

**A FOOD SAFETY
SCIENCE PLAN
FOR AOTEAROA
NEW ZEALAND**



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1 / NEW ZEALAND FOOD SAFETY FOREWORD

Food safety is of paramount importance in our economy. A long track record of food excellence underpins the trust in our food system, ensuring consumers' safety, and empowering them to make informed choices.

The need for an all of sector plan to prioritise food safety research, manage risk, and position New Zealand strategically for the future, was identified by the Ministry for Primary Industries and Ministry of Business Innovation and Employment in 2021. MPI contracted the National Food Safety Science and Research Centre to deliver this plan through our Operational Research Fund.

Development of this Plan has been a collaborative effort, with input from across the science community, Māori, government, and industry partners. A wide breadth of input from stakeholders across the sector has allowed for the development of a Plan which represents a shared vision for our country's short- and long-term food safety needs.

We recognise the importance of supporting the safety of food for Māori. Through a genuine partnership, the Plan combines Mātauranga Māori knowledge and practice with western science in a shared framework. This allows us to understand Māori needs and co-develop food safety projects according to Māori aspirations around food.

I would like to personally thank the Steering, Science Leaders and Leadership Groups for their input into the development of the Plan, and acknowledge their commitment to increasing the efficiency of food safety science and the opportunities it presents for New Zealand.

The National Food Safety Science Plan will allow us to identify and manage the critical knowledge gaps in food safety. In addition, the Plan will be a valuable input to the *Te Ara Paerangi - Future Pathways* programme.

As food safety challenges evolve, the Plan will undergo annual review and maintenance to ensure it stays relevant and valuable to researchers, Māori, government and industry. The Plan represents the sectors shared and ongoing commitment to ensuring New Zealand's food safety system remains in a position to achieve the best outcomes for our food and our people.

Vincent Arbuckle

Deputy Director-General, New Zealand Food Safety

2 / INTRODUCTION

Food safety is critical to the welfare of New Zealanders and is central to the prosperity of New Zealand. While consumers generally assume food is safe in New Zealand, there is a constant need to remain vigilant with regard to new risks, the re-emergence of old issues, and ensuring we are able to manage known risks across different contexts: food manufacturing, food service and food preparation in the home.

The food we eat includes products grown and processed domestically, as well as imported products

(NZD \$6.9 billion in 2018¹).

New Zealand's food exports are our largest export sector,

(>80% of what we produce valued at NZD \$32.7 billion in 2018²)

and trust in our food exports is underpinned by a long track record in food safety excellence and the systems and skills that have underpinned this.

Trust however is earned and needs to be protected. What worked successfully yesterday, cannot be assumed to do so tomorrow. As a result, food safety science and the insights, answers and processes it provides enable this trust to be maintained over the long-term and to address the significant issues that remain with respect to food safety.

In this context, New Zealand's food and beverage sector is challenged by environmental and social pressures that may impact on food safety. Examples include the move to holistically sustainable production, changing consumer preferences for packaging and food products, consumer and customer desires for traceability and provenance, a decreasing understanding by consumers of how food is produced, the proximity of horticultural operations to livestock, the impact of climate change and population growth (particularly on water safety and security), and the development of novel foods. In addition, the pool of food safety experts across the academic, research, industry and regulatory spheres is small. These are pan-industry issues that may affect the safety and suitability of a variety of foods, both domestically and in export markets.

¹ Fit for a Better World. Accelerating our economic potential. Ministry for Primary Industries

² A strategy for New Zealand Food Safety, 2019 – 2024. New Zealand Food Safety, Ministry for Primary Industries

Foodborne illness remains a significant issue around the world in terms of health and economic impacts. In 2015 the World Health Organisation (WHO) released a report that assessed the global impact of 31 foodborne hazards, estimating that this resulted in

600 million
foodborne illnesses,
420,000
deaths, and
33 million
disability adjusted life
years' (DALYs) in 2010³.

Norovirus was the leading cause of foodborne illness causing 120 million cases, while *Campylobacter spp.* caused 96 million foodborne illnesses.

In a comprehensive assessment of the economic impact of foodborne outbreaks in New Zealand undertaken in 2010, it was estimated that the total cost allocated to foodborne outbreaks in 2009 was

NZD \$161.9 million⁴

Campylobacteriosis was the most expensive foodborne disease recognised within the New Zealand health system in 2009, amounting to

NZD \$36 million or
27% of all disease-specific costs—followed by salmonellosis (NZD\$15.4 million, 12%) and listeriosis (NZD\$15.2 million, 11%) –

Despite the low incidence of infections, listeriosis has a high cost per case. There is potential for serious complications and high risk of premature death. Norovirus is one of the main vectors of foodborne illness impacting non-commercially (wild and customary) harvested shellfish in New Zealand.

