, allowing them to combine their observations and ideas towards the common goal of identifying emerging food safety risks. Those in the Panel are from a range of disciplines, many only loosely connected to food safety (Appendix A). This allows us to consider changes happening outside the food safety space that might introduce new food safety risks: If you mix people with similar expertise you will get similar views. When you mix people from different disciplines together you can get a much richer picture.

The goal of this Panel is:

*To improve New Zealand's ability to proactively identify and manage food safety risks by combining intelligence and identifying emerging food safety risks, as part of the NZFSSRC Emerging Risk Identification System (ERIS).*

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<sup>1</sup> King N, Martin-Neuninger R, Ho H and Brightwell G (2018) Dynamic scanning for emerging food safety risks and opportunities for the food industry: Learning from established horizon scanning systems and proposing a way forward for New Zealand. New Zealand Food Safety Science & Research Centre. [https://www.nzfssrc.org.nz/assets/Project-Reports/Dynamic-scanning-for-emerging-food-safety-risks-and-opportunities-for-the-food-industry\\_final-report.pdf](https://www.nzfssrc.org.nz/assets/Project-Reports/Dynamic-scanning-for-emerging-food-safety-risks-and-opportunities-for-the-food-industry_final-report.pdf)



**Figure 1. The core structure of ERIS**

Information from people and other sources is gathered by the ERIS Coordinators. The Emerging Risk Identification Panel draws from their own networks and observations to bring information into ERIS. Identified emerging risks are assessed by the Emerging Risk Action Forum, which is formed from the ERIS funders and is the primary decision-making group. Information on emerging risks is also made available to other NZFSSRC members as needed, and those in the Emerging Risk Identification Panel.

## 2. MEETING SUMMARY

The meeting was held in two parts, each a one-hour session on the 16<sup>th</sup> and 24<sup>th</sup> of May, 2022. Nineteen people attended Part One and sixteen people attended Part Two, alongside five people associated with ERIS operations. The agenda and supporting material for the meetings are in Appendix B. The meetings were held through video conferencing (Teams) with the support of an online whiteboard platform (Miro).

At the first session, Nicola King welcomed participants with a karakia, then introduced Cath McLeod as the Panel Chair. Nicola King then spoke to a short presentation, outlining:

- The ERIS system and the role of the Identification Panel.
- The scope for ERIS, the focus being on hazards in food or drink that could cause adverse health effects in humans.
- The expectations for the meeting in terms of outcomes and participation.

Attendees were then given a tour of the whiteboards and a demonstration of the basic tools before starting their first activity. Over a period of six minutes, all attendees were able to write notes on their whiteboard, describing any observations they wanted to share that related to the topic of emerging food safety risks. Prompting questions were provided as part of the meeting material to guide thinking (Appendix B). Some time was then dedicated to talking through each note added so that all attendees had time to see the full range of ideas and observations. Attendees then had another six minutes to add further observations or questions that related to existing notes, or new observations. The session concluded with a karakia.

In between sessions, the Coordinators compressed the whiteboard contributions into 21 issues, some quite specific to foods and hazards, others broad (Section 3). All Panel members, whether they were present at the first session or not, were invited to choose up to five issues based on what they thought was important:

*“We all use different ways to decide what is important and we are not going to guide you (or hold you to account!). Simply react: Which of these issues do you think we should be paying attention to? Where do you think our food industry is most exposed to something bad happening?”*

Based on the votes received, three issues became the focus of discussion in the second session.

At the second session, Cath McLeod welcomed participants with a karakia. Nicola King briefly summarised the first session and presented the results of the survey, then discussion commenced on the three selected issues (Section 4). Nicola presented her screen to the participants and scribed the discussion points into the presentation as they were discussed. The session concluded with a karakia.

The next meeting is expected to be during November 2022.

### 3. IDENTIFIED FOOD SAFETY ISSUES

The ERIS Coordinators extracted twenty-one food safety issues from the whiteboard notes generated by the Identification Panel members at the first session. These issues and related comments are listed below. Note that this list simply represents the observations shared at the meeting without consideration of any current research activities or existing risk management.

