



SafeFish

2021-2025

**Alison Turnbull¹, Stephen Pahl², Andreas Seger¹, Claire Hedges¹, Navreet Malhi² and
Natalie Dowsett²**

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¹University of Tasmania, ²South Australian Research & Development Institute.

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Researcher Contact Details

Name: Dr. Alison Turnbull
Address: 15-21 Nubeena Crescent, Taroona, TAS, 7053
Phone: 0418 348 450
Fax: N/A
Email: Alison.turnbull@utas.edu.au

FRDC Contact Details

Address: 25 Geils Court
Deakin ACT 2600
Phone: 02 6122 2100
Email: frdc@frdc.com.au
Web: www.frdc.com.au

In submitting this report, the researcher has agreed to FRDC publishing this material in its edited form.

Foreword

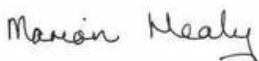
The operating environment in which seafood is marketed and consumed both domestically and internationally is changing significantly, resulting in changing food safety and market access risks. SafeFish activities have continued to evolve and adapt to address these changing risks, contributing to Australian produced seafood maintaining a fundamental criterion for market success - its reputation as a safe food product for consumers.

New risks are emerging as consumer preferences move to short shelf life ready-to-eat-products that may be purchased from traditional retail outlets or ordered online and delivered directly to households. New classes of products are also being developed, such as aquatic plants (e.g. seaweed). Detection technologies now quantify very low levels of chemical contaminants which can, and have, challenged Australia's ability to demonstrate the chemical safety of its seafood products. Changing climatic parameters, are leading to different pathogen risks in some seafood, a notable example being impact of the bacteria *Vibrio*. The SafeFish technical program has focussed on assisting with these emerging and changing risks during the 2021-25 project cycle.

SafeFish strategic program continues to support the maintenance and growth of Australia's seafood industries. The risk culture and maturity of the partner industries have been further strengthened through the facilitated identification and prioritisation of food safety and market access risks at the national level and in several industry sectors. The industry is better prepared to respond through the plans developed to mitigate the risks. SafeFish contributed technical expertise to influence development of international food regulatory standards to guard against inappropriate regulatory burdens for Australian seafood products that are exported. The future availability of expertise to the seafood industry is being developed through a SafeFish student support program to build technical capability and capacity in the safety of seafood.

A central tenet of the SafeFish operating model is the comprehensive involvement of our government, industry and researcher partners and other stakeholders in the development and implementation of the work program. SafeFish has strengthened its links with recreational fishers and organisations communicating directly with consumers, thereby expanding its reach and sphere of influence. Collaboration with public health agencies is enabling great advances in our understanding of the relationship between environmental strains of some pathogens and human illness as part of the response to changing pathogen risks.

The SafeFish partnership model results in SafeFish being very responsive to issues of importance to its partners, funders, stakeholders and associated researchers and experts. The many individuals and organisations that work with, and support SafeFish, are committed and engaged participants who give their time generously. The partnership model provides a very effective mechanism for the dissemination of information about steps to manage risks, availability of resources and training opportunities. The direct and ongoing engagement with the stakeholder groups also results in implementation of proposed solutions that deliver impactful outcomes in the short and long term.



Dr. Marion Healy PSM
Independent SafeFish Chair

Bio of Independent Chair

Dr. Marion Healy PSM

Dr. Healy holds a PhD in molecular biology and has over fifteen years of experience as a senior Executive Officer in the Australian Public Service as the Deputy CEO and Chief Scientist at Food Standards Australia New Zealand (FSANZ), First Assistant Secretary, Biosecurity Plant Division at the Department of Agriculture, Fisheries and Forestry (DAFF) and Director of NICNAS (now Australian Industrial Chemicals Introduction Scheme - AICIS).

For her outstanding public service to policy and regulatory practice, Dr. Healy was awarded a Public Service Medal in 2021. In July 2024, she was appointed as the Independent Biosecurity Commissioner of New South Wales on recommendation of the Minister.

Dr Healy is well-respected by her peers across government and industry and her biosecurity expertise ensures Ministers and government are provided with high-quality advice to build and strengthen the resilience of primary industries and the environment. She currently Chairs the Advisory Committee on Chemical Scheduling for the Therapeutics Goods Administration (January 2023 – present), is a non-executive board member of the Statutory Authority PrimeSafe (July 2021 – present) and is the Independent Chair of SafeFish (July 2021 – present).

Her experience focuses on the identification and management of risks that could threaten the health of Australia's population, fauna, flora or environment, particularly in relation to the safety of Australia's food supply and biosecurity risks to plant health. She also has experience in regulatory systems, particularly working at the science/policy interface to support regulatory decision making as well as assessing and managing risks to public health arising from chemicals and other hazards.

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We would like to acknowledge the in-kind contributions provided to the project by the University of Tasmania to fund Dr. Alison Turnbull and the South Australian Research and Development Institute (SARDI) to fund Mrs. Natalie Dowsett, Dr. Stephen Pahl and Mrs. Navreet Malhi to facilitate project management and operate the Secretariat services of SafeFish. We also acknowledge the in-kind contributions made by the SafeFish partnership members to attend meetings three times annually (operating and salaries covered exclusively by partnership member organisations); and contributions to the project out of session (including volunteering time and expertise to be involved on steering and/or selection committees). Partners include representatives from:

- Australian Shellfish Quality Assurance Advisory Committee (ASQAAC)
- Department of Agriculture, Fisheries and Forestry (DAFF) [Export Standards Branch, and the Food and Organics Branch of the Commonwealth Fisheries Research and Development Corporation](#) (FRDC)
- [Food and Beverage Importers Association](#) (FBIA)
- [Food Standards Australia New Zealand](#) (FSANZ)
- [Seafood Industry Australia](#) (SIA)
- [Seafood New Zealand](#)
- Seafood Trade Advisory Group (STAG)
- [Simplot Australia](#)
- [Sydney Fish Market](#)

In addition, we would also like to recognise the in-kind contributions and expertise provided by the following parties to the SafeFish project:

- Dr. Marion Healy (SafeFish Independent Chair (2021-2025))
- [Australian Sustainable Seaweed Alliance](#) (ASSA)
- [Food Safety Information Council](#) (FSIC)
- [Australian Recreation Fishing Foundation](#) (ARFF)

SafeFish would also like to acknowledge the direct funding to the project that is received from the following parties:

- [Australian Abalone Growers Association \(AAGA\)](#)
- [Abalone Council of Australia \(ACA\)](#)
- [Australian Council of Prawn Fishers \(ACPF\)](#)
- Australian Mussel Industry Australia (AMIA)
- [Australian Prawn Farmers Association \(APFA\)](#)
- [Oysters Australia \(OA\)](#)
- [Pearl Consortium](#)
- [Salmon Tasmania](#)
- [Southern Ocean Fisheries](#)
- [Southern Rocklobster Limited \(SRL\)](#)
- [Sydney Fish Market](#)
- [Western Rock Lobster \(WRL\)](#)
- The Commonwealth Government through the [Fisheries Research and Development Corporation \(FRDC\)](#)

Finally, we would like to thank the industry Executive Officers and FRDC Extension Officers for distributing information and outputs through their networks, and acknowledge the support provided by its stakeholders to review and input into Codex Alimentarius and other international standards setting processes that SafeFish facilitates. We would like to provide a special thanks to the FRDC for its funding and ongoing support of this important service platform. A full list of stakeholders who have contributed to the program is available in [Appendix 2](#).

Abbreviations

ABARES	Australian Bureau of Agricultural and Resource Economics
ALARA	As low as reasonably achievable
ASQAAC	Australian Shellfish Quality Assurance Advisory Committee
ASQAP	Australian Shellfish Quality Assurance Program
CAC	Codex Alimentarius Commission
CCCF	Codex Committee on Contaminants in Foods
CCFA	Codex Committee on Food Additives
CCFFP	Codex Committee on Fish and Fisheries Products
CCFH	Codex Committee on Food Hygiene
CCRVDF	Codex Committee on Residues of Veterinary Drugs in Foods
DAFF	Department of Agriculture, Fisheries and Forestry
EC	European Commission
EFSA	European Food Safety Authority
EU	European Union
EWG	Electronic Working Group
FAO	Food and Agriculture Organisation of the United Nations
FAQ	Frequently asked questions
FBIA	Food and Beverage Importers Association
FSIC	Food Safety Information Council
FRDC	Fisheries Research and Development Corporation
FSANZ	Food Standards Australia New Zealand
FSC	Food Standards Code
IPA	Industry Partnership Agreement
JECFA	The Joint FAO/WHO Expert Committee on Food Additives
ML	Maximum level
MRL	Maximum residue limit
NRS	National Residue Survey
PhD	Doctor of Philosophy
PSM	Public Service Medal
SARDI	The South Australian Research and Development Institute
SIA	Seafood Industry Australia
SPS	Sanitary and Phytosanitary Agreement Notifications
STAG	Seafood Trade Advisory Group
UTAS	The University of Tasmania
WRL	Western Rock Lobster
WHO	World Health Organisation
WTO	World Trade Organisation

Executive Summary

SafeFish is the leading national program for seafood food safety and market access in Australia. Funded by 12 different industry groups and the Commonwealth Government through the Fisheries Research and Development Corporation (FRDC), with significant in-kind from additional industry and government bodies, we take a collaborative approach to our work. We leverage the resources and key strengths of our partners, resulting in high impact research and extension activities to improve food safety, upskill our industry and supporting networks, resolve trade issues where they arise and provide evidenced-based input to developing standards and guidelines. SafeFish has been operating since 2010. This report provides an overview of the activities for the 2021-2025 financial years.

Background

Maintaining and enhancing market access for Australian seafood is critical for the industries' future stability and growth and requires a strong food safety record. Since inception, SafeFish has successfully enabled seafood industry sectors to respond in a coordinated and professional manner to food safety related trade and market access impediments. It provides industry and government departments with access to technical and scientific capability to manage known risks and assists to identify and address new risks and market access barriers that emerge.

Objectives

1. To deliver robust food safety research and advice to industry and regulators that underpins Australia's reputation as a producer of safe seafood.
2. To maintain and enhance the capabilities in Australia to provide research and advice in a cost effective, efficient, and timely manner.

Methodology

SafeFish operates under a structured approach, governed by our Charter of Operations (herein referred to as our Charter). We are guided by an advisory panel (the SafeFish partners) with an independent Chair, which supports a Secretariat. The partners come from industry, government and researchers, and along with our wide range of funders bring a variety of expertise, resources and linkages to the program. The partnership approach has been successful in leveraging the expertise and time from the member organisations to provide general oversight and strategic direction for the project. It is an active, engaged group of representatives, investing time and resources in key issues that impact seafood safety and trade through a unified platform. This group responds on several levels and through a variety of channels and is a strong asset to the seafood industry as a central point of contact for when issues arise, as well as a tool to assist in driving resolutions.

In SafeFish 2021-2025, we supplemented our governance with a Strategy and Performance Plan, detailing the activities that we undertake to meet our objectives and evaluation measures for success. To meet objective 1 (deliver robust food safety research and advice that underpins Australia's reputation as a producer of safe seafood) we: undertake fore-sighting to identify food safety issues that impact on the safety of seafood and risk to trade; support evidence-based responses to food safety/trade incidents to facilitate risk mitigation; fill research gaps on high priority issues with food safety and domestic/ international trade implications; and engage with and influence international food safety regulatory systems relating to hazards in seafood.

To meet objective 2 (maintain and enhance the capabilities in seafood food safety in Australia) we: educate and train participants in the Australian seafood industry to improve industry food safety practices; create training and development opportunities, enabling succession of key expertise; and address laboratory capability and capacity, particularly where market failures occur.

We have added a new objective: to implement governance and engagement to SafeFish to facilitate cost effective, efficient and timely operations and to maximise impacts. This objective aims to ensure SafeFish governance aligns with contemporary Australian best practice for openness, transparency and proper use and management of funds; our communication with stakeholders is effective; our networks are maintained to enable action when needed and we collaborate to increase impact.

Results/key findings

The prioritisation of food safety and market access issues continues to be keystone in the SafeFish success. The prioritisation process in 2022 identified the following priorities: the impacts from ready-to-eat (RTE) seafood due to consumer change with a focus on *Listeria monocytogenes*; chemical contaminants; *Vibrio* in seafood, micro and nano plastics in seafood – watching brief; ciguatera – progression of the health care workers survey and a continued watching brief in the space.

During 2021-2025 we have supplemented our data-driven approach with an expert-opinion process – our Risk Register. Expert opinions have the advantage of timeliness and potentially allow a wider range of stakeholders to contribute to the process. This qualitative methodology identified 32 risks (5 critical and 10 high risks) materially impacting the seafood industry. Critical risks identified were increased presence, virulence and challenges of *Vibrio species*, climate change impacts, geopolitical uncertainties for trade, industry not adapting effectively to traceability and authenticity needs, and increasing harmful algae blooms with low awareness of biotoxins and ciguatera.

An incredibly important and impactful element of the risk register work was the *Vibrio* Risk Road Map. This pathogen has caused >300 illnesses in Australian over recent years in association with oysters. In creating the *Vibrio* Risk Road Map, industry, government and researchers took a holistic approach, examining all the hurdles preventing effective risk management from farm to fork. The process not only built important networks and a community of practice but also identified clear action points for mitigating *Vibrio*-related risks, especially for bivalve producers. Additionally, the program activities informed policy discussions, influenced food safety guidance, and supported introduction of national notification of *Vibrio parahaemolyticus* illness allowing timely intervention and more readily available data. The success of this work provides a template for handling other complex issues where stakeholders are highly engaged.

The increased funds allocated to research in SafeFish 2021-2025 has allowed us to undertake fundamental research and dive deeper into food safety issues identified during the prioritisation and risk register processes, in particular *V. parahaemolyticus*. By working with public health specialists and environment researchers, we have analysed Australian whole genome sequences of this pathogen to better understand the local risks, identify pathogenic genotypes and create an important resource for future research in Australia.

Another success has been the web-based toolbox for *Listeria monocytogenes*, an opportunistic pathogen associated with a range of food, including ready-to-eat seafood, with serious consequences for immunocompromised groups such as pregnant women and the very young or elderly. Our easy-to-use toolbox identifies existing high quality training materials for all aspects of the production and supply chain, assisting industry to train staff and maintain best practice.

Concern over real and perceived food safety impacts of chemical contaminants in seafood is expected to increase as chemical use and run-off increases with our changing climate. During SafeFish 2021-2025 we have reviewed the national system for contaminant monitoring of domestic and imported products. In general, our risk management system for chemical hazards is strong. However, our analysis raised potential concerns over the surveillance approach within the National Residue Survey (NRS) of exported products, which we are working with industry and government to resolve.

It is now over 10 years since many of the international standards for Fish and Fishery Products were developed by the Codex Alimentarius Commission, and several standards and guidelines are under

review. It is important that Australia participates in these reviews to ensure alignment with our current risk management strategies to prevent trade barriers arising. During 2021-2025, we have made 16 submissions to Codex Committees, including guidelines for the control of ciguatera, infectious viruses, *L. monocytogenes* and pathogenic *Vibrio*, and supported 3 Australian technical representatives to attend Codex Committee meetings. We have reviewed 10 World Trade Organisation (WTO) notifications, alerting industry to changes in importing country standards for mercury, arsenic and isoeugenol in seafood. Our submission supported an Australian response to the European Union (EU) on inorganic arsenic as the proposed maximum levels (MLs) were not achievable in some seafood. Several other countries responded in the same manner, and the EU has now revised the proposed MLs to be more achievable.

A substantial addition made in SafeFish 2021-2025 was the sponsorship of summer students and PhD (Doctor of Philosophy) students. Through advertising three rounds of PhD scholarships, we built awareness of our high priority issues with the Australian research community, encouraged research in these areas and supported the development of the future generation of researchers. A strong future research capability is becoming increasingly important in our changing environment, through building linkages with our successful students and the seafood network we are assisting the next cohort of researchers see the future applications of their research and build their networks and communications skills.

Important capability development was also delivered through webinars on *V. parahaemolyticus* and microplastics in seafood, *Vibrio* Science Days (2022 and 2025) and Food Recall Workshops to prepare industry for incidents in the market. These popular events received high praise from attendees and will be continued in the future.

Implications for relevant stakeholders

Our strong networks with partners in the federal and state governments and within industry are instrumental for adoption of research outputs into risk management policy and practice. Strong networks also build trust and relationships between industry and their supporting government bodies, resulting in better outcomes for both sectors, particularly when incidents arise. We urge all our stakeholders to remain engaged with SafeFish so we can continue to reap the benefits into the future.

Several pieces of work conducted under SafeFish 2021-2025 addressed challenging issues and had a measurable impact. Implications for stakeholders include:

- International guidance through the Codex Alimentarius for control of pathogenic *Vibrio* and *L. monocytogenes* are under development/review respectively. Government regulator and researcher input are particularly useful at this stage.
- For industry and government alike, the review and recommendations for surveillance of chemical contaminants in seafood will need careful consideration and follow-up actions. Decisions made in relation to this work will shape the future of chemical monitoring of seafood in Australia.
- The results of our *Vibrio* work are particularly useful for the improved risk management of risk in oysters, but also relevant for all other seafoods, which have been implicated in outbreaks of illness internationally. The Australian Shellfish Quality Assurance Advisory Committee and the seafood industry in general should maintain a watching brief on this topic.
- The gazetting of *V. parahaemolyticus* as a nationally notifiable disease is expected to result in higher reporting of illnesses from this pathogen. Government and industry should be prepared with policies and plans on how to respond. As many State Government policies are relatively new, flexibility is likely to be needed to adapt them based on learnings from each event.
- The gazetting of new national Food Standards Code Maximum Levels (MLs) for marine biotoxins in bivalve molluscs reflects international risk assessments for these highly potent toxins, reducing the allowable level. Commercial laboratories have adapted their analytical output to report in the standardised units. Government regulators need to be aware of the changes.

- The risk register has raised concerns over a number of current and emerging issues affecting food safety and market access. Industry stakeholders should make themselves aware of these risks and businesses should examine their own exposure, reviewing their practices in these areas, revising where necessary, and directing appropriate resources to further actions if warranted.
- Seafood businesses, particularly postharvest, should be aware of *L. monocytogenes* risk in their business and if necessary, train their staff in control using the resources provided in the SafeFish web-based toolbox.
- Industry should ensure their food recall policies and procedures are consistent with best practices using the information and tools from the workshops organised by SafeFish. Stakeholders should also consider the information on emerging issues provided at webinars in and determine impact within their sphere of responsibilities.

Recommendations

We recommend the data-driven prioritisation process remains the mainstay for identification of priority issues for the SafeFish research and capability development agenda. This process should be supplemented by an expert-opinion process once every 5 years, potentially added to our stakeholder communications survey.

Incident response has been a major activity during the 2021-2025 project. Flexibility needs to be built into the program to ensure this activity is adequately funded. Consideration needs to be given to delaying/curtailing other activities when major incidents arise.

Codex Alimentarius and Sanitary and Phytosanitary (SPS) Agreement activities should remain a core part of the program given the success of this work and the efficiency of the processes employed. Where appropriate (i.e. for issues of particular importance to Australian seafood), research should align with upcoming topics at Codex, particularly if knowledge gaps exist.

The Vibrio Risk Road Map has been highly successful and should be maintained, with annual updates on progress and meetings as appropriate. If other emerging issues are identified that includes risk management gaps at multiple stages in the supply chain, a similar actionable road map process should be undertaken.

The programmatic approach we have taken towards research has enabled us to delve deeper into each issue and address significant gaps in knowledge, tools or training. As a result of undertaking fewer research projects and continuing research across years, our outputs are more substantial and have more impact. We recommend this model continues. We also recommend fundamental research continues on *V. parahaemolyticus*, building on the whole genome sequence database and networks we have created. Similarly, research and extension activities should continue into chemical residues, ciguatera in seafood, and work in the ready-to-eat supply chain to reduce risks for consumers.

Effort should be invested in communicating food safety risks to recreational fishers that aligns with their preferred methods of information uptake. The recreational fishing representative on our partnership has made a strong case for this work due to the large number of recreational fishers and the scarcity of food safety information available in the right format for them.

The PhD and studentship program should continue, although investment in advertising and selecting students was high. We recommend reducing the number of operating grants but including a full time PhD stipend for study of one area in depth.