In 2020, the top six pathogens causing foodborne illness in New Zealand were

Campylobacter (5289 notified cases in 2020), ***norovirus***, ***Listeria***, ***Salmonella***, ***Yersinia*** and Shigatoxin-producing ***E. coli***.

Aside from microbiological hazards, illness and market detections can also arise from chemical contaminants, physical contaminants and allergens.

GIVEN THIS DOMESTIC AND INTERNATIONAL CONTEXT THE MISSION OF THE PLAN IS:

To develop knowledge, human capability and tools that will ensure that food produced and consumed in New Zealand is safe for everyone.

3 / PURPOSE OF THE PLAN

THE PLAN'S PURPOSE IS:

To increase the efficiency and impact of food safety science for New Zealand.

It is important New Zealand's food safety reporting and regulatory system is well linked to the science system to ensure that key knowledge gaps regarding the hazards that are causing the most illness and economic loss are identified and effectively managed. It is particularly important to ensure that publicly funded food safety research is prioritised to address the most important food safety issues facing New Zealand. We estimate current investment in food safety science to be approximately \$20 million per annum. This is a relatively small investment in minimising the risk of foodborne illness and the associated economic burden, noting the 2009 annual estimate of total costs of foodborne outbreaks in New Zealand of NZD \$161.9 million.

Currently, no single agency is responsible for ensuring that New Zealand's investment in food safety research spans the range of knowledge gaps that need to be filled, or for ensuring that the research conducted is cost-effective and sufficiently forward looking in its aspirations and scope. The Plan therefore provides an opportunity to align food safety science investment from the food industry with that from government, creating efficiencies and opportunities for collaboration and the development of more strategic outcomes, including investment to ensure New Zealand has the capability and capacity to meet future needs. To ensure that the Plan covers the needs of key users of the science it has been developed in consultation with New Zealand food businesses, existing iwi partners, research providers and Government.

The Plan maps a pathway for food safety science over a five year timeframe, creating a tool to help guide greater focus, impact and coordination in New Zealand's food safety science effort. The plan includes:

Short, medium and long-term priorities for food safety research; and

Guidance on the level of funding needed to support the research priorities.

The scope of the Plan includes science and research relating to the safety of food and beverages for human consumption.

The Plan is designed to be a valuable resource for all people with an interest in food safety to understand where the science priorities lie. It is intended that the Plan be a living document that will provide a focal point to continually consider what the key challenges to the safety of foods are, and discuss and promote the investigation of solutions to overcome these challenges.

Two mātāpono (principles) guided the development of this plan and will be vital in its successful implementation:

1 Whanaungatanga – Collaboration and Connection. We need to work closely together with respect to share our experiences and skills to create opportunities to improve the safety of food.

2 Kaitiakitanga – Guardianship of Food. If food is not safe, and is affected by a problem that may cause harm to people, we must fix it.

4 / THE DEVELOPMENT PROCESS

The plan was facilitated by the New Zealand Food Safety Science and Research Centre with funding provided by the Ministry for Primary Industries. To support the identification of key issues and prioritisation, the Plan has been developed collaboratively with science, Māori, government and industry partners.

This process enabled us to canvass a very wide range of views and to develop a plan that we believe represents a shared vision for the short- and longer-term food safety needs of Aotearoa New Zealand. Critically, this vision, which was developed in partnership with Māori stakeholders, is designed to give active effect to our nation's founding document, Te Tiriti o Waitangi, and incorporates clear processes to enable this. In addition, by involving all stakeholders in the development of the plan we believe this shared vision will give confidence to research providers to invest in human capital capacity and capability development and hence provide much-needed opportunities for emerging researchers to help meet the food safety needs of Aotearoa New Zealand, now and into the future.

The Plan's development was guided by a small 'Steering Group' (Appendix One) to provide guidance on how the plan should be developed (the process), and provide feedback and insights on research themes and priorities, and advice on an ideal funding disbursement system.

- A broader multi-party 'Leadership Group' was also established (Appendix Two). The primary role of the Leadership Group was to provide insight and advice about the key science areas that the Plan should focus on.
- A **Science Leaders Group** (Appendix Three) provided advice on cross-sector concerns and fundamental research needs.
- A broad **Stakeholder Group** (Appendix Four) gave significant input and feedback on the draft themes and research priorities.

The timeline for the development of the Plan which involved four workshops and a survey in 2021 is provided in Appendix Five.