1. The human health risks from nanoparticles in foods.
2. Potential for allergens to be present in foods made from emerging plant proteins.
3. Food safety risks arising from consumers being increasingly unable to purchase food (because of economic pressures at the consumer level) .
  - Food shortages in the home could pressure people to consume food that is not safe.
  - Increased consumption of wild foods without knowledge of how to manage risks.
  - Increased home production/preservation of foods without knowledge of how to manage risks (e.g., pesticide exposure, botulism).
4. Food safety risks arising when food suppliers face supply chain issues.
  - Food shortages and supply issues could lead to substitution (food fraud, allergens).
5. The emergence of *Vibrio* spp. in NZ seafood.
  - Detection of highly virulent strain(s) in NZ.
  - The number of reported illnesses from seafood containing pathogenic *Vibrio parahaemolyticus* bacteria continues to increase with links to a range of consumption of seafood (not just bivalve shellfish).
6. Food safety risks from parasites in New Zealand.
  - *Ascaris* infection identified in a young person who had not travelled outside of NZ.
  - There is increasing evidence of zoonotic strains of *Cryptosporidium* spp. and *Giardia* spp. amongst human cases. Is foodborne transmission important?
7. Food safety risks from non-O157 Shiga toxin-producing *Escherichia coli* (including serotypes that are not in the “top 7”).
8. The emergence of new *Salmonella enterica* ssp. *enterica* serotypes via food and animal feed.
  - Emerging serotypes: Bovismorbificans, Give, Enteritidis.
  - Emerging clusters of serotypes Enteritidis and Typhimurium identified by whole genome sequencing.
  - Increasing incidence of salmonellosis cases in companion animals (cats and dogs), noting that these serotypes are the same as those emerging in cattle (Give and Bovismorbificans) and are suspected to be from raw food diets. They pose a risk for food safety during food preparation in the house or handling of raw pet foods.
  - Are pets and humans being infected by the same source?

9. Food safety risks associated with biological products being used on food crops.
  - Increased use of non-registered biological products on crops in the last three years.
10. Food safety risks arising from methane inhibitors being given to cattle (directly or via feed).
11. New animal reservoirs (wildlife and/or domestic) of zoonotic pathogens and the potential for foodborne transmission.
  - Risk of SARS-CoV-2 in deer or other wild animals.
12. Climate change-related risks of NZ seafood being contaminated with toxins from algae.
  - Warming oceans drive range extension of certain harmful algal bloom species.
  - How long before cases of ciguatera poisoning are locally-derived?
13. Climate change related risks of imported and domestically-produced grains/cereals being contaminated with toxins from fungi (mycotoxins).
  - The potential for very wet grain harvest in NZ.
  - *Fusarium* contamination of grain presents a mycotoxin risk for specialty grains in niche markets.
  - Different regions may be impacted more than others (some arable regions are predicted to become drier).
14. Harvesting native plants for Rongoā (medicines): Potential changes to hazard exposure because of climate change.
15. Food safety risks arising from new processing technologies (e.g., microwave assisted extraction).
16. Increasing concern over pyrrolizidine alkaloids in foods as a result of improved food testing methods.
17. Food safety risks arising when plasticisers are no longer tolerated in food packaging.
  - Decreased exposure limits (e.g., bisphenol A) will mean that almost any occurrence will become an issue.
18. Changes in regulatory standards for agrichemicals and sanitisers: Is there a flow-on effect that increases the prevalence of another food safety hazard?
  - Changes to regulations for an agrichemical control without safer alternatives being available.
  - Trying to resolve one issue can lead to another, e.g., the removal of a sanitiser due to concerns over residues can increase the risk of microbial contamination.
  - Sustainability is driving a reduction in the use of pesticides but we do not always know the impact on animal and plant health, stress and food safety when their use is restricted.
19. Food safety risks due to loss of food integrity (e.g., food fraud, food provenance).

20. Chronic conditions arising from long-term exposure to hazards in foods.

- Oestrogen mimics, glyphosate residues, PFAS, etc.

21. Public education: Risk communication and response to mis/disinformation campaigns.

- New study results on dangers of consumers washing raw poultry and cross-contaminating. Rates as high as 25% of people contaminating their foods.
- Declining trust in science could have implications for testing, emergent risks, and mitigation.
- Popularity of non-science approaches online.
- Citizen Science approaches can lead to inaccuracies in risk perception by public.

A range of other observations were also shared by the Panel. These are listed below with some rationale as to why they were not included in the list above. The Coordinators made the decision over which issues to exclude from the above list.