Webinars have reached a broader audience with positive feedback and become a key communication tool. It is recommended that this communication tool be expanded.

The governance of SafeFish should continue to be reviewed on a regular basis to provide a strong foundation for the program. Similarly, the Strategy and Performance Plan should be reviewed early in

the next SafeFish project in a face-to-face meeting of the Secretariat. We recommend that the current Independent Chair is retained for a period to ensure continued operation of the program. A new Chair should be sought in year 3 or 4 of the next SafeFish program. [Appendix 1](#). Succession planning for the program should be undertaken to ensure continued strong leadership and delivery in future years.

Keywords

Seafood Market Access, Food Safety, Trade, Standards, Codex, SPS, SafeFish, chemical contaminants, Vibrio, biotoxin, *Listeria*, hazards, microplastics, ciguatera, Abalone Council of Australia Ltd., Australian Abalone Growers Association, Australian Council of Prawn Fisheries, Australian Mussel Industry Association, Australian Prawn Farmers Association, Oysters Australia, Salmon Tasmania, Southern Ocean Fisheries, Pearl Consortium, Southern Ocean, Southern Rocklobster Limited, Western Rock Lobster Council Inc., Sydney Fish Markets.

Introduction

SafeFish is the leading national program for seafood food safety and market access in Australia. Funded by 12 different industry groups and the Commonwealth Government through the Fisheries Research Development Corporation (FRDC), with significant in-kind from additional industry and government bodies, we take a collaborative approach to our work. We leverage the resources and key strengths of our partners, resulting in high impact research and extension activities to improve food safety, upskill our industry and supporting networks, contribute evidence to facilitate resolution of trade issues and provide evidenced-based input to developing standards and guidelines.

SafeFish has been operating since 2010. This report provides an overview of the activities for the 2021-2025 financial years. To date, three sequential projects have been completed: SafeFish 2015-2018 (FRDC 2015-212) funded solely through FRDC; SafeFish 2018-2021 (FRDC 2018-004) and SafeFish 2021-2025 (FRDC 2021-018) both of which were financed through matched Industry Partnership Agreement (IPA) funding and FRDC public good funding. Contributions of funding from a broad range of industry sectors acknowledges the impact any seafood food safety incident will have on the whole seafood market and enables capability to be developed in Australia to support the seafood industry in their market access and food safety activities.

The Australian seafood industry is highly valuable both for the domestic food supply and as an export industry. The most recent Fisheries and Aquaculture statistics 2022 demonstrate that our seafood industry is thriving, with the total value of production reaching \$3.42 billion,¹ marking an 8% increase over the last period. Aquaculture has seen a significant boost, with its Gross Value of Production (GVP) rising by 13% to \$1.94 billion, while the wild catch GVP grew by 2% to \$1.51 billion. Australians consumed 350 kilotons of seafood, making it the fourth most consumed protein after poultry, pork, and beef. We also exported high value products such as salmonids, rock lobster, abalone and tunas worth \$1.28 billion, to major markets including China, Hong Kong, Japan, the United States of America (USA), and Vietnam. Imports of seafood into Australia were valued at \$2.19 billion, primarily from Vietnam, Thailand, China, New Zealand, and Indonesia.

Maintaining and enhancing market access for Australian seafood is critical for future industry stability and growth and requires a strong food safety record. In recent times the Australian seafood industry has faced major disruptions that have implications for our ability to produce safe seafood and access our key markets. These include climate change, affecting marine ecosystems and seafood species as well as the associated food safety hazards; supply chains disruptions e.g. as a result of the COVID-19 pandemic; regulatory changes introducing stricter compliance that has increased operational costs and added complexity for seafood businesses; and geopolitical unrest disrupting market access through bans and trade restrictions to specific lucrative markets. These factors not only impact the industry's economic stability but can also impact public health through foodborne illnesses.

An example on the significance of market access is the recent ban on live export trade of rock lobsters into China based on a chemical contaminant issue. The Chinese market for live rock lobster has historically been one of high demand and the most lucrative option for Australian exporters. Live trade stopped in November 2020 and only resumed in December 2024 for Western, Eastern and Southern Rock Lobster. Tropical Rock Lobster remains unable to access this market as China have listed this as an endangered species, which Australia is contesting. In 2019, China imported AUD \$730M worth of live lobsters (8,923 tonnes), making up over 95% of Australia's lobster exports². The rock lobster industry in

¹ ABARES statistics: Tuynman, H, Cao A, Dylewski, M and Curtotti, R (2023) Australian fisheries and aquaculture statistics 2022, Fisheries Research and Development Corporation, ABARES, Canberra, December, DOI: https://daff.ent.sirsidynix.net.au/client/en_AU/search/asset/1035343/0

² Western Rock Lobster (2024) Global Trade Report: An overview of global lobster production and international trade: 2024 edition. October 2024. <https://westernrocklobster.org/wp-content/uploads/2024/10/2024-Global-Trade-Report.pdf>

Australia faced a significant challenge and were forced to explore new markets both domestically and internationally which resulted in significant financial losses. Western Rock Lobster alone lost \$850M over four years (Matt Taylor, pers. comm). The longer-term outlook for the sector remains positive but this incident highlights the ongoing reliance on this lucrative market despite efforts to diversify their trade to other destinations, and the potential use of food safety as a cause for trade disruptions.

Another key economic burden and focus for the Australian seafood industry is prevention of foodborne illness and ensuring a healthy food supply. The SafeFish program plays a crucial role by identifying potential food safety hazards and providing advice and support on meeting national and international safety standards. The recent Australian National University report³ prepared for Food Standards Australia, New Zealand (FSANZ), reveals that the direct annual cost of foodborne illness in Australia is \$2.81B AUD across all food commodities (see Figure 1). Foodborne disease in Australia causes an estimated combined annual burden of 357,000 cases of illness resulting in approximately 13,500 hospitalisations and 40 deaths across all food commodities in 2019 and is generally attributed to six common pathogens, only three of which are found in seafood: *Salmonella*, *Norovirus* and *Listeria*, causing an annual disease burden of \$161M, \$47M, and approximately \$90M respectively across all foods. The total illness attributed to seafood contamination is relatively low compared to other commodities, these figures highlight the significant economic impact from foodborne illness, and the imperative for the seafood industry to put measures in place to prevent and/or minimise its occurrence.

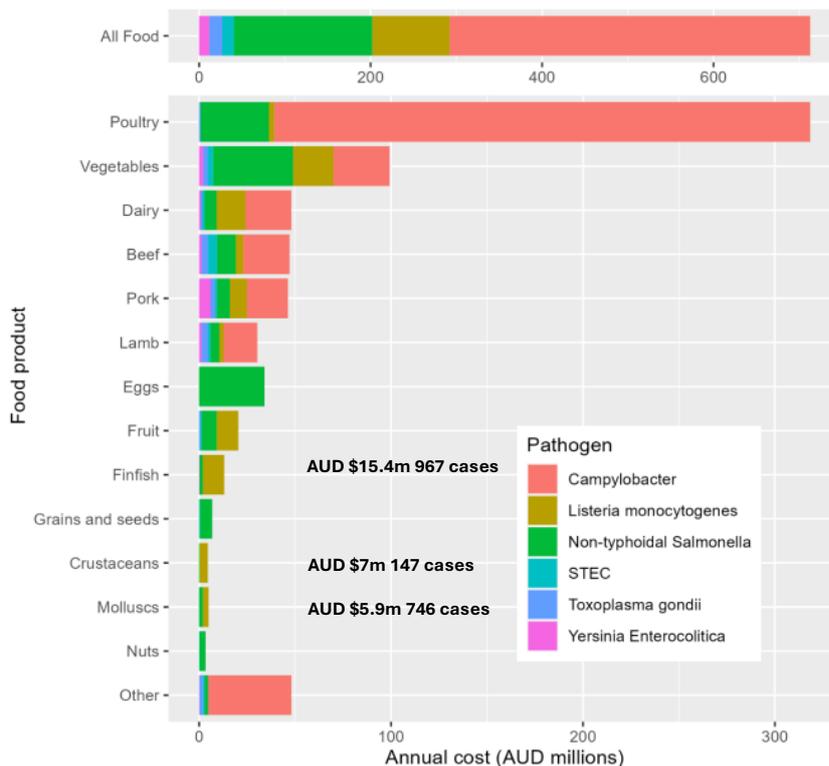


Figure 1. Estimated costs arising from foodborne disease due to six pathogens, attributed to thirteen food commodities and “other”. For clarity, the total cost for all food has been plotted on a separate horizontal scale. Costs were estimated for 2019 and have been inflation adjusted to June 2023. Adapted from Australian National University (2023).

³ Australian National University (2023) The annual cost of foodborne illness in Australia by food commodities and pathogens. Final report for Food Standards Australia, New Zealand. August 2023. <https://www.foodstandards.gov.au/sites/default/files/2024-09/ANU%20Foodborne%20Disease%20Attribution%20Final%20Report.pdf>

The *V. parahaemolyticus* outbreaks linked to Pacific Oysters from South Australia (SA) in 2021 and 2022 are examples of foodborne illness events that caused significant financial burden on industry. Two outbreaks occurred, the first in March 2021 resulting in 21 reported illnesses and the second between September 2021 and February 2022, affecting at least 268 people. SafeFish coordinated an economic assessment⁴ of the second event where 746,238 dozen oysters were recalled and destroyed, resulting in a revenue loss of \$7.4M. The total estimated impact on the oyster industry and its supply chain, including lost gross operating surplus, unexpected capital expenditures, postharvest packaging, processing, transport and losses to the food retail and service sectors was \$14.7M on cash balance. The costs incurred by the SA Government (representing costs from the Department of Primary Industries and Regions (PIRSA), SA Health and local government) were \$311k (excluding certain expenses incurred by SA Health). The report underscores the severity of such outbreaks and highlights the importance of proactive management efforts to reduce the likelihood and severity of future incidents. It also emphasizes the importance of resilience and adaptability within the industry to handle similar disruptions in the future.

The above examples highlight the importance of the seafood industry understanding and managing their food safety and trade risks appropriately. SafeFish is the key FRDC service platform to assist the Australian seafood industry to do this by supporting market access negotiations and resolution of barriers to trade, identifying and prioritising food safety and trade issues of relevance to seafood and assist with ensuring that regulatory standards and consumer confidence in the quality and safety of Australian seafood can be met.

Objectives

1. To deliver robust food safety research and advice to industry and regulators that underpins Australia's reputation as a producer of safe seafood.
2. To maintain and enhance the capabilities in Australia to provide that research and advice in a cost effective, efficient and timely manner.

For our Strategy and Performance Plan we separated these objectives further to enable better reporting and evaluation:

1. To deliver robust food safety research and advice to industry and regulators that underpins Australia's reputation as a producer of safe seafood.
2. To maintain and enhance the capabilities in seafood food safety in Australia.
3. Implement governance and engagement of SafeFish to facilitates cost effective, efficient, and timely operations and maximise impacts

⁴ Rust, S, Turnbull, A, Magnusson, A, Carlin, L. (2025) *Economic analysis – Pacific Oyster 2021 Vibrio Parahaemolyticus outbreak*. IMAS Technical Report prepared by Binder Dijker Otte (BDO) Consultants.

Method and Results

In 2023 a Strategy and Performance Plan was developed to detail the objectives of the SafeFish project, and was used to monitor, evaluate and report on key activities and outcomes that were required to be delivered to ensure that the needs of our stakeholders and funders were being met.

The plan was developed to address the following strategic objectives that were set for the SafeFish project:

Objective 1: To deliver robust food safety research and advice to industry and regulators that underpins Australia’s reputation as a producer of safe seafood.

Objective 2: To maintain and enhance the capabilities in seafood food safety in Australia

Objective 3: To implement governance and engagement to SafeFish to facilitate cost effective, efficient and timely operations and to maximise impacts.

The tables below are used to describe the activities undertaken by SafeFish during 2021-2025 to meet each objective, and the performance measures, achievements and impact for each activity.

Objective 1: To deliver robust food safety research and advice to industry and regulators that underpins Australia’s reputation as a producer of safe seafood.

Strategy	Activity	Performance Measure	Achievements	Impact
Fore-sighting to identify food safety issues that impact on the safety of seafood and risk to trade. <i>Continues on pages below</i>	Undertake a data driven situational scan to identify information gaps/risks affecting the Australian seafood industry. Engage with stakeholders to prioritise SafeFish research development and extension activities that provide the most benefit back to the seafood industry.	Identification and agreement by the SafeFish partners and funders for priority issues and associated research.	Prioritisation workshop and process held in July 2022 (Appendix 3). Identified issues ranked by stakeholders for public health, economic, trade and market access, reputational, sustainability and regulatory risk.	Directs research to high priority issues for the seafood sector, with either current or emerging ramifications. Raises awareness of SafeFish stakeholders about high-priority issues and providing an opportunity for stakeholders to influence the SafeFish work program.

Strategy	Activity	Performance Measure	Achievements	Impact
<p>Fore-sighting to identify food safety issues that impact on the safety of seafood and risk to trade.</p> <p><i>Continues below</i></p>	<p>Undertake expert consultation with the seafood industry and broader stakeholders as a whole, and specific seafood sectors individually, to build a strategic, collaborative and targeted approach to preparedness for food safety risk.</p>	<p>Risk register for Australian seafood nationally followed by the development of tailored sector plans</p>	<p>National risk register completed in Jun 2022. 32 risks identified and categorised into critical, high, medium and low priority. The five most critical risks were Vibrio, climate change impacts, geopolitical uncertainties for trade, traceability and authenticity, and increasing harmful algae blooms resulting in biotoxins and ciguatera. Review and validation of results was completed in Jan 2025, resulting in minor changes. See 'Project materials developed' for report, including 2025 review.</p>	<p>Identifying major risks through expert elicitation and the data-driven prioritization process gave similar outcomes, providing confidence that the critical risks had been identified. Highlighting critical risks led to action on Vibrio, prompted discussions on the expected impacts of climate change, and identified new emerging research focuses.</p>
	<p>Undertake expert consultation with the seafood industry and broader stakeholders as a whole, and specific seafood sectors individually, to build a strategic, collaborative and targeted approach to preparedness for food safety risk.</p>	<p>Specific sector risk registers.</p> <p>Blueprint provided for other sector specific action plans to be developed if required</p>	<p>Bivalve sector process completed Dec 2023. Prawn sector process completed Aug 2024. Major risks in food safety and market access identified for both sectors and produced as major reports, then summarised in short communication documents.</p> <p>Risk Register playbook developed Apr 2025 to assist with repeating process in future.</p>	<p>Creating risk registers with the oyster and prawn sectors has helped them to proactively manage current and emerging risks, building long-term resilience through informing funding decisions, strategic plans, risk management activities at the business and sector level and improving preparedness.</p> <p>Identifying areas where the wild-caught and aquaculture prawn sectors have similar concerns enables collaboration between sectors. Upskilling industry in methodology to create their own risk registers increases understanding of future possibilities and therefore increases resilience.</p>

Strategy	Activity	Performance Measure	Achievements	Impact
	Undertake expert consultation with the seafood industry and broader stakeholders to build a strategic, collaborative and targeted approach to preparedness for food safety risk.	National Vibrio Risk Road Map	The National Vibrio Risk Road Map (confidential document included as an attachment) was created in Aug 2023. Progress since: industry and state risk-reduction policies and guidelines implemented in SA, Tas and NSW, and within ASQAAC's ASQAP Operations Manual; <i>V. parahaemolyticus</i> gazetted as a nationally notifiable disease on 1/1/2025; research begun into fundamental knowledge gaps identified; several State agencies undertaken surveys at the growing area level; and SafeFish resources developed to assist understanding and management of Vibrio (Project materials developed).	Coordinating a community of practice across industry, government and researchers has reduced overall Vibrio risk by improving management of this major threat. <ul style="list-style-type: none"> Strengthened regulatory requirements and guidance documents reduce Vibrio levels at harvest and in the supply chain, reducing risk of illness from commercially harvested oysters national notification of <i>V. parahaemolyticus</i> illness improves response to illnesses, reducing the scale of outbreaks Researching fundamental knowledge gaps enables on-going improvements (see research projects below).
Fore-sighting to identify food safety issues that impact on the safety of seafood and risk to trade.	Building broader awareness on identified key issues to encourage other relevant organisations to work in this space.	<ul style="list-style-type: none"> Articles published in industry relevant magazines across the grant cycle. Number of stakeholders informed of key issues communicated within a month of the relevant Partners meeting. 	<ul style="list-style-type: none"> 7 news articles for industry publications. 1 Conference proceeding on raising awareness for ciguatera poisoning in Australia. 2 radio interviews conducted raising awareness on climate change impacts to shellfish, and ciguatera poisoning. Currently 12 partner organisations and 13 funder organisations receiving SafeFish outputs. 13 partner meetings conducted with minutes, communiques, updates and agenda produced for all. 255 industry meetings attended, 10 workshops facilitated, and 26 presentations delivered between 2021-2025. A complete list of activities completed can be found in 'extension and adoption' below. 	Building awareness of issues assists us to attract research and collaboration partners to help provide solutions e.g.: increased PhD students addressing Vibrio and chemical contaminants; collaborations with NZ colleagues (Vibrio) and public health professionals (national Vibrio research collaboration); collaborating to raise awareness of ciguatera poisoning to improve reporting of cases and outbreaks.

Strategy	Activity	Performance Measure	Achievements	Impact
Supporting evidence-based responses to food safety/trade incidents to facilitate risk mitigation.	Provide technical advice to facilitate risk mitigation including: <ul style="list-style-type: none"> • Reviews of domestic and international technical information • Risk communication support from a technical perspective 	Feedback from stakeholders and production and updating FAQs or food safety fact sheets	<ul style="list-style-type: none"> • Food Safety fact sheets & FAQs were ranked the 4th most valued service offered out of 11 in the Stakeholder Communications Survey • 12 technical reviews completed on standards, documents and submissions. • 24 hazard-based fact sheets were reviewed and updated • Participated in FSANZ expert elicitation process to attribute illness to food sectors • 3 new hazard-based fact sheets developed (2x Vibrio and 1x Cadmium) 	<p>Educating stakeholders on common food safety hazards informs them on risk and supports evidence-based development of mitigation measures such as best-practice guides, policies, and standards.</p> <p>Providing technical advice meets stakeholder requirements for communication on topical hazards.</p>
Supporting evidence-based responses to food safety/trade incidents to facilitate risk mitigation.	Respond to technical queries on all aspects of food safety & market access.	Number of enquiries answered per year.	<p>133 enquiries responded to between 2021-2025. Enquiries relating to the following were received:</p> <ul style="list-style-type: none"> • Testing requirements, availability and interpretation of outputs. • Market access requirements. • Legislation and guidelines. • Identification of consultants/experts. 	Reducing hurdles for trade and potential food safety issues helps stakeholders to control risks appropriately, meet their customer expectations, and respond to incidents as effectively as possible.