3. Havelaar AH, Kirk MD, Torgerson PR, Gibb HJ, Hald T, et al. (2015) World Health Organization Global Estimates and Regional Comparisons of the Burden of Foodborne Disease in 2010. PLOS Medicine 12(12): e1001923. <https://doi.org/10.1371/journal.pmed.1001923>

4. Gadiel, D. The Economic Cost of Foodborne Disease in New Zealand, Prepared for: New Zealand Food Safety Authority. November 2010.

5 / PARTNERSHIP WITH MĀORI

Through working in genuine partnership with Māori, we aspire to a new way of working together to identify needs and conduct science to support the safety of foods in New Zealand, and the health of our people.

The Plan combines mātauranga Māori knowledge and practice with conventional science in a shared framework across four science themes.

All Themes have implications for Māori (iwi/hapū/whānau/Māori food businesses). The Plan Framework is shown in Figure 1.

Through partnership with Māori it is envisaged that we will:

Learn more about Māori needs and issues in the context of food safety.

Co-develop food safety projects based on the identified needs and aspirations.

Work together to ensure the safety of food.

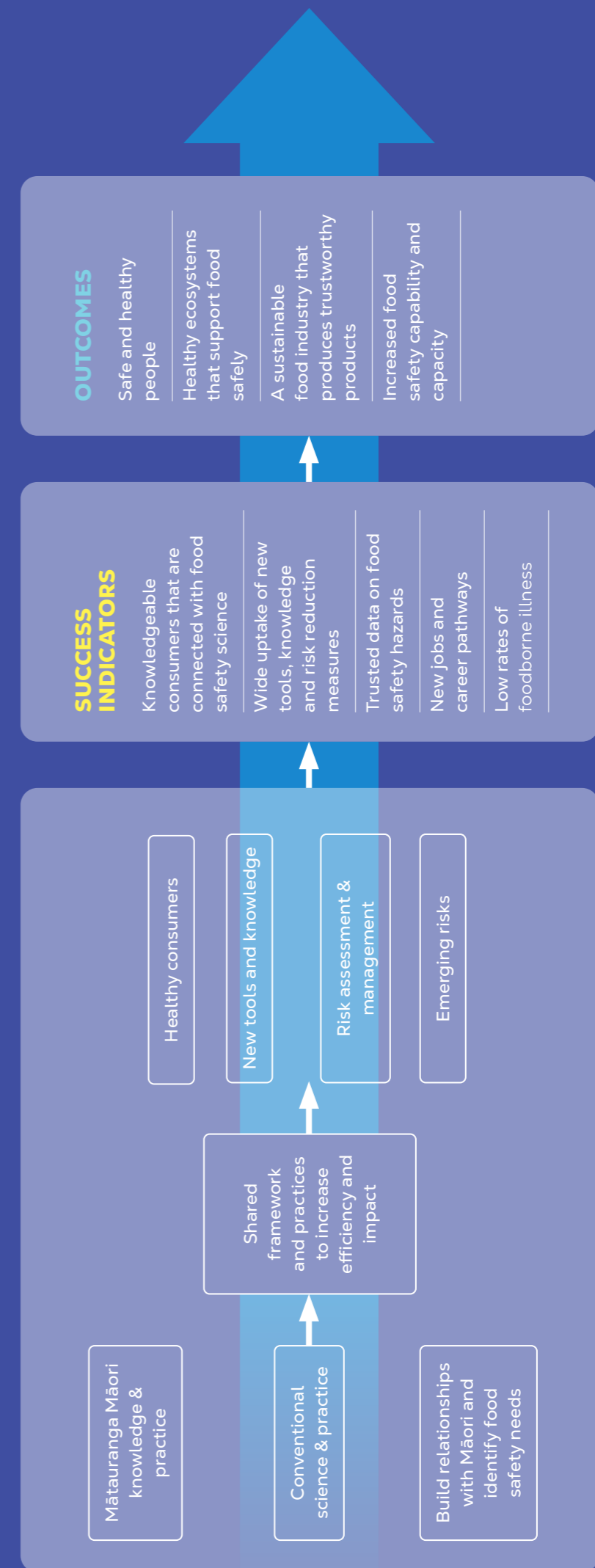
Provide a pathway for whānau, communities and regions to be involved in food safety science.

Build capability to increase our knowledge, generate new jobs and create opportunities for Māori food businesses, and to support safe and sustainable wild or customary harvest activities.

Through the development of this Plan, including the workshops and other interactions, it is proposed that a Kāhui or expert Māori research advisory collective be established to further consider and explore the food safety concerns and aspirations of Māori in more depth. A Kāhui could also help to combine mātauranga Māori and conventional science through the four science themes. The Kāhui will mark a new way of operating in the food safety sphere and will need dedicated resourcing. The Kāhui would consider both the whole Plan, and have greater involvement and oversight of research needs of particular relevance to Māori, including co-leadership and co-development of projects. Consistent with the above, there is an absolute commitment, expressed throughout the Plan, to working in partnership with Māori – but it is recognised that there is more work to be done to ensure that this happens in practice.