- The human health risks from microplastics in foods (there is active research underway in NZ and overseas addressing fundamental research needs).
- Increased cases (and geographical spread) of Japanese Encephalitis Virus in Australia (not a foodborne disease).
- An international outbreak of hepatitis among children (cause not identified; foodborne transmission not identified).
- Ongoing cases of yersiniosis in NZ (there is active research underway in NZ to identify transmission routes).
- Increasing difficulty in securing and retaining experts with food safety knowledge in all areas, e.g., regulation, novel foods (not a foodborne hazard).
- Regulatory responses not always keeping pace with emerging food safety concerns and food technologies (not a foodborne hazard).
- Increasing use of non-culture techniques for clinical diagnosis is likely to continue (being actively managed).
- The risk of radiation contamination of imported food from Ukraine (risk is being managed).
- Food safety risks arising from recycled packaging, e.g., non-intentionally added substances (there is an active research programme underway).

## 4. DISCUSSION ON THREE FOOD SAFETY ISSUES

By means of a survey, the Identification Panel members were asked to select up to five issues from the twenty-one identified during the first session, which they viewed as the most important. From the survey results, three issues were selected for discussion in the second session.

Discussion of the three selected food safety issues was guided by two questions posed to the participants:

1. What are the signals?
2. What data gaps prevent us from identifying this emerging risk?

### 4.1 Consumer food insecurity

This topic considers food safety risks arising from consumers being increasingly unable to purchase food. While the focus was on the inability of consumers to purchase food due to economic hardship, the conversation extended to food supply shortages (i.e. foods being unavailable to consumers due to supply chain issues). Economic hardship and shortages in the supply of particular foods might pressure people to source and consume less safe alternatives.

While the potential for this to occur becomes evident through mainstream media reporting, other social indicators are:

- An increased demand for food offered through food rescue or food sharing programs.
- Increased popularity of home production, storage and preservation through social media.
- Increased food exchange occurring through social media.
- Increased sourcing of food from alternative sources using the internet.

However, it was agreed that there were currently very few signals that could provide quantitative evidence of an emerging food safety risk, with these being reliant on public health surveillance:

- An increase in public health notifications where public health units have identified home production, expired foods, wild foods, etc. in case investigations (botulism being one example of a notifiable disease that often triggers questions over consumption of preserved foods).
- An increase in public health notifications of *Vibrio* infection from non-commercially harvested seafood.

Regarding the above, it was raised that people unable to purchase food due to economic hardship could face the same hardship in seeking healthcare, weakening the power of the above signals. Another weakening factor is that severe cases are likely to present at hospitals and the cause of illness might not be identified or reported, particularly for chemical intoxications. For example, sporadic illness among people from other nationalities who have assumed that NZ flora presents the same risk as their native equivalent (plants they traditionally foraged in their home country), when in fact the NZ varieties contain toxic elements (e.g. NZ bracken fern, Chinese sweet pea).

The participants raised several points to highlight potential sources of information that could be used to identify this emerging risk:

- Pesticide residue levels on domestically-produced produce (including shared community gardens). The type and level of chemical residues on home produced foods are not known and this is where there is potentially a higher risk of inappropriate application of chemicals.
- Ensuring that investigations of reported cases with notified diseases typically associated with animal contact (e.g. leptospirosis) include questions over non-commercial food consumption.
- Reduced sales of certain commodities in supermarkets: Investigating whether consumers are sourcing alternative (perhaps less safe) products.
- The approved application of pesticides to control pests in council-managed green spaces where these spaces are also used by the public as a source of wild foods (Council use of pesticides might not be tracked or managed with consideration for food safety). For example, the harvest of wild foods such as pūhā at the roadside may expose consumers to chemical hazards.
- Observations by people who are working in the environment for other purposes, e.g. biosecurity surveillance, fisheries/wildlife officers.
- Observations by people in community centres who are working with people facing higher levels of food insecurity, e.g. Marae, refugee centres.
- Sales of edible plants and seeds from garden centres.

None of the above are currently systematically monitored for the purposes of identifying emerging food safety risks, with the exception of notifiable diseases.

Some discussion of risk management options occurred. The only option for risk management of non-regulated foods is communication. To be effective this needs to be targeted, with engagement through platforms that are relevant to the affected people groups, including using people “on the ground” (see points above).

## 4.2 Mis/disinformation campaigns

This topic considers emerging food safety risks arising as a result of mis/disinformation campaigns. Participants found it difficult to identify particular signals that a risk was emerging, other than monitoring media.

It was agreed that social media is a major source of mis/disinformation. For example, social media is often not a platform for balanced discussion; benefits might be promoted while ignoring risks, or vice versa (e.g., raw milk, fluoridated water, vitamin B12 deficiency/vegan diet). However, social media can provide a useful source of information on emerging dietary trends that might expose consumers to foodborne hazards (or nutritional deficiencies).