<p>Supporting evidence-based responses to food safety/trade incidents to facilitate risk mitigation.</p>	<p>Respond to food safety and market access incidents to support appropriate risk management and future research development.</p>	<p>Provision of technical information to support emergency incident response management.</p>	<ul style="list-style-type: none"> Supported the development of research in response to cadmium detections in lobster in China 2020, and immediate closure of \$730M export market. Continued to support negotiations for re-entry to the market (obtained Dec 2024) whilst research was on-going. Supported industry/DAFF by developing an FAQ on use of Isoeugenol based anaesthetics in response to a recall of Australian Eel products from South Korea after they adopted an MRL of 0.01mg/kg in fish in July 2018. Supported industry and government during the SA Vibrio outbreak (21 illnesses in March 2021 and 268 in Sept 2021-Feb 2022), assisting industry to adopt a best practice harvest guideline, and government to develop risk management procedures. Compiled NSSP guidance in a Vibrio review by DJ McCoubrey during SA outbreak, sent to all ASQAAC members. Reviewed cost of outbreak (\$14.7M). Supported NSW vibrio outbreak through provision of information during the event and provided presentation to NSW industry. Raised awareness of trade and food safety risks during SA harmful algal bloom (HAB). Supported government and industry with information to support risk communication, risk monitoring and analysis. Investigating use of rapid tools for brevetoxin analysis in seafood (on-going). Developed brevetoxin fact sheet. Participated in SA Scientific Advisory Panel. In collaboration with Australian and New Zealand Experts, formed Australia New Zealand Harmful Algal Bloom Network (Aus-NZ HABnet) to build capability and capacity in Australia. Contributed to FRDC and Aus-NZ HABnet responses to the 	<p>Provision of independent and timely advice on hazards has significant benefit by enabling swift and appropriate responses, thus reducing the impact of events both economically and in terms of illness.</p> <p>For example:</p> <ul style="list-style-type: none"> the immediate response to the cadmium in lobster incident enabled rapid development of research that saw an expansive survey conducted within 5 months of the incident, providing the evidence to DAFF to support negotiations for re-entry. The value of the lobster industry decreased by 50% during this event (~\$365M per annum). The fact sheet on Isoeugenol alerted other industries that were using isoeugenol off-label to the risks and requirements for use in domestic and export product, preventing further incidents. the report on the cost of the SA vibrio outbreak has provided evidence for a balanced discussion on the cost of risk mitigation (e.g. expensive on-site refrigeration) versus the cost of the incident.
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Strategy	Activity	Performance Measure	Achievements	Impact
			<p>Commonwealth Government enquiry into the SA HAB.</p> <ul style="list-style-type: none"> Supported industry and government responses to the use of Florfenicol antibiotic in salmon pens in Tasmania, with flow on effects for wild fisheries in surrounding waters. Identified MRLs and methods of analysis in countries where Tasmanian seafoods commonly exported, produced fact sheet (currently under review). 	
Fulfil research gaps on high priority issues with food safety and domestic/international trade implications	Analyse available risk mitigation resources for <i>Listeria</i> in 'Ready-To-Eat' (RTE) seafood and develop an online tool kit. Identify if additional training material is required.	<ul style="list-style-type: none"> Report on resources available to manage <i>Listeria</i> in seafood. On-line navigational tool/resource for the SafeFish website. Survey to identify future training needs. 	<ul style="list-style-type: none"> Listeria report completed Feb 2024 Development of <i>L. monocytogenes</i> and ready-to-eat seafood webpage. Survey of industry, distributors, key stakeholders completed 2025. 	Raising awareness and upskilling industry, regulators and consumers enables appropriate risk management of this challenging pathogen, becoming increasingly important as demand for ready-to-eat foods increase. Making resources easily accessible helps identify the correct information amongst the plethora of guidance documents available.
Fulfil research gaps on high priority issues with food safety and domestic/international trade implications	Research project on chemicals in seafood with human health implications to provide a strong knowledge base and inform ongoing surveillance.	Gap analysis report by July 2023. Project work completed by June 2025.	<p>Gap analysis report and stakeholder workshop completed Sept 2023 (Confidential report included as an attachment).</p> <p>Further investigation and collaboration with key stakeholders led to focussing on an NRS review considering the monitoring needs of industry, government legislated requirements, costs and funding arrangements, and the conduct of comparable systems overseas.</p>	<p>Identifying a pathway for difficult but necessary discussions on Australia's approach to demonstrating adequate management of chemicals in exported seafood to trading partners assists to improve systems and build better relations between industry and government. Questions have been raised about:</p> <ul style="list-style-type: none"> The representativeness of the NRS program. The breadth of the program under static funding, yet growing trade. <p>This project underpins discussions and decisions to determine the future direction for monitoring heavy metal and pesticide residue levels in domestically consumed and exported seafood.</p>

Strategy	Activity	Performance Measure	Achievements	Impact
Fulfil research gaps on high priority issues with food safety and domestic/ international trade implications	Support national research into Vibrios in seafood that addresses key knowledge gaps.	<ul style="list-style-type: none"> • Collaborative workshop of researchers. • Research proposals to advance knowledge and build capability. 	<ul style="list-style-type: none"> • National Whole Genome Sequencing (WGS) Research into <i>V. parahaemolyticus</i> undertaken with collaborators across Australia, uniting health professionals, research scientists, government regulators and industry. Project ongoing, with publications expected in 2026. 682 WGS obtained for clinical and environmental (food) samples will be made publicly available and examined to provide information on pathogenic strains present in Australian waters. • SA outbreak costing undertaken in 2024/25 detailing costs to industry and government of the September 2022 outbreaks. 	<p>Establishing fundamental knowledge of the environmental <i>V. parahaemolyticus</i> variants that cause illness helps us develop protocols to recognise and manage pathogenic Vibrio, reducing regulatory burden by enabling targeted measures to protect human health.</p> <p>Breaking barriers to collaboration between public health and environmental researchers has generated a publicly available database and built networks, both important elements for future breakthroughs.</p> <p>Building capacity of the Australian scientific community in bioinformatics supports fundamental activities across a range of microbial pathogens.</p>

Strategy	Activity	Performance Measure	Achievements	Impact
<p>Fulfil research gaps on high priority issues with food safety and domestic/international trade implications</p> <p><i>Continues below</i></p>	<p>Additional research projects</p>	<p>Improved awareness and reporting of ciguatera</p>	<ul style="list-style-type: none"> • Survey to raise awareness designed, ready to be rolled out to the health worker distribution network when appropriate (postponed due to high workloads of public health officials associated with COVID pandemic). • Closer collaboration developed with state health departments (e.g. supporting North Queensland’s Manager Environmental Health to attend the 17th Session of Codex Committee on Contaminants in Foods (Panama City, Panama). • Reviewed new national ciguatera poisoning questionnaire prior to roll out by QLD Health & OzFoodNet. • Maintained watching brief of national and international developments & maintenance of the Australian ciguatera mailing list to share latest advances/facilitate collaboration • Worked with Ecofisheries to proactively develop a research proposal identifying ciguatera risks in offshore Coral Sea fisheries to prevent the export of ciguateric fish from Australian waters. 	<p>Improving reporting capability of historically underreported cases of ciguatera poisoning allows better estimation of true incidence and trace back of cases to ciguatoxic fish, identifying high risk species and locations.</p> <p>Improving awareness and collaboration among multidisciplinary stakeholders, including researchers & health departments enables all players to keep on top of advancements and changing risks, important given the association with our changing climate.</p> <p>Highlighting risks and providing a research blueprint for mitigation studies provides a path forward (if funding can be attained).</p>
	<p>Additional research projects</p>	<p>Biotoxin harmonisation</p>	<p>Harmonisation of the standards for paralytic and diarrhetic shellfish toxins in the Australia New Zealand Food Standards Code with international standards. Worked with other FRDC foundational services (particularly Human Dimensions, FishNames and Seafood Industry Australia) to develop an Expression of Interest proposal; “Understanding and minimising species and provenance mislabelling of seafood in Australian supply chains” ahead of new Country of Origin Labelling requirements.</p>	<p>Improves consumer safety through following international risk assessments, as well as provides consistent standards for domestic and export production, with the ability to meet all market requirements.</p> <p>Highlighting seafood mislabelling in the market, identifying why it is occurring, and what potential interventions might be successful in reducing opportunities and increasing disincentives, will help to reduce future mislabelling occurrences (if funding can be attained).</p>

Strategy	Activity	Performance Measure	Achievements	Impact
Fulfil research gaps on high priority issues with food safety and domestic/ international trade implications	Peer review of research outputs.	All major research outputs undergo appropriate review.	<ul style="list-style-type: none"> Informal external review of the 'Economic Analysis - Pacific Oyster 2021 V. <i>parahaemolyticus</i> outbreak' was undertaken. 	The review supported the robustness of research methodology and findings and confirms accuracy of the report, providing confidence in SafeFish being a trusted and reputable advisor to industry and government.
Engaging and influencing international food safety regulatory systems relating to hazards in seafood.	Ascertain impact and support an Australian response where relevant to SPS Agreement notifications.	No current metric for performance assessment.	<ul style="list-style-type: none"> 1 formal response to SPS⁵ notifications; 10 notifications of changes to Stakeholders (see Appendix 4) 	Raising awareness and responding to potential changes to regulations of trading partners helps industry to manage any trade risk and facilitates sound and justified SPS measures.
Engaging and influencing international food safety regulatory systems relating to hazards in seafood.	Maintain awareness and advise stakeholders of relevant Food & Agricultural Organisation (FAO) and World Health Organisation (WHO) activities.	No current metric for performance assessment.	<ul style="list-style-type: none"> 5 notifications of activities being conducted related to food safety (see Appendix 4) 	Reviewing and promulgating information on FAO and WHO activities provides early warnings about emerging food safety issues and the latest science that supports strengthened food safety and quality control systems, guides research and development, influences health policies, and ensures proactive decision-making in food safety and public health.

⁵ SPS measures are designed to protect humans, animals or plant life or health from risks arising from additives, contaminants, toxins or disease-causing organisms in food and feed or the introduction/spread of pests or diseases. SPS notifications are governed by a WTO Agreement and provide early warnings about future measures that may result in restrictions of trade.

Strategy	Activity	Performance Measure	Achievements	Impact
Engaging and influencing international food safety regulatory systems relating to hazards in seafood.	Engaging and influencing international food safety regulatory systems relating to hazards in seafood at Codex Alimentarius.	<ul style="list-style-type: none"> • 6 technical briefs submitted per grant cycle. • Attendance at 1 relevant meeting or electronic working group per year. 	<ul style="list-style-type: none"> • 15 calls for industry comments or notification of Codex actions • 16 formal responses to Codex Australia • 8 responses to working groups • 3 technical representations at Codex meetings (see Appendix 4) 	Contributing to Codex through technical representation at meetings and submissions to standard and guideline development ensures consideration of Australian conditions, supports decisions that are risk commensurate and builds the quality and fairness of international food trade based on sound scientific principles.

Objective 2: To maintain and enhance the capabilities in seafood food safety in Australia

Strategy	Activity	Performance Measure	Achievements	Impact
Educate and train participants in the Australian seafood industry to improve industry food safety practices.	Conduct workshops on a mock food recall scenario to build incident preparedness.	Workshop conducted and materials available by Dec 2023.	Two in person and two on-line workshops were conducted between June and November 2024 (refer to Project materials developed), capped at 15 people each to allow in-depth training for each attendee. 45 participants attended and were trained by experts from FSANZ and Integrity Compliance Solutions.	Upskilling practitioners enables faster action during incidents, significantly reducing the impact on economic and reputational losses.
Educate and train participants in the Australian seafood industry to improve industry food safety practices.	Maintain current and create new fact sheets on priority food safety hazards to inform incident management and general awareness.	Review the currency of existing fact sheets every year and update as necessary. Produce new fact sheets as issues arise.	27 hazard based fact sheets or Frequently Asked Questions (FAQs) are available on the SafeFish website . Review and amendments conducted May 2023.	Educating stakeholders on common food safety hazards informs behaviour to reduce risks and supports evidence-based development of mitigation measures such as best-practice guides, policies, standards and regulation.

Strategy	Activity	Performance Measure	Achievements	Impact
Educate and train participants in the Australian seafood industry to improve industry food safety practices.	Build knowledge and awareness of the current best practice and research on key topics through science workshops and webinars.	Two webinars or one workshop per annum.	<ul style="list-style-type: none"> • Vibrio science day workshop – Jun 2022 • Microplastics webinar – Jun 2024 • Vibrio science day – May 2025 	Upskilling attendees dispels conjecture by presenting the facts on seafood food safety issues of concern, particularly those receiving current media attention. The events enhance collaboration opportunities between subject matter experts.
Creating training and development opportunities, enabling succession of key expertise.	Support new researchers by offering a PhD grant for students studying relevant seafood food safety issues.	Three grants offered throughout life of program	Four grants were offered during this project: Claire Hedges (<i>V. parahaemolyticus</i>) 2022/23; Maddie Petrusic (Vibrio depuration) 230/204; Felipe Henriquez (rapid marine biotoxin indicators) 2023/2024; and Ben Gray (chemical contaminants in seafood) 2023-2025. This includes an additional \$20,000 than originally planned, moved from summer studentships due to the success of the program.	Supporting our next generation of food safety experts has the double benefit of increasing our knowledge on key issues of concern and building a job-ready cohort for employment either in research or in roles that support the future of our seafood industry. Two recipients are already working in relevant roles (Claire is now a valued SafeFish team member, and Ben is collaborating with the NSW DPI on recalcitrant pesticides in NSW cockles).
Creating training and development opportunities, enabling succession of key expertise.	Build technical capability by offering summer studentships to work with the SafeFish team.	Four studentships offered throughout life of program	<ul style="list-style-type: none"> • Two summer students employed at UTAS to assist in SafeFish work and learn from SafeFish staff. Kate Ollerhead assisted in the preparations for the chemical contaminants workshop and James Brady assisted in project work on marine biotoxins. • Two studentship funds were used to sponsor additional PhD candidates for 2023-2025 (see above) 	Building capability in this manner has assisted SafeFish to deliver well researched work and build capability in food safety. Kate is now employed by the Tasmanian Government supporting industry with marine biotoxin risk management, James is continuing further studies but will be maintained as a casual staff member at UTAS for future SafeFish work.

Strategy	Activity	Performance Measure	Achievements	Impact
Addressing laboratory capability and capacity, particularly where market failures occur.	<p>Work with government and laboratories to encourage fit for purpose methods for key hazards:</p> <ul style="list-style-type: none"> • Meet with National Association of Testing Authorities (NATA) to discuss national reference methods. • Laboratory survey to determine Vibrio method capability in Australia. • Review and report on fit for purpose methods for industry and regulators. • Participate in national laboratory capability forum 	No current metric for performance assessment.	<ul style="list-style-type: none"> • Vibrio method summary FAQ Jul 23 and Vibrio seafood industry FAQ Jul 23 developed • Could not resolve the removal of the Vibrio quantitative test as a national standard, replaced with a qualitative test method. However, quantitative method extensions were identified. • NATA accredited laboratories for the Vibrio qualitative method were identified. • Attended national laboratory capability forum meetings in Feb 2022, Jun 2022 and Feb 2024. 	<p>Understanding the testing tools available for Vibrio analysis and the limitations of each assists government and stakeholders to determine which test to use for the which purpose, ensuring the best outcomes for risk management.</p> <p>Raising the need for quantitative testing at the national laboratory capability forum will pave the way for inclusion of a quantitative test in the national standard when an appropriate test is developed and validated.</p>

Objective 3: To implement governance and engagement to SafeFish to facilitate cost effective, efficient and timely operations and to maximise impacts.

Strategy	Activity	Performance Measure	Achievements	Impact
SafeFish governance aligns with contemporary Australian best practice	Maintain contemporaneity for the SafeFish group by reviewing the Charter every grant cycle and updating as required	Review and revise Charter once per program cycle	Charter of Operations (version 6) was reviewed and revised in 2023 to include representatives of Aquatic Plants and recreational fishers as permanent observers.	Representation from a wide range of stakeholders enables us to consider all aspects of seafood safety in Australia. Our strong governance ensures the objectives of SafeFish are clear, as are the roles of all participants. This assists the Secretariat to manage SafeFish appropriately, building productive, collaborative partnerships and ensuring appropriate extension and adoption of our work

Strategy	Activity	Performance Measure	Achievements	Impact
SafeFish governance aligns with contemporary Australian best practice	Regular meetings with SafeFish Partners and funders to discuss SafeFish activities.	<ul style="list-style-type: none"> • Three meetings per annum • Independent Chair/s contracted for project term 	<ul style="list-style-type: none"> • All meetings were successfully conducted for 2021-2025 • The Independent Chair position was called for in 2021 after critical evaluation Dr. Marion Healy was selected as the preferred candidate. A contract was entered into for 2021-2025 term 	<p>Provides SafeFish partners with the opportunity to directly influence and contribute to SafeFish activities.</p> <p>Provides a mechanism to communicate SafeFish research, resources and other outputs to the partner representative groups.</p>
SafeFish governance aligns with contemporary Australian best practice	Review budget regularly and implement appropriate diligence regarding contracting.	Budget reported yearly in Annual reports	Completed annually over life of project	The SafeFish budget is managed in a transparent manner in accordance with the contracted research.
Communication with stakeholders is effective	Communication Strategy and Extension & Adoption plans are updated and progress reviewed regularly	<ul style="list-style-type: none"> • Progress against strategy reported in milestone reports • FRDC stakeholder feedback indicates SafeFish services are appropriately known and valued • Engage with FRDC extension officers to disseminate outputs & assist with adoption 	<ul style="list-style-type: none"> • Extension and Adoption Plan (Version 3.0) revised 2023 (attached to final report) • Communication Strategy (Version 5.0) revised 2023 (attached to final report) • Strategy and Performance Plan (Version 1.0) developed 2024 and progress against this reported in all subsequent milestone reports (attached to final report) 	Communicating well ensures our collaboration and engagement with our stakeholders is strong, our stakeholders are well informed of our activities and outputs, there is an understanding of the services and tools we provide, we are able to gather information to support our activities, and our outputs are translated to changed practices and policies (where appropriate) in a timely manner.

Strategy	Activity	Performance Measure	Achievements	Impact
Communication with stakeholders is effective	<p>Report activities regularly:</p> <ul style="list-style-type: none"> • Quarterly update, meeting minutes and communiques • Milestone reports • Final reports distributed to stakeholder list as appropriate and put on website • FRDC and state magazine articles • Annual report to all stakeholders 	Communications listed are distributed in accordance with Communication Strategy and Activities & Extension Plan.	<ul style="list-style-type: none"> • 13 quarterly updates, meeting minutes and communiques developed for partner meetings • 7 project milestone reports delivered • 11 reports prepared on project work • 7 magazine articles prepared for industry stakeholder publications • 4 annual reports prepared and distributed on all SafeFish outputs. 	Communicating effectively with stakeholders is crucial for the success of the SafeFish program. Building trust and credibility through transparency and responsiveness to our stakeholders needs allows us to foster collaboration and engagement and to inform them of our activities and outputs.
Communication with stakeholders is effective	Survey stakeholders for effectiveness and preferred communications.	Survey of all SafeFish stakeholders (once per grant cycle)	Stakeholder survey (Appendix 5) was completed in Oct-Nov 2025 by 35 participants (with a 67.9% completion rate). Virtual survey contained 13 questions on value, satisfaction of services and areas for improvement. It was sent via email to 326 stakeholders and included as a pop up on the SafeFish website (triggered n=350). Satisfaction with SafeFish' overall performance was high (85%).	Listening to our stakeholders improves our activities and communication and extension strategies through assessing our performance and the preferred ways in which our stakeholders prefer to engage.
Communication with stakeholders is effective	<ul style="list-style-type: none"> • Attend Partner and funder meetings as requested. • Attend relevant seafood conferences and events. 	Number of meetings attended.	<ul style="list-style-type: none"> • 255 partner/funder meetings attended • 13 conferences attended • 44 workshops, webinars, symposiums attended • 10 Training session attended externally • 10 workshops/webinars/training sessions delivered by SafeFish • 26 presentations delivered by SafeFish to stakeholders 	Attending these events helps to enhance professional development of staff through networking, delivering presentations, and staying updated with industry trends/needs. They also foster collaboration and can lead to valuable partnerships and recognition of SafeFish and what it can provide.

Strategy	Activity	Performance Measure	Achievements	Impact
Networks are maintained to enable action when needed	Support productive partnerships between industry, government and researchers to enable utilisation of research findings and to facilitate considered responses to food safety issues.	<ul style="list-style-type: none"> • Maintain communication list of key personnel and roles. • Participate in or run specific technical committees/working groups as needed. 	To date we have 316 stakeholders on our distribution/communication list. This is comprised of 214 Industry, 42 Researchers and 60 Regulator/Government stakeholders. Our networks in government extend to health, primary industries and biosecurity in each state and territory.	Our strong networks have a direct impact on the extension of our work. Our success in implementing change in policy and practices and the high level of participation in our events is evidence of this.
Collaboration to increase impact	SafeFish engagement is designed to include wide range of stakeholders	Numbers of steering and working groups involved during the project term.	Included in meeting figures attended above. Stakeholders include seafood industry, government and service providers (researchers, consultants, laboratories etc.).	Engaging with our stakeholders effectively fosters trust, collaboration and support, leading to better project outcomes and smoother execution, and ensuring our work aligns with industry needs.
Collaboration to increase impact	Strategic direction, decision-making and delivery is a shared responsibility.	Stakeholder in-kind hours on steering committees, meetings, events and workshops during the project term.	18 stakeholders participated in 6 SafeFish steering committees, contributing on average 4 hours each. 273 stakeholders have participated in 12 SafeFish workshops, contributing up to a day each. 9 unpaid reviews on reports, regulations, positions papers, legislation, and proposals completed	Including our stakeholder in decision making roles ensures they have input into the outcomes of SafeFish activities. Reviewing stakeholder documents recognises SafeFish as a provider of technical advice/expertise. It allows us to ensure that food safety in seafood is considered and that the Australian seafood industry is represented in a risk commensurate manner.
Collaboration to increase impact	Provide technical representation to national committees and forums:	Number of meetings attended per year.	Included in meeting figures attended above. In-kind representation of SafeFish at: <ul style="list-style-type: none"> • FSANZ incident response forum • ASQAAC • Seafood Export Consultative committee • Department of Agriculture, Forestry and Fisheries (DAFF) seafood market access prioritisation • NRS technical review committee • New Zealand Seafood food safety review panel • FSANZ ad-hoc committees • Australian Food Safety Research Alliance committee 	Attending these forums lifts the SafeFish profile as a provider of independent technical advice and expertise in seafood safety and market access. It also allows us exposure to a range of stakeholders at different levels. The meetings also provide a rich source of information back into the program to ensure we are on-top of current issues.