Te Māhere Haumaruru Kai: Food Safety Science Framework Genuine Partnership

FIGURE ONE



6 / USING THE PLAN AND ALLOCATING FUNDING

The science community and funding bodies will use the Plan as a reference document to align the key areas in which food safety research is conducted to the priorities identified in the Plan.

These guiding principles are suggested for funding allocation:

1 Funds are used to support research proposals that are well aligned with the research needs articulated in the Plan.

2 Funding decisions are made by a team that includes people with food safety science expertise and expert knowledge of mātauranga Māori.

3 The allocation process involves independent rigorous review of project proposals by a collective of domain subject experts, Māori, food industry and government.

4 Funds are used to support best-fit science teams for projects, which involve collaboration and connection (whanaungatanga) wherever possible and practical.

5 The need to mentor, support and develop expertise and capability in food safety and in the intersections between animal health, food safety and public health.

It is suggested that the funding is allocated following these principles through a national Centre that seeks to align private and public research efforts.

7 / MONITORING AND REVIEW OF THE PLAN

It is important that the Plan is maintained and kept current, particularly with the impact of macro-environmental and social challenges beginning to take their toll, and the increased potential for priorities to shift as new challenges emerge.

It is recommended that this Plan is subject to annual review and that this is facilitated by “a Centre” which is involved in allocating funding. The review process should involve a full range of partners, such as those involved in the development of the Plan, including Māori, consumers, the science community, government and the food industry (Appendices 1 – 4).

It is strongly recommended that as part of the on-going maintenance of the Plan particular emphasis is given to broader discussions with Māori, to gain deeper insights into the concerns and aspirations of a wider group with respect to food safety science and mātauranga. This should be achieved through establishing a Kāhui or expert Māori research advisory collective that is well resourced.

8 / SCIENCE THEMES

A framework has been developed which identifies science **Themes**, under which **Priority Research Needs** are grouped and prioritised. The process used to determine the priority levels, timeframe and cost of each Theme is documented in Appendix Six.

The Themes and Priority Research Needs are intentionally set at a high level that can encompass a variety of research topics/projects. It is envisaged that each Theme will include discrete projects that span fundamental and applied science (also described as the three research horizons: generating new ideas, developing emerging ideas, and leveraging proven ideas). Te Ao Māori needs have been interwoven through the Themes rather than constituting a separate Theme, in recognition of a preference expressed by partners who helped develop the Plan.

The Themes are illustrated in a conceptual framework (Figure 2)

THEME A

Improving consumer and food servers' food safety practices is about improving the food safety practices of those involved in customary and recreational harvesting of food, preparation of meals at home, on marae and in food service businesses.

Proposed investment
\$5-6 million
per annum

THEME B

Cost effective, faster, smarter detection of food safety hazards is about the development, validation and application of new methods and technologies, and new ways to manage, analyse and visualise the data generated to gain insight and predict future food safety outcomes.

Proposed investment
\$5-6 million
per annum



THEME C

Understanding and reducing known food safety risks focuses on formal scientific appraisal of risks from all types of hazards (biological, chemical, physical and allergens) in foods and beverages, and validation of new practices for reducing risks across the food chain.