Some discussion also centred on mainstream media, which does not always present a balanced view. Less diligent reporters do not interpret scientific reports with a critical view and might draw conclusions from early research, unreviewed papers and selected experts. This discussion extended to consider what science/research makes it to the mainstream or social media. Examples cited were:

- Research presented extremely early, e.g. open access pre-print papers. Risks are highlighted before scientists have had opportunity to research/evaluate fully. These early findings can establish a public opinion on a matter that is difficult to correct as more scientific information becomes available.
- Poor science getting a footing in media alongside good science. Scientific findings shared during the COVID-19 pandemic was provided as an example. Related to this point, it was noted that the standard of peer reviewing is not consistent across science publishing platforms, which makes critical reviews of scientific publications more important than relying solely on peer review as a marker of quality.
- Research supporting emerging diets or highlighting potential foodborne hazards (food scares), without the wider context of risks and benefits.
- Messages considering links between food and chronic health impacts are often unclear; the further out the time horizon of a chronic health effect, the more opportunity for disparate views on the harm/risk.

Currently, neither social media nor the mainstream media in New Zealand are systematically monitored to identify emerging food safety risks. One problem with monitoring these information sources is determining when to act: When is the right time? Or, by extension, at what point is the signal strong enough that adverse health effects might occur as a result of the messaging?

The discussion naturally considered risk management options. Similar to the previous section, unless a regulated food posed a food safety risk, communication was the most important risk management tool, with the goal of providing people with factually correct information on nutrition and risks. Messaging needed to be culturally- and generationally-suitable.

### 4.3 Chronic conditions

This topic considered chronic conditions arising from long-term exposure to hazards in foods. These hazards might be natural components of foods or introduced as a result of food production or preparation. Following the strong discussion on the previous two food safety issues this third issue was only discussed briefly during the meeting due to time constraints. The general feeling from members was that there was much more depth left in the discussion.

Some signals were identified:

- Increased consumption of foods in which hazards are a natural component.
- Increasing concentration of residues over time, as measured by periodic food surveys.
- Epidemiological signals: Do we see a change in disease prevalence and could this be related to food?

A major difficulty is that it is challenging to link chronic food exposure and health end-points, particularly if these conditions could be caused by other factors, e.g. cancer. Our knowledge of long-term toxicity is improving but when a chronic condition is diagnosed can you say the foodborne hazard was the cause?

In contrast to the previous two issues discussed, the scientific literature is currently being monitored to identify emerging food safety risks related to chronic exposures.

## 5. CONCLUDING REMARKS

There were four anticipated outcomes from this meeting:

1. Information towards identifying emerging food safety risks.
2. Identified actual or potential food safety risks.
3. Connections between people/organisations.
4. A public facing meeting report.

It is the view of the ERIS Coordinators that this meeting achieved these outcomes. During session one, there was a significant contribution of comments regarding real and potential food safety issues from the Panel members. The structure of the activities in the meeting allowed members to bring forward their own ideas in a shared space and then encouraged them to connect and build on the ideas of others, linking their different expertise together. The second session provided for three issues to be brought forward for focussed discussion on the types of signals we could look for to identify an emerging food safety risk, and where gaps in our knowledge exist that prevent us from doing this. It is valuable that these three issues were all difficult subject areas, where identifying emerging food safety risks is not easy.

## APPENDIX A. MEMBERS OF THE EMERGING RISK IDENTIFICATION PANEL

Name	Organisation
Cath McLeod (CHAIR)	Cawthron Institute
Brent Kleiss	New Zealand Pork
Gale Brightwell	AgResearch
Dianne Schumacher	Dairy Companies Association of NZ
Roy Biggs	Biggs Food Consultancy Ltd. & Poultry Industry Association of NZ
Graham Fletcher	Plant & Food Research
Tim Harwood	Cawthron (also National Emerging Organic Contaminants Panel)
Siew-Young Quek	Auckland University
Stephen On	Lincoln University
Karen Lau	New Zealand Food Safety (MPI)
Tim Blackmore	Capital & Coast DHB
Shevaun Paine	Institute of Environmental Science and Research
Tom Kiedrzyński	Ministry of Health
Jonathan Watts	Ministry for Primary Industries
Jackie Benschop	Massey University EpiLab
Peter Cressey	Institute of Environmental Science and Research
Phil Bremer	Otago University (also NZFSSRC)
Ivy Gan	Plant & Food Research
Raniera Bassett	New Zealand Food Safety (MPI)
Kevin Taukiri	AgResearch
Jack Keeys	KPMG
Jackie Wright	Institute of Environmental Science and Research
Matthew O'Mullane	Food Standards Australia New Zealand
Roger Cook	New Zealand Food Safety (MPI)
Nigel French	Massey University
Ian Shaw	University of Canterbury
Nicholas Cradock-Henry	Landcare Research
Alison Stewart	Foundation for Arable Research
Grant Verry	The FoodBowl, NZ Food Innovation Network