Discussion

SafeFish is a unique food safety and market access research platform for the Australian seafood industry that has been successfully operating since 2010. This grant, covering July 2021 to June 2025 has seen the project align with the FRDC and our partner industries strategic planning cycles, with the aim of embedding food safety and market access activities within our seafood sectors' 5-year plans.

The work conducted by SafeFish from 2021-2025 has followed our proven template for successful delivery:

- Robust identification of current and emerging issues, followed by collaborative prioritisation by funders and partners.
- Proactive research and capability development activities on prioritised issues.
- Strong collaboration, communication and engagement with government and industry to maximise impact by ensuring uptake of research outputs and participation in training exercises.
- Provision of reviews and submissions to international and domestic standards under development to ensure evidence-based, risk commensurate approaches that reflect the Australian context.
- Technical assistance to industry and government during food safety incidents.
- All underpinned by transparent governance.

Notably in SafeFish 2021-2025 we developed a [Strategy and Performance](#) Plan that clearly articulates our strategies to meet the objectives of the program. The document has assisted us to monitor, evaluate and report on key activities and outcomes that SafeFish delivers to ensure that we are meeting the needs of our funders, partner members and broader stakeholder group. Specifically, this framework aims to drive:

- **Monitoring of performance** of SafeFish against contracted activities.
- **Demonstration of impact** of our activities.
- **Accountability** to our stakeholders, partner members and funders
- **Compliance** with requirements set under our Funding Agreement with the FRDC
- **Continual improvement** in the effectiveness, efficiency and appropriateness of resources allocated, partnerships, communication, governance and internal systems and processes.

This tool has been useful for the SafeFish team as we have progressed through the project term. We have also used this framework as a means of communicating our achievements and impact to stakeholders in our annual reports, milestone reports to the FRDC and for this final report. The framework has proven to be effective and efficient and will be used in future years.

Objective 1. Deliver robust food safety research and advice to industry and regulators that underpins Australia's reputation as a producer of safe seafood.

The prioritisation of food safety and market access issues is a keystone in the SafeFish' success. In the past we have employed a data-driven approach that collates a variety of information from multiple sources, provides an evidence-base for decisions and raises awareness of each issue among our government and industry stakeholders. Drawbacks to this approach are that data is often slow to become available, may not be available in appropriate formats, or can be confidential in nature and not able to be shared. In SafeFish 2021-2025 we supplemented the data-driven approach with an expert-opinion process – our Risk Register. Expert opinions have the advantage of timeliness and potentially allow a wider range of stakeholders to contribute to the process.

The National Risk Register provided a structured, yet simple methodology, to identify and prioritise the most critical and material risks to industry. This qualitative methodology, generally supported the

conclusions of the data-driven approach but listed a broader range of topics, identifying 32 risks (5 critical and 10 high risk). The top 5 most critical risks were: increased presence, virulence and challenges of *Vibrio species*, climate change impacts, geopolitical uncertainties for trade, industry not adapting effectively to traceability and authenticity needs, and increasing harmful algae blooms with low awareness of biotoxins and ciguatera.

The register is a useful tool to allow businesses to make better and informed decisions toward their strategic planning and funding; raise awareness and educate their teams around the importance of risk management practices; and build resilience and preparedness for top risks. The work was however very time intensive and required significant input from our industry and government partners. Roll out of this program was most effective in industries with “a burning food safety platform”, for example, the oyster industry with the emergence of human health outbreaks related to the pathogenic bacteria *V. parahaemolyticus*.

An important and impactful element of the risk register work was the Vibrio Risk Road Map which guided the concerted effort we have made in this project to address risk from *V. parahaemolyticus*. This pathogen has caused >300 illnesses in Australia over recent years in association with oysters. In New Zealand it has also been causing illness in association with a broader range of seafood, including abalone, lobster, mussels, and urchin roe. Here, industry, government and researchers took a holistic approach, examining all the hurdles preventing effective risk management from farm to fork, including fundamental knowledge gaps, a lack of analytical methods, varied and ineffective reporting requirements and supply-chain traceability. The process not only built important networks and a community of practice but also identified clear action points for mitigating Vibrio-related risks, especially for bivalve producers. Additionally, the program activities informed policy discussions, influenced food safety guidance, and supported national notifications of illness of *V. parahaemolyticus* in Australia, enabling timely interventions of outbreaks. Collaboration and industry-wide engagement were essential to these successes, bridging gaps between research and industry practice to develop more informed mitigation strategies. The success of this work provides a template for handling other complex issues where stakeholders are highly engaged.

The increased funds allocated to research in SafeFish 2021-2025 has allowed us to undertake fundamental research into *V. parahaemolyticus*, through building collaborations with health departments, public health and environmental researchers. The research to gather Australian whole genome sequences creates an important resource for future research in Australia and builds the knowledge that we require prior to the development of standards for risk management. 682 whole genome sequences, half clinical and half environmental, were opportunistically gathered and compared. The results provide a picture of the common pathogenic genotypes in Australia and the variability and spread of non-pathogenic genotypes. The collaboration with health professionals is planned to continue as we adjust to managing this complex pathogen. Whilst conducting the work we also built capability in bioinformatics through a bespoke workshop and raised awareness of the outputs through a science symposium including Australian and New Zealand professionals and industry in May 2025. In addition, by undertaking an economic study of the costing of a South Australian *Vibrio* outbreak we characterised the significant financial impact of product contamination by this pathogen, encouraging a balanced dialogue on the cost of prevention.

Other substantial work undertaken within this project has been the web-based toolbox for *L. monocytogenes* and the review and recommendations for monitoring of chemical contaminants in seafood. *L. monocytogenes* is an opportunistic pathogen that is widely distributed in the environment and can be associated with ready-to-eat seafood and a range of other foods. Given the serious consequences of listeriosis (illness cause by consuming foods contaminated with *L. monocytogenes*) for pregnant women (miscarriage and premature delivery) and for those with weak immune systems (potentially fatal), it is vital that food producers pay the utmost effort to reducing *L. monocytogenes* contamination and growth in their product. *Listeria* management programs can indirectly help manage other foodborne pathogens. Our easy-to-use toolbox identifies existing high quality training materials

for all aspects of the production and supply chain, assisting industry to train staff and maintain best-practice. The toolbox is a direct response to our previous working in the ready-to-eat space that identified *L. monocytogenes* training as an issue that required attention along the supply chain.

Growing concern over both real and perceived health risks from chemical contaminants in seafood is expected to intensify as chemical use and runoff increase under changing climate conditions. Advances in scientific understanding of chronic health effects at low concentrations, coupled with improved detection technologies, have led to progressively lower maximum allowable levels to safeguard human health. Australia's monitoring system for heavy metals and agricultural and veterinary chemicals is diverse, with the National Residue Survey (NRS) forming a key component for export certification. An independent review of this system has been completed, assessing the residue testing framework for exported Australian seafood, the rationale and legislative drivers behind the NRS, emerging contaminants, and examining similar international programs. The review also explored future improvement options and engaged stakeholders to capture their needs and expectations. Findings confirmed that the NRS is critical for market access and highly valued, but in some cases enhancements could be made to coverage, analyte scope, usability, confidentiality, incident readiness, and affordability. Recommendations include maintaining the NRS as a national baseline and implementing immediate low-cost improvements such as clearer communication; introducing targeted sector programs for high-value or higher-risk markets; and providing flexible assurance options for industry.

Long-standing activities on the SafeFish agenda are participation in Codex Alimentarius Commission food standards and guideline developments and response to World Trade Organisation SPS notifications. It is now over 10 years since many of the standards for Fish and Fishery Products were developed by the Codex Alimentarius, and several standards and guidelines are now under review. It is important that Australia participates in these reviews to ensure the standards development considers data and knowledge from Australia and where possible align with our current risk management strategies to prevent trade barriers arising. Review of SPS notifications led to alerting industry to changes in importing country standards for mercury, arsenic and isoeugenol in seafood. Our submission to DAFF supported Australia's response to the EU proposed levels of inorganic arsenic as these maximum levels are not achievable in some seafood. Several other countries responded in the same manner, and the EU has now revised the proposed MLs to be more achievable.

During SafeFish 2021-2025 we had strong input into the Codex Committee on Food Hygiene (CCFH), in particular the revision of the Guidelines on the Application of General Principles of Food Hygiene to the Control of Pathogenic *Vibrio species* in Seafood. We ensured that the text provided defined temperature requirements to limit growth of *Vibrio species* and also that the guidance for sampling plans and appropriate analytical methods provided decision tools that include the specific purposes of analytical testing, choice and types of analytical methods. We have sent technical representatives to CCFH meetings to support the Australian delegates for both the *Vibrio* and the water re-use guidelines. In the Codex Committee on Contaminants in Foods (CCCF) we provided input into development of the Code of Practice for the Prevention or Reduction of Ciguatera Poisoning where we ensured that the text included the importance of accurate epidemiological data for successful surveillance and monitoring of ciguatoxins, that competent authorities had the flexibility to consider developing MLs when there was sufficient data and addressed practicalities on sampling and limitations on analytical methods and facilities. Input into both Committees was supported by researchers and government regulators who spent considerable time reviewing and revising the working documents.

We have also been contributing to the development of domestic standards. In September 2022, SafeFish submitted an application to FSANZ on behalf of the Australian Shellfish Quality Assurance Advisory Committee to review the Food Standards Code Maximum Levels (MLs) for two highly toxic marine biotoxins, to bring them into alignment with international standards based on recent risk assessments. The application included a review of current data available for Australian bivalve shellfish to assess economic impact of any change, which was determined to be minimal. The adopted changes ensure greater safety for seafood consumers and provide a level playing field for

domestic and export production. We have also assisted FSANZ to review the section for *Vibrio* in the Microbiological Compendium, aligning the text with our current knowledge base.

Objective 2. Maintain and enhance the capabilities in seafood food safety in Australia.

A substantial development in SafeFish 2021-2025 was the sponsorship of summer students and PhD students. The summer students, although difficult to organise timing-wise to align with current SafeFish activities, assisted with background research, building their knowledge of the Australian food safety regulatory system for seafood and the importance of this for trade and market access. Through advertising three rounds of PhD scholarships of \$10-20K per round we built awareness of our high priority issues with the Australian research community, encouraged research in these areas and supported the development of the future generation of researchers. A strong future capability for research is becoming increasingly important in our changing environment, and through building linkages with our successful students and the seafood network we are assisting the next cohort of researchers to see the future applications of their research and build their networks and communications skills. Two of our sponsored students are now working in relevant food safety areas: one within government and one at the University of Tasmania, showing we are contributing to job-ready graduates for our sector.

During SafeFish 2021-2025 we have conducted webinars on *V. parahaemolyticus* and microplastics in seafood, both hot topics in the seafood industry and in the media. These professionally recorded presentations, available on our website, have been very popular with a wide range of audiences. We will develop this aspect of extension further in SafeFish 2025-2030, bringing subject matter experts to discuss contentious or emerging issues of concern.

Similarly, our Food Recall Workshops to prepare industry for incidents in the market were popular, received high praise from attendees and will be continued in the future. Under State legislation, Food Recall Plans are a necessity for all food producers involved in wholesale supply, manufacture or importation of food, however few have ever tested their plan or had to put it into action. Faster action during incidents significantly reduces the impact on economic and reputational losses, and our workshop participants all agreed they were better prepared following the course.

During each SafeFish grant we come across large scale issues that are not able to be addressed within the scope of the current grant. In these cases, we assist to draft the terms of reference for contracts, calls for expressions of interest, or to develop project proposals with the stakeholders involved. For SafeFish 2021-2025 we assisted to set up a research project to respond to the disruption of the live lobster trade to China (FRDC 2020-092), a project to build training courses to lift food safety capability for the oyster industry and government stakeholders (FRDC [2021-053](#)), and developed two FRDC Expression of Interests for research activities to examine seafood fraud in Australia in collaboration with other FRDC Foundational Services (Seafood Industry Australia, Fish and Aquatic Plant Names, Human Dimensions Research Coordination Program, Aquatic Animal Health and Biosecurity Coordination Program) and to investigate ciguatera poisoning risk in the Coral Sea fishery. At the other end of the spectrum, we have answered >135 smaller scale questions for government and industry providing timely support with trade and market access questions and food safety risk management options.

Objective 3. Implement governance and engagement of SafeFish to facilitate cost effective, efficient, and timely operations and maximize impacts (new strategic objective added during project).

Critical to the work of SafeFish is our strong governance, detailed in our [Charter of Operations](#), Communication Strategy and Extension and Adoption Plan. All were updated in SafeFish 2021-2025. These documents assist us to ensure our objectives and processes are clear, the roles of our stakeholders are well understood, and we continue to maintain and build productive partnerships enabling the appropriate extension of our work. Our strong governance and communications are assets

that has proven to support and enhance our work, securing better impact for our activities, as evidenced in the Strategy and Performance Plan presented above.

We would also like to acknowledge the guidance of our Chair Dr. Marion Healy PSM. The role of Independent Chair is incredibly important to the success of SafeFish, providing balance and objective review of proposed activities and processes. Marion has strengthened our governance and networks and provided strategic direction to our broad range of research and extension activities. She has also mentored our growth as individuals, strengthening our ability to provide value to the seafood community. We see the role of Independent Chair as essential to the stability and long-term future of SafeFish.

Conclusion

SafeFish 2021-2025 has successfully delivered on the objectives to 1) deliver robust food safety research and advice that underpins Australia's reputation as a provider of safe seafood; and 2) to maintain and enhance the capabilities in Australia to provide that research and advice in a cost effective, efficient and timely manner. Our strategies and activities undertaken to reach these objectives are clearly outlined in our Strategy and Performance Plan presented in Methods and Results. Our success is based on a team approach with a broad range of stakeholders. The contributions of our stakeholders as funders, partners, steering committee members, workshop attendees, reviewers, extension networks, conduits for government, contributors to Codex Alimentarius, providers of strategic direction, and participation in our work in general is what makes this such a successful project and sees the uptake of our work result in changed policy and practice at a variety of levels.

Our traditional streams of activities in prioritising issues, responses to Codex and SPS notifications, enquiry lines, fact sheets, and incident response have continued to provide value for our government, industry and other stakeholders. The SafeFish website has been an invaluable tool to showcase our work and make information readily available, with a growing user base.

Improvements to our traditional streams of activity have been:

- Increasing the budget for each research topic, enabling us to delve deeper into complex issues. This has proven particularly successful for the *Vibrio*, chemical contaminants and *Listeria* work. Whilst we have necessarily reduced the number of topics that we work on, the significant progress made in each area has justified this approach.
- Conducting webinars instead of face-to-face seminars on topics of interest. This has enabled us to involve national and international experts as well as broaden the audience. By making these webinars available on the SafeFish website, they remain a valuable resource into the future.
- Building capability through PhD and summer student programs. These programs bring additional knowledge as well as building a workforce for the future.
- Incorporating expert opinion into our data-driven prioritisation process. This has proven particularly successful when it can be extended to an actionable road map for burning platform issues such as *Vibrio*.

The collaborative approach used by SafeFish allows research to be conducted on high priority issues, which in turn informs SafeFish technical advice, allows input into the development of international and domestic standards, assists in the resolution of trade and market access issues, and assists with food safety incident management and risk management in general. The value of the SafeFish model is that the collaborative approach encourages the research outputs to be directly converted to outcomes with benefit for Fisheries and Aquaculture sectors and regulators alike. By working together through the SafeFish structure, our funders and partners leverage their relatively small investment into high value impact through changed policies and practices and strong co-operative networks.

Implications

The SafeFish pathway to impact is well proven. We prioritise our workload to areas where there is clear need - either through standards/market access negotiation, food safety incidents or addressing high priority food safety risks. By involving all stakeholders in the process of prioritisation, project design, and communication of outputs, we ensure that the research is designed to meet the stakeholder need (e.g. knowledge of a specific risk in a specific area, risk assessment or risk management options), and by having key stakeholders involved at inception means uptake of the results generally occurs rapidly.

Importantly our strong networks with partners in the federal and state governments are instrumental for adoption of research outputs into risk management policy. Similarly, our capability and capacity activities are targeted at both industry and service providers (government, researchers and consultants) to ensure the whole seafood network is well supported. Strong networks also have the advantage of building trust and relationships between industry and their supporting government bodies, resulting in better outcomes for both sectors, particularly when incidents arise.

We have detailed our impact in the methods and results section of this report. Summarised highlights and their implications for specific stakeholder groups are listed below.

Review of domestic and international standards and guidelines/programs

- Our chemical contaminants work addresses the NRS, a highly important trade support mechanism managed by government under a levy system from exporters. This is a sensitive, complex, and controversial topic causing angst between government and industry. Our work has detailed legislated requirements for the program and industry expectations. It has highlighted the importance of the NRS and the high value placed on this program. It has also suggested some avenues for improvement, ranging from business-as-usual with communication enhancements through to the development of specific enhanced programs for industries with sensitive markets that are willing to pay additional fees. **Government and industry will need to carefully consider the options put forward and take appropriate action.**
- Our technical representation at Codex meetings, as well as submissions considering Australian conditions when developing standards and guidelines has ensured they are risk commensurate, evidence based and reflect the Australian situation. This results in standards and guidelines that are not restrictive to trade. Our submissions have resulted in changes to text with respect to accuracy of surveillance data, flexibility for regional risk management dependent on available information, practicalities on sampling and limitations on methods of analysis. **Work at Codex will be ongoing, particularly whilst the guidelines for control of pathogenic *Vibrio* and *Listeria* are under development/review respectively. Government regulator and researcher input are particularly useful at this stage.**

Adaptions to government policy

- Our *Vibrio* work has been a key input into the gazetting of illness from *V. parahaemolyticus* as a nationally notifiable disease in 2025. Notifiable status means laboratories must report illness to health authorities immediately, reducing the time for public health response such as determination of clusters of illness, traceback to food source and farm, and issuing of cease harvest notices. This faster action will reduce the scale of future outbreaks in terms of number of illnesses by removing risky product from the market. It will also allow identification of chronic low levels of illness and follow up investigation. **The gazetting of *V. parahaemolyticus* as a nationally notifiable disease is expected to result in higher reporting of illnesses from this pathogen. Government and industry should be prepared with policies and plans on how to**

respond. As many State Government policies are relatively new, flexibility is likely to be needed to adapt them based on learnings from each event.

- A new guidance section for Vibrio risk management has been added to the Australian Shellfish Quality Assurance Program's Operations Manual that incorporates our work and the results of the surveys of growing areas. This section is generic at this stage due to the lack of fundamental knowledge supporting risk management but highlights the need for states to take action to understand risk and respond to incidents when they arise. **ASQAAC members should maintain a watching brief on research and update guidance as needed.**
- The harmonisation of the national Food Standards Code maximum levels for marine biotoxins in bivalve molluscs reflects international risk assessments for these highly potent toxins, reducing the allowable level. Our regulatory impact assessment showed minimal impact on commercial harvest of bivalves. A benefit is that the standards for export and domestic supply are now the same. **Commercial laboratories have adapted their analytical output to report in the standardised units. Government regulators need to be aware of the changes.**
- SafeFish staff sit on 8 government committees, providing technical input to progress issues of importance to both government and industry. We provide an independent voice that supports policy development and activities that are underpinned by science and reflect current context of the seafood industry.