Proposed investment
\$8-9 million
per annum

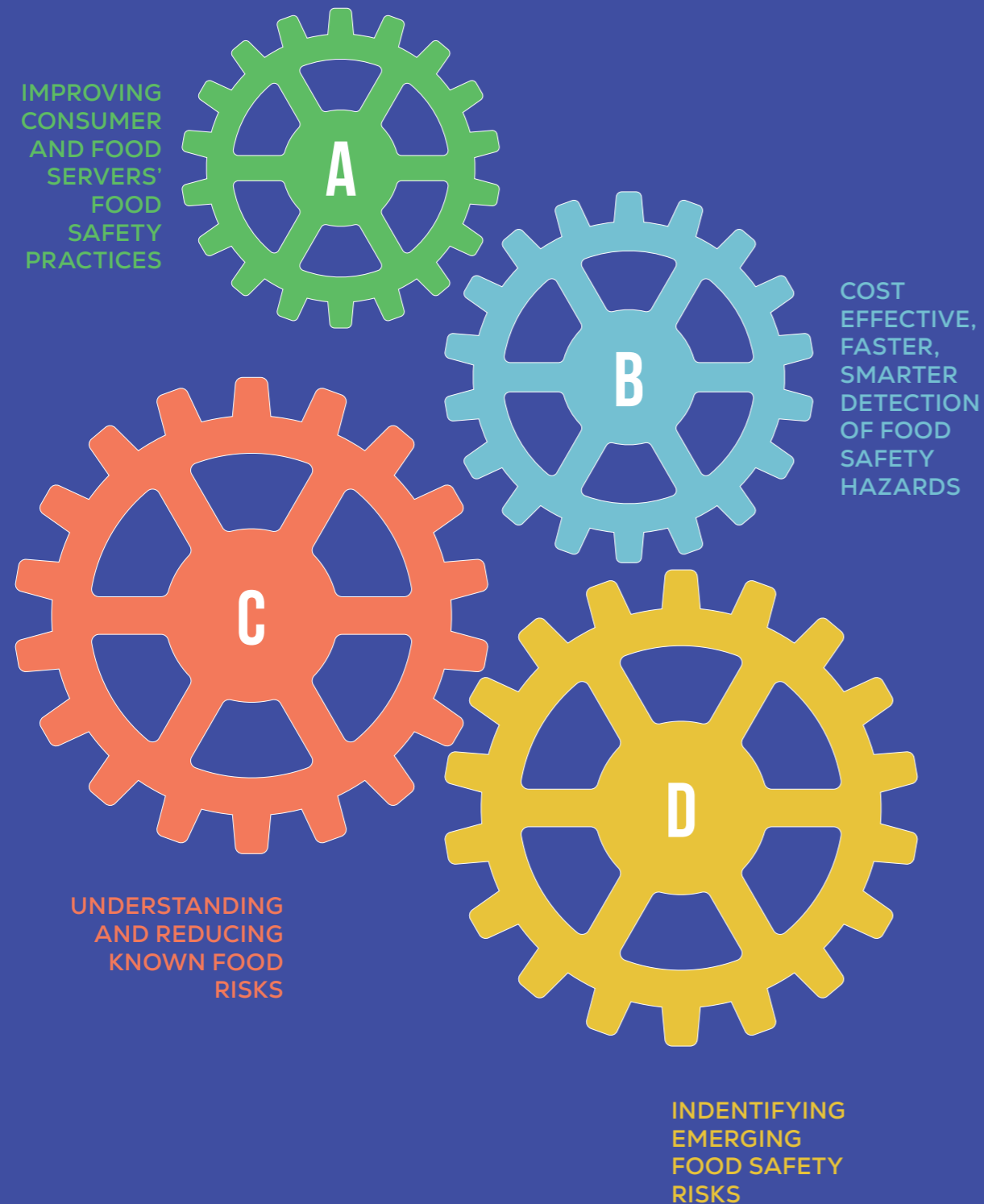
THEME D

Identifying emerging food safety risks focuses on the identification of new risks, which are emerging more frequently, in part due to social and environmental changes such as climate change, population increase, changing consumer preferences, water scarcity and the move to more sustainable practices.

Proposed investment
\$5-6 million
per annum

FIGURE TWO

Food Safety Themes Overlaid onto a Conceptual Framework



THEME A

IMPROVING CONSUMER AND FOOD SERVERS' FOOD SAFETY PRACTICES

Aim: To improve the food safety practices of those involved in the preparation of meals at home, on marae and in food service businesses.

Context: Food safety risks can arise through the whole supply chain, from the production of the food, through processing, sales, distribution, and meal preparation. Commercial food producers and processors are required to be aware of the risks that can occur and have in place risk management programmes to reduce the likelihood of a food safety issue occurring. However, it is equally important that people involved in the preparation of meals are aware of food safety risks that can commonly occur, are able to access information on how to reduce the likelihood of food safety issues occurring during food storage, meal preparation and consumption, and are able to implement safer practices when preparing meals of traditionally consumed foods, but also novel foods that may be made from alternative protein sources. This Theme also focuses on researching ways to effectively communicate potential public health risk to consumers from foods that have been found to be contaminated.

BENEFITS FROM THE RESEARCH

A higher level of knowledge of food safety issues that can occur in the home, food service and on marae.

The implementation of safer practices for food storage, preparation and consumption.

A reduction in foodborne illness.