## APPENDIX B. SUPPORTING INFORMATION FOR MAY 2022 MEETINGS

### PART 1

#### AGENDA

1. Welcome
  - Introductions, Karakia Tīmatanga
2. Introduction to meeting
  - Brief overview of ERIS
  - Summary of November meeting
  - What we are doing at this meeting
3. 6 minute challenge
  - Instructions
  - 6 minute brainstorm
  - Discussion
4. 6 minute response
5. Closing
  - Part 2 (next meeting)
  - Karakia Whakamutunga

#### PRE-MEETING THOUGHT EXERCISE

It is hard to identify hazards that could be emerging food safety risks. The first meeting focussed on themes and drivers that could introduce new food safety risks. This meeting encourages you to apply a new lens across your day-to-day role and to question whether your observations could signal an emerging food safety risk.

#### **Our key question is: What emerging food safety risks have you noticed?**

Have you seen anything that might suggest there could be:

- A new type of hazard being found in food that could affect the health of people?
- A known hazard that is now being found in food?
- An increase in foodborne illness because something has changed?

*Participants were also presented with some prompting questions, below.*

#### PROMPTS

The following statements and questions are only intended to prompt your thinking – you do not need to answer them, nor be limited by the ideas presented here.

There are diseases traditionally only seen in animals that are starting to appear in humans. Foodborne transmission might be possible.

- Have you noticed any diseases that were traditionally only seen in animals that are starting to appear in humans?

There are more functional ingredients being used in foods.

- Are there novel ingredients that we should be concerned about?

Consumers are using social media to learn about food safety risks.

- Are there examples of specific risks people are concerned about?

There are some internationally traded foods that are well-known targets for adulteration/fraud: Olive oil, wine, fish and honey.

- Are there other foods that are becoming increasingly targeted?

There are communicable diseases that are starting to appear more often in people. Foodborne transmission might be possible.

- Have you noticed any diseases that appear more common among people?

Increasing warm periods are expected to increase the shedding of bacterial pathogens from animals.

- Are there specific bacterial species we should be concerned about?

There are communicable diseases that are starting to appear more often in animals. Foodborne transmission to people might be possible.

- Have you noticed any diseases that are increasingly being diagnosed in wild or domesticated animals, perhaps in New Zealand?

In New Zealand, there are chemicals in the environment that could end up in food.

- Is there increasing concern about any specific chemicals?

Currently, laboratory testing of samples from sick people or animals, or food, focuses on known hazards.

- Are there specific hazards that you think we should be testing for?

Internationally, there are concerns that the development of new foods, new food ingredients and new food technologies are outpacing safety considerations.

- Have you noticed rising concerns about a particular food, food ingredient or technology?

Climate change is altering the appearance and timing of environmental cues used by Māori to guide food or medicine gathering.

- Are there specific examples you know about where harvest timing is important for safety?

## PART 2

### AGENDA

1. Welcome
  - Karakia Tīmatanga
2. Summary of last week's meeting (Part 1)
3. Discussion of three emerging issues (see below)
4. Next steps
5. Closing
  - Karakia Whakamutunga

### FOOD SAFETY EMERGING ISSUES FOR DISCUSSION

The three emerging issues we will discuss are:

- CONSUMER FOOD INSECURITY: Food safety risks arising from consumers being increasingly unable to purchase food (*because of economic pressures*)
- PUBLIC EDUCATION: Risk communication and response to mis/disinformation campaigns
- CHRONIC CONDITIONS arising from long-term exposure to hazards in foods

**Two key questions for you to consider for each of these issues are:**

#### What are the signals?

- Is there a change you might see in your area of expertise that might indicate this risk is emerging?
- Are there sources of information that might be used to look for changes?

#### What data gaps prevent us from identifying this emerging risk?

- Who is looking for these signals?
- Are we looking at the wrong signals?

There might be examples we can learn from.

Thank you for your participation.