Improved industry practices and awareness

- Our prioritisation processes (including the risk register) highlight current and emerging food safety risks. **Seafood sectors and businesses within them should review their practices in these areas, revise where necessary, and direct appropriate resources to further actions if warranted.** This work also identifies areas where there is benefit in collaborating as an industry or with other seafood sectors
- The Vibrio Risk Road Map associated research, webinars, fact sheets, and seminars has fed into industry harvest guides to reduce risk. **Seafood businesses should be aware of the resources available to them and change their practices as necessary to minimise risk from Vibrio.** For example, businesses can change their harvest timing, time to refrigeration post-harvest, and temperature control in supply chain. Many businesses have purchased on-site refrigeration as a response to these guides. Whilst it is difficult to quantify the impact from this, a significant reduction on risk at harvest and at sale is expected, reducing illness burden.

Capability development – industry and government supporters and researchers

- Our Food Recall Workshops have upskilled businesses in rapid response to incidents, reducing economic and reputational burden should they be involved in an incident in the future. They have also assisted industry to meet their legislated responsibilities as a food business. **The Food Recall Workshops will be repeated in the future and businesses should take advantage of the opportunity to improve their incident response systems.**
- Our Fact Sheets and FAQs inform industry and consumers of risks and consequences. They are an important primary source of information to explain each hazard.
- Our stakeholder enquiries line reduces hurdles for safe food production and trade by quickly answering variety of questions, ranging from hazard sources, testing methods and availability, best practice for risk management, identification of expert support, and the identification and interpretation of domestic and import requirements.
- Our *Listeria* web toolbox upskills industry stakeholders along the supply chain, regulators and consumers in this opportunistic pathogen by making information and training material readily available. **Seafood businesses, particularly postharvest, should be aware of this pathogen and train their staff in control using the resources provided in the SafeFish web-based**

toolbox. *Listeria* management programs can also help manage other foodborne pathogens.

- Our webinars and seminars at meetings and conferences help to upskill attendees and dispel conjecture by presenting the facts on seafood food safety issues of concern, particularly those receiving current media attention. They also bring together subject matter experts and help to raise awareness and collaboration on issues. ***All stakeholders should review upcoming activities and consider attending themselves or if other colleagues could benefit from SafeFish capability development activities.***
- Our PhD and summer studentships build knowledge and people for a future workforce, supporting food safety in the seafood industry.

Recommendations

We have made several alterations to the SafeFish program in this term. As a result of these changes and through the other activities we have undertaken, we make the following recommendations for the next iteration of SafeFish:

- The data-driven prioritisation process remains the mainstay for efficient identification of priority issues for the SafeFish research and capability development agenda.
- This process is supplemented by an expert-opinion process once every 5 years, potentially added to our stakeholder communications survey.
- Codex Alimentarius and SPS activities should remain a core part of the program given the success of this work and the efficiency of the processes employed. Where appropriate (i.e. for issues of particular importance to Australian seafood), research should align with upcoming topics at Codex, particularly if knowledge gaps exist.
- Incident response has been a major activity during the 2021-2025 project. Flexibility needs to be built into the program to ensure this activity is adequately funded. Consideration needs to be given to delaying/curtailing other activities when major incidents arise.
- The Vibrio Risk Road Map is maintained, with annual updates on progress and meetings as appropriate.
- If an emerging issue is identified that includes risk management gaps at multiple stages in the supply chain, an actionable road map process should be undertaken, along the lines of that which occurred for Vibrio.
- The programmatic approach we have taken towards research has enabled us to delve deeper into each issue and address significant gaps in knowledge, tools or training. As a result of undertaking fewer research projects and continuing research across years, our outputs are more substantial and have more impact. We recommend this model continues.
- Fundamental research continues on *V. parahaemolyticus*, building on the whole genome sequence database and networks we have created.
- Research and extension activities continue into chemical residues in seafood. Of particular interest is agricultural and veterinary chemical in wild harvest seafood, persistent organic pollutants such as dioxins and PFAS, and general surveys to provide data for assessing impact of importing country trade notifications of reducing MLs/MRLs (maximum residue limits).
- Ciguatera should remain high as a research priority as the cause of the highest number of Ciguatera poisoning outbreaks in Australia has been in association with seafood. International collaborations, maintenance of the ciguatera working group and continued efforts to raise awareness of ciguatera in Australia will be necessary.
- We have heard from many of our industry and regulator partners that there is a need to conduct more work in the supply chain to ensure that any ready-to-eat products are fit for purpose, used according to label instructions, and stored and handled in an appropriate manner. Building on previous work in this space, and collaborating with seafood producers and Seafood NZ, we recommend gaining an understanding of practices in the supply chain that are of concern and development of intervention activities to address these.
- Effort is invested in communicating food safety risks to recreational fishers that aligns with their preferred methods of information uptake. The recreational fishing representative on our partnership has made a strong case for this work due to the large number of recreational fishers and the scarcity of food safety information available in the right format for them.

- The PhD and studentship program should continue, although investment in advertising and selecting students was high. We recommend reducing the number of operating grants but including a full time PhD stipend for study of one area in depth.
- Webinars have reached a broader audience with positive feedback and become a key communication tool. It is recommended that this communication tool be expanded.
- The governance of SafeFish continues to be reviewed on a regular basis to provide a strong foundation for the program. The next review of the Charter of Operations and Communication Plan should formalise our process for public release of reports.
- The Strategy and Performance Plan should be reviewed early in the next iteration of SafeFish in a face-to-face meeting of the Secretariat.
- We recommend that the current Independent Chair is retained for a period to ensure continued operation of the program. A new Chair should be sought in year 3 or 4 of the next SafeFish program.
- Succession planning for the program should be undertaken to ensure continued strong leadership and delivery in future years.

Further development

Our funders and partners have agreed to continue collaboration, supporting SafeFish 2025-2030, beginning in July 2025. This provides us with the opportunity to continue our work in line with the recommendations above, and in collaboration with our stakeholders.

Extension and Adoption

SafeFish has developed a formal ‘Extension and Adoption’ (E&A) plan to clearly indicate the SafeFish target audiences, the key messages we are aiming to deliver, and a method/action plan for our communication and research outputs to be disseminated (provided as an attachment to final report).

The significant number of presentations and meetings attended by SafeFish staff, and the wide distribution of SafeFish outputs has ensured that the seafood industry, regulators and other stakeholders are aware of SafeFish and the activities it undertakes. Close engagement with stakeholders and active investment in adoption has helped to facilitate uptake of research into policy and improved risk management practices.

Annual reports from 2021/22; 2022/23 and 2023/24 are available on the SafeFish website and detail the activities and outputs that have been generated for that period. All other historic materials (reports, communiques, updates, articles etc.) are housed on the SafeFish website to ensure free access to any interested party, and new communications are added as they are developed.

The following summarises the E&A activities that have been delivered and how they have been adopted over the life of the project. A full confidential summary of our Activities and Enquiries register is provided as an attachment to the final report.

Item	Method	Adoption
Website	Maintain the SafeFish website with up-to-date activities, Codex reports and research outputs	15K active users to the website over life of project (noting that redevelopment of the website back-end operating system occurred in 2023 therefore analytics captured from this point onwards).
Communications	Articles in Fish, International and State industry magazines, newsletters	7 articles produced for relevant publications over 2021-25
	Updates and Snippets in Seafood Trade Matters	Updates provided upon request
	Meeting minutes, communiques and agendas	14 partner meetings conducted with minutes, communiques, update and agenda produced for all.
	Production of industry-ready brochures, fact sheets, Q&A	3394 views of fact sheets and/or FAQ
	Codex review and input	249 views of codex related material 15 calls for industry comments or notifications of Codex actions 10 notifications of changes from SPS notifications 16 responses to Codex notifications 8 responses to working groups 1 response to an SPS notification 3 technical representees sent to Codex meetings
	Enquiries	196 separate stakeholder enquiries received and responded to
	Communications stakeholder survey	35 responses received from SafeFish stakeholders on virtual survey
	SafeFish Partnership meetings	14 x partner meetings conducted

Item	Method	Adoption
Meetings	Presentations and workshops to stakeholders	26 x facilitated by SafeFish between 21-25
	Industry meetings and conferences	365 meetings attended between 21-25 16 conferences attended 10 Training sessions attended
	Prioritisation process (hazard identification, scoping, workshop)	Workshop completed in June 2022. Attended by 14 stakeholders
Reports	Annual report Milestone reports	4 annual reports prepared and sent to full Distribution List (>316 stakeholders). 7 milestone reports prepared for FRDC
	Technical and project reports	Listeria in RTE seafood Contaminants in seafood workshop report (confidential) Contaminants in seafood review: <ul style="list-style-type: none"> Contaminants in Seafood: NRS review - Issues Paper Contaminants in Seafood: NRS review - Options Paper Contaminants in Seafood: NRS Review - Final Recommendations Report (confidential) Contaminants in Seafood: NRS Review – 1 Page Summary Risk register project <ul style="list-style-type: none"> National Seafood Risk Register Bivalve Risk Register Prawn Risk Register Vibrio project <ul style="list-style-type: none"> BDO Economic Analysis of SA Outbreak
	Peer review	Informal external review of the 'Economic Analysis - Pacific oyster 2021 <i>V. parahaemolyticus</i> outbreak'
Capability Development	PhD/Master student	Claire Hedges 2022/23 Maddie Petrusic 2023/24 Felipe Henriquez 2023/24 Ben Gray 2024/25
	Summer student	Kate Ollerhead 2023 James Brady

Item	Method	Adoption
	Workshops/webinars/training	Vibrio Science Day 2022 (49 virtual, 37 in person attendees) Contaminants in seafood 2023 (37 in person attendees) Microplastics webinar 2024 (75 virtual attendees) Recall workshops x 4 2024 (23 in person, 28 virtual attendees) Shellfish safety training 2024/2025 x3 Vibrio Whole Genome Sequencing Workshop and Training 2025 (11 in person) Vibrio Symposium (May 2025) (50 attendees virtually, and in person)
Other	Incident response	<ul style="list-style-type: none"> • Isoeugenol anesthetic used in seafood • Cadmium in Rock-lobster export to China 21-25 • SA Vibrio Outbreak (21-22) • NSW Vibrio Outbreak (Jan – Mar 2024) • Brevetoxin in SA Outbreak (Mar 2025 ongoing) • Florfenicol in Atlantic Salmon (Nov 2025 ongoing)

Project coverage

Media, industry or government articles on the project include:

Type	Date	Publication	Details
Interview	11/11/2021	ABC Radio https://www.abc.net.au/radio/programs/tas-country-hour/tasmanian-country-hour/13617812	Program Manager (Alison Turnbull) was interviewed on The Country hour: Climate change affecting shellfish
Magazine article	Feb 2022	FRDC Fish Magazine	Ready to eat seafood: Challenge accepted
Conference proceedings	Feb 2022	International Conference on Harmful Algae	Raising awareness of ciguatera poisoning in Australia: A survey of recreational fishers
News article	Mar 2023	FRDC Fish News/IMAS News	Building safety and resilience in the Australian seafood industry
News article	Apr 2023	IMAS News, Tasmanian Seafood Industry Council News, Fish Bites, Taroona Community News	Researchers help preserve Australian seafood exports into Europe
News article	Jun 2023	FRDC Fish News	SafeFish Postgraduate Grant
News article	Jun 2023	Australian Institute of Food Science and Technology - Food Australia	Building food safety and market access resilience in the Australian seafood industry
News article	Nov 2024	IMAS socials, SARDI socials, FRDC Fish News	Food Safety awareness
Interview	20/02/2025	ABC News NSW southeast https://www.abc.net.au/listen/programs/southeastnsw-breakfast/breakfast/104943598	Dr. Andreas Seger was interviewed on behalf of SafeFish on Ciguatera and seafood poisoning

Technical Reviews

Technical reviews of documents, standards, and submissions requested by stakeholders.

Date	Document	Stakeholder	Details
	Handbook of business rules: Seafood Market Access Prioritisation	DAWE Export Branch	SafeFish is part of the newly established Seafood Market Access Working Group for DAWE. This was a review of the terms of reference for the working group, including the processes to be used and criteria for assigning categories and priorities to issues.
	Guide to buying and selling seafood in Tasmania	Tas Seafood Industry Council	Industry facing guide on seafood industry food safety regulations in Tasmania.
	FRDC submission to the Food Security Inquiry	FRDC Ewan Colquhoun	Review requested by FRDC. SafeFish included minor comments on human capital needs in food safety and climate change impacts.
	DAFF response to EFSA on state of play for Vibrio in Australia	EFSA/DAFF	Completed the sections for Australia at request of Mark Phythian (DAFF).
Apr 2024	FSANZ Act review	FSANZ – Food Safety Research Alliance	A group response was put in through the FSRA. Reviewed responses and added comments as appropriate.
Jun 2024	SIA Communications Position Paper - Food Safety and Biosecurity	SIA	Based on meetings with SafeFish and others. No revisions required
Jun 2024	FSANZ Compendium for Microbiological Criteria	FSANZ	Feedback on the new draft seafood chapter in the FSANZ Food Standards Code - Compendium of Microbiological criteria for Food.
Jan 2025	SIA Legislation and regulations relevant to seafood production in Australia	SIA	Lists all State and Commonwealth legislation. Large food safety section, assisted by Mark Boulter.
Jan 2025	Proposal to FSANZ to exempt Black-lip Rock Oyster (BRO) from Cadmium Food Standards	Barry Fields on behalf of NT Government	Proposal to exempt BRO from Food Standards Code (FSC) MLs due to high natural levels. Cadmium working group of ASQAAC.

Project materials developed

The following is a list of all project materials that have been developed during the 2021-2025 SafeFish project:

Applications

- Turnbull, A, Dowsett, N. and Seger, A. (2021) Application to FSANZ – Biotxin harmonisation. (September 2021).

Fact Sheets

- [Use of Isoeugenol based anaesthetics – FAQs and Information for Australian Seafood Businesses](#) (November 2023).
- [Microplastics in Seafood](#) (May 2023).
- Dowsett, N and Turnbull A. (2023) Talking points for vibrio outbreak and update to [Vibrio Fact Sheet](#) (June 2023).
- [Neurotoxin Shellfish Poisoning](#) (July 2025)
- Turnbull, A and Dowsett, N. (2023) [Cadmium in Crustacea – FAQs Information for Australian Seafood Businesses.](#) (May 2023)
- Hedges, C and Turnbull A. (2023) [Vibrio FAQs for the Seafood Industry.](#) (July 2023)
- Hedges, C and Turnbull A. (2023) [Vibrio parahaemolyticus – summary of available test methods and considerations for commercial laboratory analysis in Australia.](#) (July 2023)

Journal Articles

- Harlock, M., Quinn, S., and Turnbull, A. (2022) [Emergence of non-cholerae Vibrio infections in Australia.](#) Communicable Disease Intelligence, Volume 46.
- Gray, B.T.C; Champion, C.; Broadhurst, M.K; Coleman, M.A.; Benkendorff, K. (2025) [Efficacies of cooking and depuration for reducing current-use pesticide residues in wild-caught giant mud crabs \(*Scylla serrata*\).](#) Frontiers in Marine Science, Volume 12.

Conference Proceedings

- Seger, A., Dowsett, N., Turnbull, A. (2021) [Raising awareness of ciguatera poisoning in Australia: A survey of recreational fishers.](#) University of Tasmania. Report. <https://hdl.handle.net/102.100.100/495376>. (January 2021).

Reports

- Beatty, T. and Gallagher, J. (2025) [Contaminants in Seafood \(Issues Paper\).](#)
- Beatty, T. and Gallagher, J. (2025) [Contaminants in Seafood \(Options Paper\).](#)
- Beatty, T. and Gallagher, J. (2025) Contaminants in Seafood (Recommendations Report). Confidential report included as an attachment.
- Beatty, T. and Gallagher, J. (2025) [Contaminants in Seafood \(Executive Summary\).](#)
- Dowsett, N. Turnbull, A. Pahl, S. Hedges, C. (2024) [SafeFish Annual Report 2023/24.](#)
- Dowsett, N. Turnbull, A. Pahl, S. Hedges, C. and Malhi, N. (2023) [SafeFish Annual Report 2022/23.](#)
- Dowsett, N. Turnbull, A. Pahl, S. Hedges, C. Malhi, N. (2021) [SafeFish Annual Report 2020/21](#)
- Dowsett, N. Turnbull, A. Pahl, S. Hedges, C. Malhi, N. (2022) [SafeFish Annual Report 2021/22.](#)

- Dowsett, N., Pahl, S., Ollerhead, K. and Turnbull, A. (2023) Contaminants in Seafood review of international and Australian data. Confidential report included as an attachment. (October 2023).
- McCoubrey, D.J. (2022) [Review-of-US-NSSP vibrio-guidance](#). Review for SafeFish and ASQAAC.
- Malhi, N., Dowsett, N., Seger, A., Pahl, S. and Turnbull, A. (2022) SafeFish Prioritisation workshop pre and post reports. 2022. Confidential report included as an attachment. (July 2022).
- Hodgson, K. Pahl, S. (2024) [Listeria in RTE Seafood: Current Control and Risk Management](#). (November 2024)
- Lesseur, C. (2022) SafeFish Actionable Risk Register: Risk Identification for Australian Seafood. [Full Report](#) (May 2022 revised version March 2025).
- Lesseur, C. (2023) SafeFish Actionable Risk Register - Risk Identification for Bivalve Sector. [Full report](#), [two-page summary](#) and [video snapshot](#). (March 2023).
- Lesseur, C. (2024) SafeFish Actionable Risk Register: Risk Identification for Australian Prawns. [Full Report](#) and [two-page summary](#). (September 2024).
- Lesseur, C. and Dodd, M. (2021) [Food safety of short shelf life ready to eat seafood. Understanding the risks and opportunities within the Australian seafood supply chain](#). (September 2021).
- Lesseur, C., Hedges, C., Turnbull, A., Torok, V., Padovan, A., Pahl, S., Gibb, K., Sherlock, R., Phythian, M., Zammit, A., Wilkinson, C., Gill, S., Carman, S., Stamp, T., and Loone, K. (2023) Vibrio Risk Road Map. Confidential report included as an attachment. (February 2023).
- Rust, S. Turnbull, A. Magnusson, A and Carlin, L. (2025) [Economic Analysis – Pacific Oyster 2021 Vibrio parahaemolyticus outbreak](#). BDO/IMAS.

Training

- Boulter, M. (2024) [An Introduction to Shellfish Safety](#). University of Tasmania Short Course Platform.
- Boulter, M. (2024) [Shellfish Safety Supervisors Course](#). University of Tasmania Short Course Platform.
- Boulter, M. (2024) [Managing and Regulating Food Safety Risks in Bivalve Shellfish](#). University of Tasmania Short Course Platform.
- SafeFish Recall Workshop: Hobart. In person workshop. 3/6/2024
- SafeFish Recall Workshop: Port Lincoln. In person workshop. 6/6/2024
- SafeFish Recall Workshop: Virtual. Session 1. 6/11/2024
- SafeFish Recall Workshop: Virtual. Session 2. 8/11/2024
- Ugalde, S. (2024) Post-Event Report – SafeFish Recall Workshops. Confidential report included as an attachment. (November 2024).
- Williams, M (2025) Post-Event Report – SafeFish Bioinformatics Workshop. Confidential report included as an attachment (June 2025)

Travel Reports

- Pahl, S. (2023). Overseas Travel Report for SafeFish 2021-2025: For travel to San Diego (USA) to attend CCFH53 (March 2023)
- Pahl, S. (2024) [Overseas Travel Report to attend CCFH54 in Nairobi \(Kenya\): Report for SafeFish 2021-2025](#). (April 2024).
- Farrington, D. (2024) [Final Report for SafeFish: Attendance at CCCF17 in Panama City](#). (April 2024).