PRIORITY RESEARCH NEEDS	TIMEFRAME	PRIORITY
To increase understanding about how foods are prepared and eaten in different settings (e.g. at home, on marae, in restaurants), and to identify key risk factors that may impact the safety of foods during meal preparation.	Medium	Medium
To evaluate actions that people involved in meal preparation can take at home, on marae, and in food service outlets to reduce food safety risk and improve suitability.	Medium	High
To identify the most appropriate approaches for communicating food safety risks and interventions to people involved in food preparation, and improve community education on food safety.	Medium - Long	High
To understand food safety risks associated with foods customarily harvested and/or traditionally consumed by Māori, including knowledge of consumption patterns, and how these risks may be reduced through combining mātauranga and traditional food safety practices with new management approaches.	Medium - Long	High

THEME B

COST EFFECTIVE, FASTER, SMARTER DETECTION OF FOOD SAFETY HAZARDS

Aims:

1. To implement new methods and technologies that allow efficient detection and characterisation of food safety hazards (biological, physical, chemical and allergens) and suitability parameters.
2. To develop data management and analytics which enable trends to be identified, provide deeper insights into the root cause of food safety problems, and support the development of preventative solutions.

Context: Robust quality assurance and risk management programmes are the key mechanism to reduce food safety risks, however there is also a need to test food products for a variety of chemical, biological and physical hazards. Typically, this is undertaken using a range of traditional methods (e.g. microbial culture methods, chemical detection methods such as LC-MS and HPLC). The current system can incur time delays associated with sample collection, dispatch, analysis and reporting back to the client. Tests that have protracted turn-around times can become obsolete and ineffective – if time delays are too long, product has already potentially been consumed by the time the result is available. The closer testing can come to being ‘real time’ or ‘continuous’, the smaller the risk window to consumers becomes.

This Theme aims to support the development of technologies and tests, for biological, chemical and physical hazards, that can be conducted through production (*in-situ*), processing (on-site) and meal preparation (i.e. on marae and in food service businesses) – with high accuracy, speed, and at an affordable level. The establishment of such technologies and methods is not trivial and requires significant developmental work to establish a robust detection approach and extensive validation to ensure fitness for purpose.

The methods currently employed, and techniques of the future, are generating a plethora of data. Data management systems need to evolve such that data collected in different parts of the supply chain can be ‘connected’ and interoperable. Analytic tools need to be developed to enable trends and associations to be examined in real time, ultimately with the aim of being able to predict ‘high risk’ times and implementing risk reduction measures that are commensurate with the level of risk.

BENEFITS FROM THE RESEARCH

High quality, accurate and reliable data on the prevalence and level of food safety hazards to support risk assessment.

The ability for all actors in the supply chain (producers, processors, retailers, food service operators, consumers, Māori) to verify the safety of foods they handle rapidly and with a high degree of certainty.

Reduction in foodborne illness and market access issues due to enhanced ability to screen products efficiently.

PRIORITY RESEARCH NEEDS	TIMEFRAME	PRIORITY
To develop and validate testing approaches that can be readily adopted by Māori to support on-site self-verification that traditional and wild-harvested foods, and foods served on marae, are safe for consumption.	Medium - Long	Medium
To develop and validate new methods and detection technologies for potential food safety hazards and quality indicators, including rapid tests, field methods, lab-based confirmatory methods, genome-based approaches, and toxicology methods (including non-animal approaches).	Medium - Long	Medium
To develop and evaluate new technologies to reduce or remove hazards from foods and the food production/processing environment (i.e. develop and validate risk reduction/mitigation approaches).	Short - Medium	High
To develop and implement new approaches for data management and analysis (including visualisation, AI, computational tools, modelling, bioinformatics) to aid predictability.	Medium - Long	Medium

THEME C

UNDERSTANDING AND REDUCING KNOWN FOOD SAFETY RISKS

Aims:

1. To characterise the risk to human health from various food safety hazards (chemical, biological, physical or allergens) and food combinations.
2. To assess the efficacy of management approaches to reduce the level of risk (e.g. use of sanitisers, adoption of technologies that inactivate microbes etc) and improve food suitability.

Context: A myriad of microbial, physical and chemical hazards can occur through all stages of the food supply chain. These hazards only pose a concern if they are present in amounts that exceed critical thresholds known to cause human illness – “the poison is in the dose”. Therefore, it is really important in New Zealand that we systematically appraise the risk to human health from hazards that are known to cause human illness – including those that cause chronic health impacts (illness related to repeated exposure over protracted periods), and those that act acutely (illness related to exposure in a finite time period e.g. one meal or one day). These appraisals need to be ongoing to account for changes that may occur regarding (1) the hazards that are causing foodborne illness in New Zealand; (2) changes in the prevalence and levels of microbial and chemical contaminants in NZ foods; and (3) changes in the pathogenicity or virulence of known microbial organisms – this is not a static situation.

In conjunction with assessments that estimate the potential impact to human health, it is critical that we also appraise the effect that certain risk reduction measures could have – in terms of human health and reducing the number of illnesses.