Webinars, Symposia and Recorded Presentations

- Vibrio Science Day: Setting the Scene. [US Vibrio Research: Where we are and where we're going](#). (2022) Dr. Jessica Jones (US Food and Drug Administration). (July 2022).
- Vibrio Science Day: Environmental Research. [Assessing the risk of pathogenic *Vibrio* species in Tasmanian oysters](#). Dr. Valeria Torok (SARDI Food Sciences). (July 2022).
- Vibrio Science Day: Environmental Research. [Vibrios and tropical rock oysters in a climate of uncertainty](#). Dr. Anna Padovan (Charles Darwin University). (July 2022).
- Vibrio Science Day: Environmental Research. [Defining the environmental causes of Vibrio outbreaks](#). Prof Justin Seymore (University of Technology, Sydney). (July 2022)
- Vibrio Science Day: Environmental Research. [Phytoplankton microbiomes: a role in seafood safety and Vibrio outbreaks?](#) Associate Prof Chris Bolch (University of Tasmania) (July 2022).
- Vibrio Science Day: Post-harvest research. [The effect of storage temperature on the growth of *Vibrio parahaemolyticus*](#). Dr. Graham Fletcher (Plant and Food Research, New Zealand). (July 2022).
- Vibrio Science Day: Post-harvest research. [Market survey of *Vibrio* spp. In ready to eat seafoods available for sale in Melbourne, Victoria](#). Ms. Claire Hedges (NMI and RMIT University). (July 2022).
- Vibrio Science Day: Post-harvest research. [Utilising antimicrobial peptides as a treatment against *Vibrio* in bivalves](#). Mr. Justin McNab (Macquarie University, Sydney). (July 2022)
- Vibrio Science Day: Post-harvest research. [De-risking *Vibrio* for human health](#). Prof Karen Gibb (Charles Darwin University). (July 2022).
- Vibrio Science Day: Where to next? [The SA outbreak – challenges and opportunities](#). Mr. Paul Dowsett (PIRSA biosecurity). (July 2022).
- Vibrio Science Day: Where to next? [Vibrio in New Zealand: experiences and direction](#). Mr Piers Harrison (NZ Ministry for Primary Industries). (July 2022).
- Vibrio Science Day: [Panel Discussion](#). Dr. Andrew Keller (FSANZ), Prof. Karen Gibb (CDU), Dr. Valeria Torok (SARDI), Mr Anthony Zammit (NSW DPI), Mr. Piers Harrison (NZ MPI), Mr. Josh Poke (Tasmanian Oyster Co.). (July 2022).
- Contaminants in Seafood workshop (2023) Stakeholder workshop held in Melbourne. (October 2023). Confidential workshop report included as attachment to final report.
- [Microplastics in Seafood](#). (2024) Prof. Bronwyn Gillanders (University of Adelaide), Ms. Esther Garrido-Gamarro (FAO), Mr. Erik Poole (Sydney Fish Markets). (May 2024).
- Vibrio Science Day (2025 – not recorded). University of Tasmania, Rozelle Campus, Glover Street Lilyfield, NSW 2040.

Website Content Developed

- [Codex](#) (2025) Redevelopment of content to update and make more user friendly. Links to current issues, Codex committees and delegate reports at Codex meetings.
- [Contaminants in Seafood](#) (2025) Landing page of technical information – includes reports from project and information for stakeholders.
- [Risk Register](#): (2021) Landing page of technical information - includes national validation and sector specific resources.
- [Students](#) (2022) Overview of SafeFish student positions.
- [Vibrios in seafood](#) (2023) Landing page of technical information and resources – includes links to webinar/workshop, fact sheets, current activities and useful resources for industry.
- [Listeria monocytogenes and ready to eat seafood](#) (2024) Landing page of technical information and resources – includes technical reports, fact sheets, current activities and useful resources.
- [Ciguatera](#) (2023) Landing page of technical information and resources – includes links to FAQ, fact sheet, national ciguatera research strategy and activities
- [Call for ICMSS Hosts \(2024\)](#) Content developed to seek applications to host upcoming ICMSS.

- [Training](#) (2024) Landing page of training courses on shellfish safety.
- [Webinars](#) (2024) Landing page of recorded webinars freely available to view by stakeholders.

Appendix 1: SafeFish Chair Report 2021-2025

As the SafeFish Project 2021-25 concludes, it is timely to reflect on the achievements and issues that have arisen during the project period and insights that may influence the approach and focus of the project in 2025-30.

The operating environment in which seafood is marketed and consumed both domestically and internationally has changed significantly and was evident during the 2021-25 project period, resulting in changing food safety and market access risks. Consumer preferences have moved to short shelf life ready to eat products that may be purchased from traditional retail outlets or ordered online and delivered directly to households. New classes of products are also being developed, such as aquatic plants (e.g. seaweed) and detection technologies now quantify very low levels of chemical contaminants which can, and do, challenge Australia's ability to demonstrate the chemical safety of its seafood products. Changing climatic parameters, have led to different pathogen risks in some seafood, a notable example being impact of the bacteria *Vibrio*. In response, Safe Fish's activities continue to evolve and adapt to address these changing risks, contributing to Australian produced seafood maintaining a fundamental criterion for market success - its reputation as a safe food product for consumers.

The approach and outcomes of the 2021-25 project have been notable for the strategic shifts in how SafeFish delivers its goals:

- a heightened and forward focus on determining risks faced by the national seafood industry and specific sectors through developing risk registers and identifying appropriate risk management approaches which collectively strengthen industry preparedness
- Introduction of a more programmatic approach to activities facilitated by the extended funding cycle to 4 years, allowing a more comprehensive approach to tackling complex and multifaceted issues
- collaboration with health authorities to link pathogens detected in the environmental with resultant health impacts, allowing refinement of the risk management measures required in some circumstances
- expanding the scope of building capability to post graduate students who are well placed to deliver concrete research outcomes as well as develop their own skills.

A central tenet of SafeFish' operating model is the comprehensive involvement of the government, industry and researcher partners and other stakeholders in the development and implementation of the work program. SafeFish has continued to strengthen its links including with recreational fishers and organisations communicating directly with consumers, and researchers with related research interests and expertise. This has expanded the reach and sphere of influence of SafeFish, implementing one of the recommendations from the previous Chair, Dr Anne Astin.

As SafeFish develops its approach and work program for the 2025-30 Project, I recommend:

1. Continuation of the programmatic approach

The 5-year funding cycle provides a further opportunity for comprehensively address complex issues, including risk management measures, diagnostic tools and capable personnel, as well as undertaking the research to address gaps in our evidence base. With its stronger, enhanced linkages with key organisations and experts in both Australia and New Zealand (and increasingly international), SafeFish is well placed to play its role in addressing seafood safety issues.

2. Strengthen succession planning

The SafeFish project has been very capably and successfully implemented by a dedicated team lead by the project manager Dr Alison Turnbull and supported by project's executive officer,

Natalie Dowsett, and the project's researchers at South Australian Research and Development Institute and University of Tasmania. At some point these long serving and critical individuals will move to different roles or positions and the SafeFish project should take steps to facilitate a transition through developing leadership and technical skills.

3. Build capability to support the safety of Australian seafood

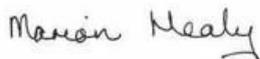
The individual projects undertaken by SafeFish all contribute to maintaining and strengthening the safety of Australian seafood. However, the risks are changing (such as climatic parameters), and Australia's approach must also continue to adapt and evolve in areas such as diagnostic tools, expertise of personnel, collaborations (including with public health agencies and relevant groups in New Zealand) and agreement on the risks and their mitigation approaches. Collectively, this approach further builds industry and government preparedness to respond to risks that emerge.

4. Influence national regulatory requirements and international standards and guidance

A key SafeFish function is the identification of national and international regulatory issues and providing technical input to national regulatory proposals and supporting Australia's international negotiating position. This function is critical to supporting trade that is science and evidence based and takes account of the Australian situation. The opportunity to work with New Zealand on influencing the international trading environment will also continue to be fruitful and should be supported.

Finally, a key feature of the SafeFish project is the high degree of cooperation and collaboration between researchers, industry and government and the high level of support for the SafeFish project. Many individuals and organisations work with, and support SafeFish, and give their time generously. The SafeFish model provides a highly effective mechanism for developing feasible risk management measures, dissemination of information about risks and their management, tools and resources and training opportunities. The direct and ongoing engagement with the stakeholder groups also provides a mechanism for implementation of proposed solutions, thereby delivering impactful outcomes in the short and long term. This is a key feature of SafeFish' success and I encourage its continuation.

Dr Marion Healy PSM



Independent Chair, SafeFish

Appendix 2: Project Staff and Researchers

SafeFish Secretariat Staff

- Independent Chair – Dr. Marion Healy PSM (contracted from 2021-2025 and retained on a stipend)
- Program Manager – Dr. Alison Turnbull (University of Tasmania)
- Executive Officer – Ms. Natalie Dowsett (SARDI Food Sciences)
- Codex Facilitator – Dr. Stephen Pahl (SARDI Food Sciences)
- Administrative Support Officer/Researcher – Ms. Navreet Malhi (SARDI Food Sciences)
- Researcher – Dr. Andreas Seger (University of Tasmania)
- Researcher – Ms. Claire Hedges (University of Tasmania)

Industry Funding Stakeholders

- Abalone Council of Australia Ltd.
- Australian Abalone Growers Association
- Australian Council of Prawn Fishers
- Australian Mussel Industry Association
- Australian Prawn Farmers Association
- Fisheries Research & Development Corporation
- Oysters Australia
- Pearl Oyster Consortium
- Salmon Tasmania
- Southern Ocean Fisheries
- Southern Rock lobster
- Sydney Fish Market
- Western Rock Lobster

SafeFish Partnership Members

- Dr. Marion Healy (Independent Chairperson)
- Dr. Alison Turnbull (UTAS)
- Dr. Stephen Pahl (SARDI)
- Mr. Mark Phythian and Mr. Andrew Keller (Food Standards Australia New Zealand FSANZ)
- Mr. Derrick Addison (Food and Beverage Importers Association FBIA)
- Mr. Erik Poole and Ms. Cristina Wong (Sydney Fish Markets)
- Ms. Amber Wood and Ms. Teagan McPadden (Department of Agriculture, Fisheries and Forestry DAFF Food and Organics Branch)
- Ms. Shelly Alderman (DAFF Export Standards Branch)
- Ms. Veronica Papacosta and Ms Julie Petty (Seafood Industry Australia)
- Ms. Jayne Gallagher and Mr. Andrew Robertson (Seafood Trade Advisory Group)
- Ms. Cathy Webb (Seafood New Zealand)
- Dr. Patrick Hone and Ms. Adrienne Laird (FRDC)
- Ms. Cindy Pickard (Simplot Australia – Processing industry representative)
- Mr. Clinton Wilkinson and Mr. Mark Boulter (Australian Shellfish Quality Assurance Advisory Committee)
- Mr. Russel Conway (Recreational Fishers Association)
- Australian Sustainable Seaweed Alliance (ASSA)
- Food Safety Information Council (FSIC)

SafeFish Contractors

The following contractors were engaged to assist with preparing technical research, act as technical experts, to facilitate technical workshops, and/or to assist with developing SafeFish communication outputs/materials.

- Dr. Marion Healy PSM (contracted as Independent Chair 2021-2025)
- Dr. Cristina Lesseur (contracted to facilitate the SafeFish Risk Register project 2021-2025)
- Mr. Mark Boulter (contracted to facilitate the UTAS shellfish safety training package 2024-2025)
- Mr. Bruno Carrocci of Arris Pty Ltd. (contracted to design, print and bind the 2021/22; 2022/23; 2023/24 SafeFish Annual reports)
- Ms. Belinda Cay of Ag Communicators Pty Ltd. (contracted to provide chairperson services for the SafeFish prioritisation workshop 2022)
- Dr. Tim Harwood of Cawthron Institute (contracted as an international technical expert at the SafeFish Contaminants in Seafood workshop 2023)
- Mr. Romano Studer of Zitrone (contracted to provide website design services and technical support for the SafeFish website 2023-2025).
- Ms. Katherine Ollerhead UTAS PhD Candidate (contracted to assist with data collation for the Contaminants in Seafood workshop report 2023).
- Ms. Clare Winkel of Integrity Compliance (contracted to deliver food recall workshops 2024).
- Dr. Sarah Ugalde of the University of Tasmania (employed to facilitate the food recall workshops 2024)
- Dr. Stephen Rust of the University of Tasmania (employed to conduct an economic assessment of the second *V. parahaemolyticus* outbreak in 2021 associated with South Australian Oysters 2024)
- Drs Anders Magnusson and Lisa Carlin BDO subcontracted to assist in the economic assessment of the second *V. parahaemolyticus* outbreak in 2021 associated with South Australian Oysters 2024)
- Dr. Jake Lacey of the Medical Diagnostic Unit subcontracted as a bioinformatician for the national *V. parahaemolyticus* study (2024-2025)
- Ms. Cath Robinson contracted for graphics art for the Risk Register
- Mr. James Brady, summer student at the University of Tasmania working on marine biotoxins from *Alexandrium spp.* and *Gymnodinium spp.*

SafeFish Workshops and Steering Groups

Workshops and steering groups to extend research outputs were facilitated and involved stakeholders are show below:

Prioritisation Workshop (July 2022)

- Belinda Cay - (Independent facilitator) AgCommunicators Pty. Ltd.
- Alison Turnbull - (Program Manager) SafeFish/UTAS
- Marion Healy - (Chair) SafeFish
- Tom Cosentino - Southern Rocklobster Limited
- Stephen Pahl - SafeFish/SARDI
- Len Stephens - Oysters Australia Chair
- Cathy Webb - Seafood New Zealand
- Clinton Wilkinson – ASQAAC
- Jayne Gallagher - STAG
- Cristina Lesseur - CL Advisory Pty Ltd
- Patrick Hone - FRDC
- Cindy Pickard - Simplot Australia

- Natalie Dowsett - (Executive Officer) SafeFish/SARDI (observer)
- Navreet Malhi - SafeFish/SARDI (observer)

Vibrio Science Day (October 2022)

- Natalie Dowsett
- Valeria Torok
- Justin Seymour
- Mark Boulter
- Graham Fletcher
- Alison Turnbull
- Andrew Keller
- Anna Padovan
- Stephanie Neal
- Karen Gibb
- James Thach
- Matt Osborne
- Rachel Brown
- Edward Forbes
- Amita Bernardi
- Stephen Pahl
- Shaye Carman
- Kyle Hodson
- Claire Hedges
- Anthony Zammit
- Lynlee Lowe
- Paul Dowsett
- Joshua Poke
- Khandaker Rayhan Mahbub
- Prue Bramwell
- Clinton Wilkinson
- Shane Buckley
- Ricky Partelle
- Christopher Bolch
- Gary Zippel
- Glen Scrymgour
- Navreet Malhi
- Steph Flemming
- Maria Saarela
- Tachakkeytap Lee
- Dorothy-Jean McCoubrey
- Lisa Olsen
- Josh Rajkumar
- Surinder Singh Aietan
- Alessia Centofanti
- Nicola King
- Piers Harrison
- Lucia Rivas
- Scott Whiddon
- Tracey Stamp
- Henry Tan
- Benjamin Witham
- Stewart Quinn
- Stuart Hellenen
- Mitchell Ranger
- Hollie Zimmermann
- Olivia White
- Paul Grey
- Jackie Wright
- Tim Harwood
- Shevaun Paine
- Jing Wang
- Andy Myers
- Maddy Petrusic
- Marion Healy
- Mike Williams
- Andrew Bridle
- Ben Daughtry
- Barbara Butow
- Emily Fearnley
- Michael Addidle
- Tyron looker
- Anne-Marie Perchec-Merien
- Stephen Olsen
- Sarah Spurling
- James Wynne
- Hazel Farrell
- Carolyn Stewardson
- Wayne O'Connor
- Kirsty Smith

Contaminants in Seafood Workshop (October 2023)

- Alice Cheung-Stedman - DAFF Dairy, Eggs and Fish Export Program
- Alison Turnbull - SafeFish/The University of Tasmania
- Andy Somers - NRS Seafood Program
- Belinda Ly - Woolworths
- Cathy Beale - Woolworths
- Cathy Webb - Seafood New Zealand
- Cindy Pickard - Simplot Australia
- Claire Hedges - SafeFish/The University of Tasmania
- Cristina Lesseur - CL Advisory Consultants
- Edward Forbes - Tasmanian ShellMAP
- Ewan Blanch - RMIT University - Chemistry Department
- Jayne Gallagher - Seafood Trade Advisory Group (STAG)
- Jeevan Khurana - DAFF Export Standards Branch, Exports and Veterinary Sciences Division
- Jo Kielczewska - Coles Supermarkets
- John Mercer - Victorian Fisheries Authority
- Justyna Garbowska - National Measurement Institute
- Karl Krause - Tasmanian Rock Lobster Fishers Association
- Kathryn Hassell - RMIT University
- Kirsten Benkendorff - Southern Cross University
- Kylie Cahill - Tasmanian Rock Lobster Fishers Association
- Leah Williamson - Coles Supermarkets
- Mark Boulter - Food and Beverage Importers Association (FBIA)/Consultant
- Matt Taylor - NSW Department of Primary Industries - Recreational Fisheries Research
- Matt Wasnig - Seafood Industry Victoria
- Matt Taylor - Western Rock Lobster
- Matt Jones - FRDC Extension Officer Victoria
- Natalie Dowsett - SafeFish/The South Australian Research & Development Institute (SARDI)
- Natasha Yang - DAFF Imported Food Section - Residues and Food Branch
- Peter Torley - RMIT University - Food Safety Department
- Rachel King - Australian Council of Prawn Fisheries (ACPF)
- Roy Palmer - Association of International Seafood Professionals
- Sarah Spurling - Primary Industries & Regions SA (PIRSA) Biosecurity
- Shelly Alderman - DAFF Dairy, Eggs and Fish Export Program
- Stacey Yong - RMIT Food Safety Department
- Stephen Pahl - SafeFish/The South Australian Research & Development Institute (SARDI)
- Tim Harwood - Cawthron Institute
- Tyrone Looker - Primary Industries & Regions SA (PIRSA) Biosecurity

Contaminants in Seafood Project – Selection Committee Members for External Consultant

- Alison Turnbull (UTAS/SafeFish)
- Natalie Dowsett (SARDI/SafeFish)
- Justyna Garbowska (National Measurement Institute)
- Cathy Webb (Seafood New Zealand)

Risk Register Steering Group (2021-2025)

- Natalie Dowsett (SARDI/SafeFish)
- Cristina Lesseur (Independent Consultant)
- Alison Turnbull (UTAS/SafeFish)

- Erik Poole (Sydney Fish Market)
- Andrew Keller (FSANZ)
- Veronica Papacosta (Seafood Industry Australia)
- Mark Boulter (SIAA)
- Carolyn Stewardson (FRDC)

National Risk Register

- 36 Survey Respondents 2021/22
- 9 participants in the brainstorming exercise 2021/22
- 3 experts interviewed 2021/22
- 22 survey respondents 2024
- 3 in-depth interviews 2024

Bivalve Risk Register

- 21 participants

Prawn Risk Register

- 36 participants

Risk Register Vibrio Road Map Working Group

- Shaye Carman - Department of Primary Industries, WA
- Lynlee Lowe - Oysters SA
- Tracey Stamp - Health WA
- Valeria Torok - PIRSA/SARDI, SA
- Karen Gibb - Charles Darwin University, NT
- Steven Gill - Maxima Oysters, WA
- Robin Sherlock - SafeFood, Queensland
- Anthony Zammit - Department of Primary Industries, Food Authority, NSW
- Clinton Wilkinson - PIRSA/ ASQAP, SA
- Karen Loone - Department of Natural resources and environment (NRET), TAS
- Mark Phythian - Food standards Australia-NZ, Canberra
- Stephen Pahl - PIRSA/SARDI, SA
- Claire Hedges - University of Tasmania, TAS
- Phil Baker - Department of Primary Industries, Food Authority, NSW
- Melanie Stock - Aquaculture council, WA
- Kyle Hodson - Harvest Road, WA
- Alison Turnbull - University of Tasmania, TAS

PhD Candidate Selection Committees (3) Members

- Carolyn Stewardson (FRDC)
- Andrew Keller (FSANZ)
- Alison Turnbull (UTAS)
- Jayne Gallagher (STAG)
- Mark Phythian (FSANZ)
- Adrienne Laird (FRDC)

Recall Workshop Steering Committee

- July Petty (SIA)
- Adelle Yates (FSANZ)
- Matt Jones (FRDC)

- Karen Loone (NRET)
- Alison Turnbull (UTAS)
- Sarah Ugalde (UTAS)

Recall Workshop (Tasmania) June 2024

- Deborah Gardner (Mabrun Oysters)
- Gus Yearsley
- Joe Jacobson (Little Swanport Oysters)
- Bob Lister (Tasmanian Scallop Fisherman's Association)
- Casey Garrett (Camerons Oysters)
- Celia Milne (Australian Longline)
- Anthony Woollams (Tasmanian Oyster Co)
- Pranav Maharaj (Tasmanian Oyster Co)
- Mat Conboy
- Mark Fleming (Tasmanian Seafoods)
- James Valentine (Tasmanian Health)
- David Baresford (Mures)
- Hayden Dyke
- Simon Leonard (Hailong seafood)
- Sarah Ryan (Petuna)
- Julian Harrington (Guest presenter)
- Karen Loone (DNRE Tasmania)

Recall Workshop (South Australia) June 2024

- Kylie Petherick (Stehr Group)
- Sara Hetzel (Hetzl Oysters)
- Nathalie Binder (Wild West Oysters)
- Stacey Fallon (Angel Seafood)
- Sandra Harder (Port Lincoln Seafood)
- Glyn Owen

Recall Workshop Virtual Session 1 November 2024

- Sandra Harder (Port Lincoln Seafood)
- Jo Pocock (Smoky Bay Oysters)
- Mark Boulter (Safe sustainable seafood)
- James Thach (SA Government)
- Stacey Fallon (Angel Seafood)
- Lynlee Lowe (SAOGA)
- Sinead Ivory (Austral Fisheries)
- Gabriel Santos (Angel Seafoods)
- Bastien Finet (Angel Seafoods)
- Jessica McInerney (Petuna)
- Anthony Tennant (Southern Fish Marine)
- Maurie Mezzino (SD Caputo and Sons)
- Felipe Henriquez (SafeFish student)

Recall Workshop Virtual Session 2 November 2024

- Tracy Pertzelt (Pristine oysters)
- Sarah Spurling (SA Government)
- Susannah Roelofsz

- Celeste Boonaerts
- Ravishankar Kumaresan
- Roy Palmer (Consultant)
- Christina Francis
- Amanda Athis (Tafe NSW)
- Andy Myers (NSW Oyster Farmers)
- Santha Nakandage (HD Barra)
- Shandy Yap (Main Aqua)
- Kylie Henrickson (Main Aqua)
- Meaghan Dodd (Intuitive Food Solutions)
- Yuliana Valencia (Fish Factory)
- Antony Libin

Vibrio Science Day May 2025 (in-person and on-line attendees)

- Ghazal Akhtar (Coles Group)
- Gousia Ain Alira Abdul
- Cynthia Alvarez Ruiz
- Zoe Baldwin (NSW Health)
- Celeste Boonaerts
- Mark Boulter (UTAS)
- Ilana Cox
- Felicia Eboka
- Hazel Farrel (NSW Food Authority)
- Scott Favacho (Department of Health, WA)
- Emily Fearnley (SA Health)
- Graham Fletcher (Plant and Food Research NZ)
- Edward Forbes (NRE Tasmania)
- Karen Gibb (CDU)
- Caroline Gilbertson
- Paul Grey (Department of Health, Tasmania)
- Claire Hedges (UTAS)
- Kyle Hodson (Harvest Road Group)
- Kirsty Hope (NSW Health)
- Cheryl Jenkins (DPI NSW)
- Jake Lacey (MDU, Peter Doherty Institute)
- Lex Leong (SA Health)
- Karen Loone (NRE Tasmania)
- Laura Lopez (NSW Health)
- Patrick Peacock (Interim Australian Centre for Disease Control)
- Maddy Petrusic (Swinburne University of Technology)
- Lucia Rivas (ESR Surveillance, NZ)
- Justin Seymour (University of Technology, Sydney)
- Craig Shadbolt (DPI NSW)
- Eby Sim (University of Sydney)
- Vitali Sintchenko (NSW Health)
- Sarah Spurling (SA Health)
- Basel Suliman (NSW Health)
- Carl Suster (NSW Health)
- Valeria Torok (SARDI)
- Alison Turnbull (SafeFish/UTAS)
- Sinisa Vidovic (Plant and Food Research NZ)
- Qinning Wang (NSW Health)
- Anne Watt (NSW Health)
- Jacqueline (Jackie) Wright (ESR Surveillance, NZ)
- Anthony Zammit (DPI NSW)
- Roger Barnard (DPIRD, WA)
- Alessia Centofanti (SA Health)
- Stephanie Fleming (SafeFood Qld)
- Drew Grosser (SA Health)
- Piers Harrison (MPI NZ)
- Lotus Hassan (DPIRD, WA)
- Marion Healy (SafeFish)
- Sara Hetzel
- Laura Lopez
- Lynlee Lowe (Oysters SA)
- Dorothy-Jean McCoubrey
- Esther Onyango
- Stephen Pahl (SARDI)
- Anne-Marie Perchec (MPI NZ)
- Tracey Stamp (WA Health)
- Scott Whiddon (DPIRD, WA)
- Mike Williams (UTAS)
- Stacey Yong (RMIT University)
- Gary Zippel (SAOGA)

Vibrio – Bioinformatics Workshop 2025

- Ella Burgun (UTAS)
- Robin Cappaert (UTAS)
- Alexander Coutts (UTAS)
- Madeline Green (UTAS)
- Claire Hedges (UTAS)
- Mengjia Jiang (UTAS)
- Jake Lacey (MDU)
- Rayhan Mahbub (SARDI)
- Ivona Mladineo (UTAS)
- Aditya Swami (UTAS)
- Valeria Torok (SARDI)
- Mike Williams (UTAS)

Vibrio – Whole Genome Sequence Information Review 2025

- Jake Lacey (MDU)
- Paul Grey (DHHS, Tas)
- Neil Franklin (NSW Health)
- Cheyl Jenkins (NSW DPI)
- Lex Leong (SA Pathology)
- Viatli Sintchenko (NSW Health)
- Valeria Torok (SARDI)
- Anne Watt (NSW Health)
- Claire Hedges (UTAS/SafeFish)
- Alison Turnbull (UTAS/SafeFish)

Appendix 3: Prioritisation Process

The generation of the SafeFish work program includes a systematic approach to capturing and identifying issues (existing and emerging), prioritising the issues, and undertaking technical work to provide potential solutions to overcome technical barriers. The following sources of information and data are scrutinised by the Secretariat annually to identify emerging and existing issues that affect the Australian seafood industry:

- Recently published scientific and regulatory literature;
- Trade databases containing statistics on rejections/detentions of seafood from key trading partners;
- International human illness outbreaks related to seafood consumption;
- Advice from industry trade groups (e.g. Seafood Trade Advisory Group, FBIA, SIA etc.)
- Advice from industry and regulatory stakeholders;
- Advice from SafeFish partners/funders;
- Advice through Codex forum and new international seafood risk management policies.

Following this process, a list of issues is generated which is then filtered by the Secretariat and SafeFish partners to only include those that fall within the scope of the program (parameters used to determine this include: food safety related; cost to facilitate work; threats to trade; and remit of the SafeFish platform). The resulting list of issues is then included in the prioritisation process below.

A comprehensive prioritisation process to fully scope and rank the issues identified is coordinated by the Secretariat once every project term, this entails the following:

- Scoping each issue that has been identified. The scoping document includes a description of the issue, outlines who it affects, provides existing trade and market access data where available, and specifies the public health, economic, environmental, reputational and regulatory implications).
- A prioritisation workshop (facilitated by the independent consultant) involving key stakeholders (partnership members, technical & industry expert/(s), panel members and other relevant parties) is then held to rank the issues based on pre-set criteria. This determines the issues with the highest priorities that then form the technical work program for the next period.

Throughout the life of SafeFish, five full prioritisation processes have been facilitated (May 2011, June 2014, October 2016, July 2019 and June 2022).

Prioritisation Results 2022:

At the conclusion of the prioritisation assessments and following the discussions by the participants, the issues that were included on the SafeFish technical work program for 2021-2025 included:

1. The impacts from RTE seafood due to consumer change with a focus on *Listeria monocytogenes*
2. Chemical contaminants
3. *Vibrio* in seafood
4. Micro and nano plastics in seafood – watching brief
5. Ciguatera – progression of the health care workers survey and a continued watching brief in the space.

Climate change and Norovirus in seafood were not included as they do not fall within the remit of what SafeFish could address within the scope of the program. Fraud and authenticity were also removed as the trade and public health categories were not high (the ranking was attributed to the economic impacts the issue may have).

In the final session of the workshop, the participants discussed potential project ideas/research that could be undertaken for the issues. These were as follows:

Chemical contaminants

Partnering with the National Residue Survey, STAG, and SECC: SafeFish will need to work collaboratively in this space. A suggestion was to design an appropriate survey/sampling plan for contaminants to address the data gaps and to compliment what is supplied by NRS program for seafood. Focus efforts on all contaminants (including inorganic arsenic) and AgVet chemicals.

A project relating to AgVet chemicals should be more of a scanning/literature review. A review of what chemicals should be tested for in the NRS program is important including looking forward and forecasting chemicals of concern that may be emerging.

***Listeria monocytogenes* and RTE**

SafeFish can work in this space by conducting education and developing a navigation tool that demonstrates the regulations for industry around RTE, safe practices and management. The issues along the cold-chain may be difficult to investigate due to sensitives. Labelling for the final intended use of products is an area that education/training could be undertaken. Education/training for vulnerable populations to improve the understanding of the risks/potential illnesses that arise in this demographic could be valuable. SafeFish could also investigate the pathogenic side (whole genome sequencing) of *Listeria monocytogenes* to assist with establishments considering specific screening for *Listeria monocytogenes*. An emerging issue could include the phasing out/banning of plastic packaging and what impacts this could have on the food safety of seafood products in Australia. SafeFish could re-run workshops around packaging (including alternative packaging options and their impacts to seafood from food safety).

***Vibrio* in seafood**

A nation-wide action plan for vibrio would be an important first step. Identify who is doing what in the research space, what are the gaps for *vibrio* (this should be covered in the risk control plan that is being developed as part of the Risk Register project). The methodology for *vibrio* detection is a high priority (isolates, pathogenicity, methods of detections, dose/response (collaborate with NZ on this) a lot of these research gaps will be investigated by Karen Gibb (CDU) in her current research project.

General Comments:

There is a role for SafeFish to build capability within industry, research, and government. Food donation areas are a space that are highly unregulated. SafeFish will continue to work with Emily Ogier (FRDC Human Dimensions) to investigate the social aspect of ciguatera and other food safety issues to put a different lens on how we can have more impact.

Appendix 4: International Standard Development

Codex Technical Input

SafeFish monitors and has input into the review/development of several Codex Standards, Guidelines and Code of Practices of relevance to the Australian seafood industry. SafeFish aims to keep the relevant industry sectors informed of developments and helps to ensure that risk management approaches are commensurate to the level of risk within Australia. SafeFish monitors activities from the following Committees:

- Codex Committee on Contaminants in Foods (CCCF)
- Codex Committee on Food Additives (CCFA)
- Codex Committee on Food Hygiene (CCFH)
- Codex Committee on Fish and Fishery Products (CCFFP)
- Codex Committee on Fats and Oils (CCFO)
- Codex Committee on Methods of Analysis and Sampling (CCMAS)
- Codex Committee on Residues of Veterinary Drugs in Foods (CCRVDF)
- Codex Alimentarius Commission (CAC).

These Committees manage a wide variety of activities and whilst not all these activities are relevant to the seafood sector, resources are required to identify the items that are. Between July 2021 and April 2025 over 288 Codex related documents have been reviewed with 87 items of relevance to seafood.

To ensure that the Australian position on the Codex agenda addressed industry concerns, SafeFish followed a formalised process to provide technical briefs for issues that were of a potential concern to the Australian seafood industry. An overview of the technical input coordinated for specific Codex issues is detailed below.

Standard for Canned Sardines and Sardine-Type Products

In 2020, Codex received a proposal to amend the Codex *Standard for Canned Sardines and Sardine-Type Products* (CXS 94-1981) to include *Sardinella lemuru* (Scaly Mackerel; Bali sardinella) in the list of designated *Sardinella* species. CCFFP was subsequently reactivated to consider this proposal. SafeFish notified the Western Australian Fishing Industry Council and the South Australian Sardine Industry Association of the proposal and kept them informed of developments. SafeFish supported Australian delegations on an eWG (2021-2023), at the 35th Session of CCFFP (September/October 2021) and at the 36th Session of CCFFP (October 2024). A representative from Mendolia Seafoods also supported the Australian delegation on the eWG.

The amended standard was adopted by CAC in November 2024. Changes consisted of the inclusion of *S. lemuru*, editorial amendments to update scientific names (*Etrumeus sadina* (formerly known as *Etrumeus teres*); *Sardinops sagax* (*S. neopilchardus* and *S. caeruleus* belong to *S. sagax*); *Strangomera bentincki* (formerly known as *Clupea bentincki*)) and the inclusion of two other sardine-type species (*Sardinella fimbriata* and *Amblygaster sirm* (formerly known as *Sardinella sirm*)) previously approved but had been accidentally omitted from the Standard. The changes help eliminate international trade barriers and enhances the market access for *S. lemuru* and the other species that were updated.

Guidelines for the Control of Pathogenic *Vibrio* Species in Seafood

In December 2022, CCFH agreed to revise the existing *Guidelines on the Application of General Principles of Food Hygiene to the Control of Pathogenic Vibrio Species in Seafood* (CXG 73-2010). The existing Codex guideline was adopted in 2010, and new knowledge and scientific advice has

subsequently become available. SafeFish informed and requested comments from key *Vibrio* researchers in Australia on the need and pending scope of work.

SafeFish representatives were part of a Codex eWG and provided a submission to the Australian Codex delegation leads in February 2024 and worked to finalise Australia's position. SafeFish also supported the Australian delegation at the 54th Session of CCFH (March 2024), during which the revisions of the guidelines were progressed.

Key developments/changes from the previous version of the *Vibrio* control guidelines and any drafts that were in development included:

- Removal of “seaweed” from the definition of “seafood”. – The inclusion of seaweed had been proposed by another country during the revisions. The agreed definition of seafood was “Fish, shellfish and other aquatic invertebrates from marine and fresh water sources and their products which are intended for human consumption”.
- Revision of the definition of “partially treated” to re-enforce that a partial treatment will reduce or limit but not eliminate *Vibrio species* in seafood.
- Maintaining that a temperature of 10°C or lower is adequate to limit growth of pathogenic *Vibrio species*.
- Highlighting that the failure to detect virulent strains in the environment or in food does not mean there is no risk to consumers.
- Inclusion of a new section on the selection and application of methods for detection and enumeration of pathogenic *Vibrio species*. This section was divided into ‘purpose of analytical testing’, ‘choice of analytical method’ and ‘type of analytical methods’ to assist in comprehension.
- The statement around the majority of foodborne illness is caused by *V. parahaemolyticus*, choleraogenic *V. cholerae* (O1, O139), or *V. vulnificus* remains, however a list of other *Vibrio species* reported to cause foodborne illness was included as a footnote.

However, no consensus could be reached over the use of terms “clean water” or “water fit for purpose”. CCFH54 agreed to forward the proposed revisions to CAC for adoption as a draft text and agreed to revisit the guidelines and finalise references to water after completion a concurrent Codex document on *Guidelines for the Safe Use and Reuse of Water in Food Production and Processing* (CXG 100-2023).

The revision to the guideline helps to protect the health of the consumers and to highlight key control measures that can be used to minimise the likelihood of illness arising from the presence of pathogenic *Vibrio species* in seafood. These guidelines provide information that will be of interest to the food business operators, consumers, competent authorities and other interested parties.

Guidelines for the Safe Use and Reuse of Water in Food Production and Processing

In December 2022, CCFH developed a new *Guideline for the Safe Use and Reuse of Water in Food Production and Processing* (CXG 100-2023) by applying a ‘fit-for-purpose’ principle and using a risk-based approach for microbiological hazards (such as parasites, bacteria and viruses). The need for an evaluation of physical and chemical hazards in water were noted and included under the general principles but were out-of-scope in this particular guideline. Water can be a vector to transmit pathogens and other contaminants, and the use of potable water is often not a sustainable, feasible or practical solution. Other types of water could be fit for some purposes or made fit for use. Deciding on whether water is fit-for-purpose considers risks associated with the source water, treatment options and their efficacy, application of multiple barrier processes for risk mitigation and the end-use of the food product.

SafeFish reviewed the document and provided general comments to Codex Australia. SafeFish also supported the Australian delegation at 53rd Session of CCFH (Nov/Dec 2022). An Annex to this

document which will contain additional guidance specific to the seafood industry remains under development. SafeFish has supported the Australian delegation on an eWG and reviewed early draft versions of the Annex and provided feedback to Codex Australia in September 2023 and February 2024. SafeFish circulated a revised draft version of the Annex to key industry bodies and sector associations in February 2024. No feedback was received.

SafeFish supported the Australian delegation at the 54th Session of CCFH (March 2024). During this meeting CCFH made progress on developing the Annex for fish and fishery products but agreed that additional deliberations were needed to finalise the text. A separate draft Annex on water fit-for-purpose assessments, safety management and technologies for recovery and treatment of water and reuse was also discussed. SafeFish has continued to support the Australian delegation as these Annexes progress and provided additional comments on draft Annexes in September 2024 and April 2025.

The development of these guidelines will assist food businesses operators in determining controls and strategies within a risk-based framework to prevent the sourcing/use/reuse of unsafe water.

Guidelines on the Application of General Principles of Food Hygiene to the Control of Viruses in Food

Foodborne viruses are common in many parts of the world and can result in large outbreaks. In October 2022, SafeFish notified the chair of ASQACC and key foodborne virus researchers in Australia of Codex's plan to revise the existing *Guidelines on the Application of General Principles of Food Hygiene to the Control of Viruses in Food* (CXG 79-2012). In March 2024, CCFH formally agreed to revise the existing guidance. The scope of proposed changes includes revision of interventions along the food chain, and the provision of additional information on the testing of foods for foodborne viruses, and a consideration of new scientific findings for the control of norovirus in shellfish including indicators to monitor seawater quality of molluscs growing areas and risk assessment models. The updated guidance is expected to assist countries in adopting hygiene practices to reduce the risks of foodborne illness from viruses and to support international fair food trade practice. Amendments to the guideline could have implications on the ASQAP Manual. SafeFish will support the Australian delegation as the text is revised.

Guidelines on the Application of General Principles of Food Hygiene to the Control of *Listeria monocytogenes* in Foods

In December 2022, CCFH agreed to consider the possible revision of the *Guidelines on the Application of General Principles of Food Hygiene to the Control of Listeria monocytogenes in Foods* (CXG 61-2007). In March 2024, CCFH formally agreed to revise the existing guidance. The new work would consider control measures throughout the production-to-consumption chain, microbiological monitoring methods and consumer practices. This revision will be mainly based on the latest scientific advice from JEMRA. The updated guidance is expected to assist countries in the adoption of practices to reduce the risk of listeriosis and support international fair trade practices. SafeFish will support the Australian delegation to provide feedback as the text is revised.

Code of Practice for the Prevention and Reduction of Ciguatera Poisoning

Ciguatera poisoning has become a global health issue and is increasing in prevalence due to factors that include climate change. Coastal communities that rely on local fishing as a food supply and as a source of income are particularly at risk from increasing occurrences of ciguatera poisoning. In May 2022, CCCF agreed to establish an eWG chaired by the United States of America and co-chaired by the European Union (EU) to prepare a discussion paper on the development of a Code of Practice or Guidelines to prevent or avoid ciguatera poisoning. In February 2023, CCCF released the discussion paper that proposed to develop a Code of Practice for the prevention or reduction of ciguatera poisoning. SafeFish circulated the discussion paper to key stakeholders and provided a submission to Codex Australia in March 2023. In April 2023, CCCF agreed to start new work on developing a Code of

Practice/guideline for the prevention or reduction of ciguatera poisoning. SafeFish participated in a Codex eWG and engaged with relevant Australian industry bodies, researchers, and regulators as the Code of Practice was developed. SafeFish provided submissions to the Australian delegation in November 2023, January 2024, March 2024 and April 2024. SafeFish also supported Mr Damian Farrington (Queensland Health) to attend the 17th Session of CCCF (April 2024). The suggested changes to the draft documents provided by SafeFish were generally accepted. However, at the CCCF meeting, the committee decided to retain the 2020 FAO/WHO list of marine organisms known or suspected to be associated with ciguatera poisoning but to emphasize that the list is not exhaustive and only provides examples of the variety of organisms and regions that may be associated with ciguatera poisoning. Pertinent changes that SafeFish advocated for was to ensure that:

- the text included the importance of accurate epidemiological data for successful surveillance and monitoring of ciguatoxins;
- competent authorities had the flexibility to consider development ML when there was sufficient data linking epidemiology and toxicology;
- where possible, laboratories should consider storing aliquots of CTX-contaminated fish or algae;
- the text addressed the practicalities on sampling and limitations on analytical methods and facilities.