BENEFITS FROM THE RESEARCH

Robust information on the foodborne hazards that have the highest impact in terms of human health and the economy in New Zealand.

Identification of the most viable options to reduce risk.

Reduction in foodborne illness and economic impacts related to potential hazards in the food supply chain.

PRIORITY RESEARCH NEEDS	TIMEFRAME	PRIORITY
To evaluate the risk to Māori health from exposure to hazards that are contaminating traditional sources of food (e.g. cyanotoxin accumulation in tuna), and appraise mitigation/management options.	Long	High
To undertake risk ranking, profiling and assessment of hazards in foods to objectively evaluate their potential impact on public health.	Long	High
To appraise new or existing control/risk management steps (including packaging) to reduce risk to consumers.	Medium	High
To understand the baseline culture of food safety practices within food businesses and evaluate approaches to increase food safety and improve practices within businesses.	Short - Medium	Low - Medium
To generate basic science knowledge (fundamental research) to improve understanding of food safety hazards to feed into the risk assessment process.	Long	Medium

THEME D

IDENTIFYING EMERGING FOOD SAFETY RISKS

Aims:

1. To increase understanding of how environmental and social drivers of change are affecting the safety of foods in New Zealand.
2. To identify new or emergent threats in the food supply chain that have the potential to impact on public health and market access.

Context: Consumers, Māori, and the food and beverage sector are challenged by a significant and growing list of environmental and social pressures that may impact on food safety, public health, and market access. These drivers include climate change, the move to sustainable practices, changing consumer preferences and requirements for packaging, the increasing development and consumption of novel foods, including those made from non-traditional alternate proteins (including cellular foods), the proximity of horticultural operations to livestock operations, and population growth. Given the increase in these macro-scale environmental and social drivers, there is a need to be actively scanning for and considering new risks that have potential to impact on the safety of foods and public health.

BENEFITS FROM THE RESEARCH

The identification of potential food safety issues of public health concern before they cause significant illness in the community.

Clear identification of potential food safety threats that require further science to be undertaken, or risk management options to be considered.

Protection of public health and market access.

PRIORITY RESEARCH NEEDS	TIMEFRAME	PRIORITY
To continuously improve New Zealand's Emerging Risk Identification System to ensure it is identifying potential threats of relevance, and resulting in appropriate follow up actions that protect public health and market access.	Medium	High
To understand how the large scale environmental and social drivers of change may be impacting the safety of foods and ingredients traditionally consumed by Māori.	Short - Medium	Medium
To improve understanding of mātauranga associated with foods and ingredients considered to be non-traditional or novel, including taonga species.	Medium	Medium
To evaluate environmental and social drivers of change (particularly climate change) and identify threats to the safety of foods, beverages, and water used for production and processing.	Short - Medium	Medium
To determine if environmental and social drivers of change are impacting the toxicity, pathogenicity and antimicrobial resistance of microorganisms, and to identify if particular strains are emerging and dominating.	Medium	Medium
To develop advanced approaches to identifying and responding to (a) improve surveillance and our understanding of the epidemiology of foodborne illness, and (b) toxicological issues causing acute or chronic impacts on health.	Medium	Medium
To identify new and potential sources of risk throughout the food supply chain from production to consumption.	Medium - Long	Medium

APPENDIX ONE: STEERING GROUP



Cath McLeod
(NZFSSRC)



Tim Harwood
(NZFSSRC)



Wendy Newport-Smith
(NZFSSRC)



Vincent Arbuckle
(NZFS)



Fiona Thomson-Carter
(NZFS)



Naomi Parker
(MPI)

Note: MoH were invited to participate but were unavailable due to other commitments.

APPENDIX TWO: LEADERSHIP GROUP

Cath McLeod	NZFSSRC / Massey University
Nori Parata	Te Aitanga-a-Hauiti/Tolaga Bay Area School
Steven Ainsworth	MPI
Anne-Marie Arts	United Fresh
Georgina Dawson	ESR, Ngāi Tahu, Ngāti Kahungunu ki Heretaunga
Kaylene Larking	MIA
Phil Bremer	NZFSSRC / University of Otago
Richard Brooking	Whakaki Lake Trust
Mark Potter	NZFS
Sirma Karapeeva	MIA
Dianne Schumacher	DCANZ
Jonathan Lane	MBIE
Wendy Newport-Smith	NZFSSRC
Georgia Bell	Kai Putaiao Māori, ESR
Neil Kennington	MPI
Libby Harrison	ESR
Michael Brooks	PIANZ
Tim Harwood	NZFSSRC / Cawthron
Victor Walker	Te Aitanga-a-Hauiti
Andrew Pearson	NZFS (Tonkin + Taylor)
Cathy Webb	Seafood NZ
Colin Reid	MBIE
Naomi Parker	MPI

APPENDIX THREE:

SCIENCE LEADERS GROUP

Phil Bremer	University of Otago
Tim Harwood	Cawthron
Stephen On	Lincoln University
Sinisa Vidovic	PFR
Nigel French	Massey University / NZFSSRC
Rob Lake	ESR
Brent Young	University of Auckland
Kirsty Smith	Cawthron
Gale Brightwell	AgResearch
Kang Huang	University of Auckland
Miranda Miroso	University of Otago
Graham Flectcher	PFR
Cath McLeod	NZFSSRC
Wendy Newport-Smith	NZFSSRC
Laura Biessy	NZFSSRC

APPENDIX FOUR:

PARTICIPANTS IN STAKEHOLDER WORKSHOPS

Trevor Drage	MBIE
Gale Brightwell	AgResearch
Jeane Nicolas	MPI
Jo-Anne Short	MPI
Sue Wheeler	Woolworths / Countdown
Kirsty Smith	Cawthron
Catherine Richardson	Zespri
Hardeep Kang	Sanford
Meika Foster	Edible Research
Glenda Lewis	Communications Advisor
Phil Bremer	University of Otago
Sinisa Vidovic	PFR
Cath McLeod	NZFSSRC
Collier Isaacs	NZFSSRC
Chris Tomlinson	Tatua
Denver McGregor	NZKS
Rob Lake	ESR
Claire McDonald	MPI
Neil Smith	Silverfern Farms
Jonathan Lane	MBIE
Glen Neal	FSANZ
Carole Inkster	NZFGC
Jocelyn Eason	PFR
Philip Wescomb	Oceania
Tama Kirikiri	Massey University
Patrick Biggs	Massey University
Hila Mory	Oceania
Shaojiang Chen	Westland
Brent Young	University of Auckland
Laura Biessy	NZFSSRC
Kerry Mulqueen	PIANZ
Vivienne Hunt	NZFSSRC
Shalome Bassett	Fonterra
Ed Butler	MBIE

APPENDIX FIVE:

TIMELINE FOR DEVELOPMENT OF THE SCIENCE PLAN



APPENDIX SIX:
RESEARCH CLASSIFICATION

PRIORITIES

The Themes and Priority Research Needs identified in the Plan were developed through input from Māori, food industry representatives, scientists, and key regulatory stakeholders. These partners were asked to consider the Research Needs against the following questions:

Will research conducted in this area have a beneficial outcome for New Zealand? Examples of positive outcomes include:

- Reduction in foodborne illness.
- Increase in the confidence and trust in food.
- A health benefit for Māori and all communities in New Zealand.
- Restoration of confidence and safety in food.
- Economic benefit to the food industry, Māori or society in general.
- A significant contribution to our fundamental understanding of food safety.

Are there any significant barriers that could hinder research in this area or prevent a positive outcome? Examples of barriers include:

- Technical feasibility.
- Lack of resources to conduct work (including capacity, infrastructure, capability).
- High cost.
- Long or uncertain timeframe.
- Potential lack of Māori engagement.

The answers to these questions were analysed and used to assign priority levels (High, Medium, Low) to the research needs within the Plan.

TIMEFRAME

The estimated timeframes (duration) to conduct the research listed were defined as follows:

SHORT = LESS THAN 1 YEAR

MEDIUM = 1 TO 3 YEARS

LONG = MORE THAN 3 YEARS

The timeframes indicate how long a piece of research is expected to take (duration). Outputs from the start of the research would be expected after one year (short), three years (medium) or beyond (long). Longer-term research will extend beyond three years with long-term outcomes. The timeframes do not determine when individual research programmes should start, and they are not timeframes for investment.

COSTS

An indicative scale of investment required for each of the four Themes has been estimated. This estimate is the total amount of resource required to deliver against the aims and benefits specified in each area. It is not an indication of how much is actually available at this time.

The total investment (\$25M per year) indicated across the Plan is based on an estimate of the current national government expenditure on food safety science and research, which is around \$20M per year, and includes an uplift of \$5M per year to support the development of capability in scientists to enhance national capacity, which is currently under-resourced.

Partners involved in the development of the Plan indicated that outputs and outcomes from Theme C (Understanding and Reducing known Food Safety Risks) would make the most impact towards achieving the Plan's mission of:

Developing knowledge and tools that will ensure that food produced and consumed in New Zealand is safe for everyone

Theme C therefore receives a higher level of investment than the other Themes (see Section 8 for investment division between Themes).

The plan should be adaptive, with the ability to shift investment between Themes as research priorities change.