In April 2024 CCCF finalised the *Code of Practice for the Prevention or Reduction of Ciguatera Poisoning* (CXC 83-2024) which was subsequently adopted by CAC in November 2024. The Code of Practice provides guidance on recommended practices to prevent or reduce ciguatera poisoning for different types of stakeholders including competent authorities, fish sector operators (fishers, seafood processors, and seafood retail workers), health care professionals, and consumers. Because of differences in ciguatoxins, analytical methods and standards, and regional prevalence levels of ciguatera poisoning, not all recommended practices will be applicable in all situations or to all stakeholders. CCCF also produced an information document on resources for ciguatera poisoning monitoring and training.

Maximum levels for methylmercury in Fish and Sampling Plans

In March 2022, SafeFish reviewed an eWG discussion paper on establishing MLs for methylmercury in fish (Pink Cusk-Eels and Orange Roughy), and the development of sampling plans and risk management measures. Maximum levels were set based on the ALARA (as low as reasonably achievable) principle. SafeFish continued to advocate that prior to any MLs being established the contaminant needs to be present in amounts that are significant for total exposure and that sampling plans, if developed, should be practical and feasible whilst ensuring food safety using a risk-benefit based approach. The discussion paper raised the possibility of ceasing the development of a ML for methylmercury for Patagonian Toothfish due to the lack of sufficient data. SafeFish notified key industry representatives of development and seeking if they held additional methylmercury data for Patagonian Toothfish or could advise on any forward sampling plans. Australian Longline and Austral were engaged in the process, both having previously provided methylmercury and/or total mercury contamination levels to the international GEMS/Food database. Australian Longline had plans for additional sampling in 2022. SafeFish informed the Australian Delegation leader that there were industry plans for the analysis of methylmercury/mercury levels in Patagonian Toothfish samples. The 15th Session of CCCF (May 2022) agreed to abandon work on establishing a ML for methylmercury in Patagonian Toothfish due to lack of sufficient data, but noted that an ML for this species could be considered in the future when sufficient data became available and that any members could make a proposal for new work in the future.

In March 2024 SafeFish circulated the proposed sampling plans to key industry representatives. No concerns were raised by industry. In April 2024, CCCF agreed to forward the sampling plans to CCMAS for endorsement and CAC for adoption. CAC adopted the sampling plans in November 2024. During deliberations CCCF noted that it was important to gain experience on using the sampling plans and that

if the sampling plans were not practical then CCCF could come back with a revision/amendment. The sampling plan provides a procedure for sampling from a lot, with a view to ensure that the collected sample is a representative sample. The lot is then accepted if the test result is less than the Codex ML.

The establishment of MLs and the associated sampling plans help to ensure food does not contain elevated levels of methylmercury that could threaten human health.

Recommended Methods of Analysis and Sampling

CCMAS had instigated a process to review the *Recommended Methods of Analysis and Sampling* (CXS 234-1999) to remove inconsistencies, make editorial corrections and check if the methods listed were still fit for purpose. As part of this process all methods previously listed in CCFFP Standards will be moved into the CXS 234-1999. CCMAS also agreed to remove any methods for which there were no provisions in corresponding fish and fishery products standards, or for which method performance criteria had been developed (as these criteria include examples of methods that meet the performance criteria).

SafeFish reviewed and provided comments on the proposed revisions to the Australian delegation lead in October 2023 and April 2024. In May 2024 CCMAS completed the review and agreed to forward the methods of analysis to the CAC for adoption. CAC adopted the revision in November 2024. This provides a single source for recommended methods of analysis and sampling, reduces duplication and inconsistencies.

Code of Practice for the Prevention and Reduction of Cadmium Contamination in Foods

In 2021 JECFA conducted a dietary exposure assessment of cadmium and concluded that the major contributors to dietary cadmium exposure were cereals and cereal products, vegetables and seafood.

In February 2024, the CCCF released a discussion paper that proposed to develop a Code of Practice for the prevention and reduction of cadmium contamination in foods. SafeFish circulated the discussion paper to key stakeholders for comment. Feedback was obtained from the ASQAAC Cadmium working group. In April 2024, CCCF agreed to establish the Code of Practice. SafeFish supported the Australian delegation on a Codex eWG (2024/25) and provided comments on the first and second draft documents in November 2024 and February 2025.

Pertinent comments included a need to focus on health impacts from dietary exposure to cadmium (rather than other exposure mechanisms), anthropogenic actions that may led to elevated cadmium in the soil, a rebuttal on a suggestion that it may be possible to select seaweed species with lower cadmium levels for processing and consumption, as it is recognized that the some seaweed species with lower cadmium levels may not be suitable for a particular application.

Once adopted the Code of Practice will help reduce exposure to cadmium from foods. Dietary cadmium exposure is primarily associated with adverse effects on kidneys and bones.

Fish oil standard - Inclusion of Calanus oil

In October 2021 CCFO received a proposal to consider the inclusion of Calanus oil (derived from *Calanus finmarchicus*) as a named fish oil in *Standard for Fish Oils* (CXS 329-2017). Calanus oil is different from most other fish oils as the main lipid class is wax ester. *C. finmarchicus* is most commonly found in the North Atlantic. SafeFish provided updates on the website. In February 2024 CCFO agreed to include Calanus oil in CXS 329-2017 and forwarded the revision to CAC for adoption. The essential composition and quality factors for Calanus oil include ranges of fatty acid composition and wax esters of at least 80% w/w (weight per weight). Given concerns from a Member Organisation on the safe levels of intake of astaxanthin the Standard will also specify that the maximum levels of astaxanthin shall comply with the regulations of the country of retail sale. CAC adopted the revisions in November 2024.

The inclusion of Calanus oil in CXS 329-2017 aims to reduce trade impediments and help governments in assessing the quality and the barriers and/or rejection of the product at the trade borders, and help manufacturers and traders documenting product authenticity and traceability.

Diflubenzuron MRL in salmon

In July 2021 CCRVDF agreed to forward a proposed MRL for diflubenzuron (an insecticide) in salmon of 10µg/kg in muscle plus skin in natural proportions for adoption. CAC adopted the MRL in December 2021. SafeFish provided updates on the website. FSANZ currently has a temporary MRL for diflubenzuron in fish muscle of 2µg/kg.

Extrapolation of deltamethrin MRL in finfish

In December 2021 CCRVDF proposed to extrapolate the MRL for deltamethrin (an insecticide) in salmon muscle to muscle of all finfish at 30µg/kg. In January 2022 SafeFish notified the Executive Officers of aquaculture sectors, aquatic veterinarians and major aquaculture feed companies of the proposal. CCRVDF agreed to the extrapolation in February 2023, which was adopted by CAC in November 2023. SafeFish provided updates on the website. There is no MRL for deltamethrin in fish or fishery products in the FSC.

Extrapolation of flumequine MRL in finfish

In December 2021 CCRVDF proposed to extrapolate the MRL for flumequine (an antibiotic) in trout muscle to muscle of all finfish at 500µg/kg. In January 2022 SafeFish notified the Executive Officers of aquaculture sectors, aquatic veterinarians and major aquaculture feed companies of the proposal. CCRVDF agreed to the extrapolation in February 2023, which was adopted by CAC in November 2023. SafeFish provided updates on the website. Flumequine is not permitted for use on food-producing animals in Australia and there is no MRL for flumequines in the FSC.

Extrapolation of lufenuron MRL in finfish

In October 2024 CCRVDF agreed to a proposal to extrapolate a MRL of 1,350 µg/kg of lufenuron (an insecticide) in fillet (muscle plus skin in natural proportions) of salmon and trout to fillet (muscle plus skin in natural proportions) of all finfish. This proposal was adopted by CAC in November 2024. SafeFish provided updates on the website. There is no MRL for lufenuron in fish or fishery products in the FSC.

Extrapolation of emamectin benzoate MRL in finfish

In October 2024 CCRVDF agreed to a proposal to extrapolate a MRL of 100 µg/kg of emamectin benzoate (an insecticide) in fillet (muscle plus skin in natural proportions) and muscle of salmon and trout to fillet (muscle plus skin in natural proportions) of all finfish. This proposal was adopted by CAC in November 2024. SafeFish provided updates on the website. There is no MRL for emamectin benzoate in fish or fishery products in the FSC.

Imidacloprid MRL in fish.

In March 2024, JECFA completed the safety evaluation of imidacloprid (neonicotinoid parasiticide) and recommended an MRL for Atlantic salmon and rainbow trout fillet (muscle with skin in natural proportions) and/or muscle of 600 µg/kg. It further recommended that the MRL be extrapolated to all finfish. In October 2024 CCRVDF agreed to the recommendations and extrapolated the MRL to the fillet (muscle with skin in natural proportions) and/or muscle of all finfish. This proposal was adopted by CAC in November 2024. SafeFish provided updates on the website. There is no MRL for imidacloprid in fish or fishery products in the FSC.

Fumagillin MRL in fish

In March 2024, JECFA completed the safety evaluation of fumagillin (antimicrobial agent) and recommended an MRL of 10 µg/kg in fish fillet. In October 2024 CCRVDF agreed to the recommendations which was subsequently adopted by CAC in November 2024. SafeFish provided updates on the website. There is no MRL for fumagillin in fish or fishery products in the FSC.

Unintended and unavoidable carryover of veterinary drugs

In February 2023, CCRVDF agreed to establish an eWG that will be chaired by Australia and co-chaired by Canada to further develop a discussion paper on the criteria and procedures for the establishment of action levels for unintended and unavoidable carryover of veterinary drugs from feed to food of animal origin. In October 2024 CCRVDF agreed to modify the Codex Procedural Manual and include a new section in the Risk Analysis Principles applied by CCRVDF (Annex D: Criteria and procedures for the establishment of action levels for residues of veterinary drugs in food of animal origin resulting from the unavoidable and unintentional veterinary drug carryover in non-target animal feed). CCRVDF continue to work on developing guidance for competent authorities on what actions may be considered where residues of a veterinary drug are detected in a food from a non-target animal associated with unavoidable and unintentional carryover of the veterinary drug in feed. This will help protect the health of the consumers and ensure fair practices in the food trade. SafeFish provided updates on the website.

SPS Notifications

The following provides an overview of the technical response that SafeFish has contributed to and/or notified stakeholders of changing regulations in export markets.

European Union SPS Notification 526 – Lowering maximum levels for mercury in cephalopods, marine gastropods and muscle meat of certain fish species

On 13 December 2021 the EU announced that it plans amend Commission Regulation (EC) No. 1881/2006 to lower existing MLs for mercury in cephalopods, marine gastropods and muscle meat of certain fish species. The EU rationale for the change included that recent occurrence data showed that there would be a margin to lower the ML for mercury in various fish species which would further reduce the dietary exposure to mercury. The proposed MLs for total mercury will be 0.3 mg/kg, 0.5 mg/kg, or 1.0 mg/kg depending on species, and limits apply to individual samples.

These MLs are generally lower (more restrictive) than what is specified in the FSC. SafeFish informed key sector associations of the proposed changes. SafeFish also prepared a summary document that highlighted the changes and provided this to DAFF. The EU subsequently amended Regulation (EC) No 1881/2006 in April 2022.

Japan SPS Notifications 847 and 892 – MRL for eugenol and isoeugenol

On 19 October 2021 Japan adopted renewed MRLs for eugenol in Salmoniformes (such as salmon and trout), Anguilliformes (such as eel), Perciformes (such as bonito, horse mackerel, sea bass, sea bream and tuna), other fish, and crustaceans. On 6 December 2021 Japan also announced proposed MRLs for isoeugenol in Salmoniformes, Anguilliformes, Perciformes, and other fish. No date was specified for adoption. SafeFish informed key sector associations of the changes and provided further information on eugenol (not currently registered for use by the APMVA for any seafood), isoeugenol (approved by APVMA for use in salmonids) and clove oil.

European Union SPS Notification 566 – Maximum Levels of Inorganic Arsenic in Foods

On 13 May 2022 the EU announced that it looking to amend Commission Regulation (EC) No. 1881/2006 to lower the existing ML for inorganic arsenic in non-parboiled milled rice (polished or white rice) and establish new MLs for inorganic arsenic in rice flour, rice-based drinks, fish, crustaceans, bivalve molluscs, food for infants and young children, fruit juices, concentrated fruit juices and nectars and salt.

SafeFish prepared a background document that provided context and compared the proposed MLs to the concentrations of inorganic arsenic in Australian seafood (data from 2003-2013). The proposed EU levels were substantially lower than the MLs in Australia and New Zealand which may cause market access issues in the future. SafeFish notified sector-level representatives of the proposed changes and worked with FSANZ, DAFF, State regulators, industry members and various laboratories to pull together more information on levels of inorganic arsenic in Australia.

The SafeFish analysed occurrence data of inorganic arsenic in seafood from the Global Environment Monitoring System (GEMS) Food Contaminants database and distributed the findings to the interested parties. Additional total arsenic and/or inorganic arsenic data occurrence data in various bivalve species was sourced from Scallop Fishermen's Association of Tasmania, ShellMap, Victorian Fisheries Authority, NSW Food Authority, WA Department of Health and provided with permissions to DAFF. The Australian Government provided a response to the EU's SPS notification. The EU's proposed MLs were based on the 'As Low As Reasonably Achievable' (ALARA) principle. However, some seafood can be a relatively high source of inorganic arsenic.

The proposed MLs were considered by SafeFish to be beyond what was 'reasonably achievable' under the ALARA principle. In October 2022, in light of information from third countries and stakeholders the European Commission's Standing Committee on Plants, Animals, Food and Feed voted to remove the establishment of MLs for inorganic arsenic in fish and other seafood from the proposal, but noted that they would be dealt under a separate proposal. The rationale was that any MLs for certain seafood species would require further fine-tuning.

European Union SPS Notification 760 – Smoke Flavourings

On 3 May 2024 the EU announced the pending withdrawal of ten smoke flavourings from their list of authorised smoke flavouring primary products. This decision followed a recent EFSA assessment that eight of the smoke flavourings may impact human health and renewal applications for the other two smoke flavourings were not submitted. The anticipated date of adoption of this withdrawal was June 2024, with transitional provisions applying. SafeFish informed a large range of industry representatives and sector associations of the proposed changes.

South Africa SPS Notification 85 – Compulsory Specification for Dried Abalone

On 10 June 2024 South Africa announced that it intends to declare a new Compulsory Specification for dried abalone. The Compulsory Specifications appear to only impact establishments within the Republic of South Africa. Imported products need to adhere to the health guarantees under their legislation. SafeFish asked the Abalone Association of Australasia if any processor exports dried abalone to South Africa as they are releasing new product specifications.

Chinese Taipei SPS Notification 635 – Quarantine Requirements for Live RedClaw

On 8 November 2024, Chinese Taipei announced draft amendment of the "Quarantine Requirements for the Importation of Live Crustaceans and Molluscs" to include a number of suspectable species related to the Decapod Iridescent Virus 1. SafeFish is of the understanding that Decapod Iridescent Virus 1 has not been detected in Australia. SafeFish notified the Queensland Crayfish Farmers Association of the changing requirements.

Hong Kong, China SPS Notification 50 – Maximum Levels for Methylmercury in Fish

On 16 December 2024, Hong Kong announced that it plans to modify the maximum levels (MLs) for methylmercury in various fish/seafood products. Hong Kong proposed to adopt individual MLs for methylmercury in Tuna, Alfonsino, Marlin, Shark, Orange Roughy and Pink Cusk-eels. These proposed MLs are in line with the latest Codex Standard (CXS 193-1995). Hong Kong have also proposed to maintain the existing ML for methylmercury in all other fish (unless otherwise specified) and to introduce a ML for methylmercury in fish balls/fish cakes. SafeFish circulated the notification widely. Amendments are expected to be implemented during 2025.

Canada SPS Notification 1586 – Maximum Residue Limit for Isoeugenol

On 11 February 2025 Canada announced that it plans to introduce a maximum residue limit (MRL) for isoeugenol in muscle and skin of salmonids in natural proportions at 0.5ppm (0.5 mg/kg). The proposed MRL is significantly lower than what is permitted in Australia. SafeFish notified representatives from the salmon industry of the proposal.

European Union SPS Notification 825 – Maximum Levels of Inorganic Arsenic in Fish and Other Seafood

On 7 March 2025, the European Union announced that it intends to introduce Maximum Levels (MLs) for inorganic arsenic in fish, crustaceans, bivalve mollusc, and cephalopods. The proposed EU MLs for inorganic arsenic are substantially lower than the MLs in Australia and New Zealand but higher than those proposed in 2022. SafeFish notified sector-level representatives of the proposed changes highlighting the background and potential implications. Discussions are ongoing to determine if a response is warranted.

European Union SPS Notification 844 – Requirement for tuna frozen in brine

On 25 March 2025, the European Union announced that it intends to modify Regulation (EC) No 853/2004 which lays down specific hygiene rules for food of animal origin. Proposed changes alter the monitoring and validation requirements for tuna frozen in brine. SafeFish notified Tuna Australia and the Australian Southern Bluefin Tuna Industry Association of the proposed changes.

FAO and WHO Activities

FAO and WHO undertake a range of activities including the provision of scientific advice to Codex, other United Nations agencies and FAO and WHO Member countries. The following FAO and WHO activities provides advanced warnings about emerging food safety issues and the latest science that may be used to underpin future Codex activities and SPS notifications.

Chemical water safety (FAO/WHO)

FAO and WHO have started a project to provide scientific advice on chemical water safety (including emerging contaminants). Use of good quality water at different stages of the agrifood system is crucial for food safety. An ad hoc FAO/WHO expert meeting will be held in May 2025 to facilitate the finalization of this document, discuss the findings and provide recommendations.

Climate change: Current and anticipated food safety issues (FAO)

In April 2020 FAO released a report titled “Climate change: Unpacking the burden on food safety”. The purpose of the report was to identify and attempt to quantify some current and anticipated food safety issues that are associated with climate change. The food safety hazards considered in the publication are foodborne pathogens and parasites, harmful algal blooms, pesticides, mycotoxins and heavy metals with emphasis on methylmercury. There is also a section on the benefits of forward-looking approaches such as horizon scanning and foresight, that include microplastics and novel food production systems.

Microplastics – Assessing human exposure and implications for human health (FAO/WHO)

In 2022 the FAO released a report titled “Microplastics in Food Commodities: A Food Safety Review on Human Exposure Through Dietary Sources”. The report outlines the existing literature on the occurrence of microplastics and their associated contaminants in foods. It estimates the dietary exposure of consumers to these materials, highlights some knowledge gaps with respect to their relevance to public health, and offers some recommendations for future work on microplastic particles to support food safety governance.

In August 2022 the WHO released a report titled “Dietary and inhalation exposure to nano- and microplastic particles and potential implications for human health”. The report considered the exposure from the environment, including exposure via food, water and air. The WHO assessed the risks to human health from exposure to microplastic particles from the environment, and identified research needs and defined the scope of future work needed on microplastic particles to address current uncertainties.

In September 2023 the FAO released a report titled “The impact of microplastics on the gut microbiome and health – A food safety perspective”. The report noted that the number of available studies evaluating the impacts of microplastics on the gut microbiota is limited and recommended further research is required to understand if and how microplastic exposure or co-exposure with other chemicals affects the host and the gut microbiome.

Risks and benefits of fish consumption – Update (FAO/WHO)

In October 2023 the FAO and WHO convened an expert meeting to update the 2010 report on the risks and benefits of fish consumption. The expert consultation considered new scientific evidence which focused on:

- Evidence of health benefits from fish consumption;
- Toxic effects of dioxins and dioxin-like Polychlorinated biphenyl (PCBs);
- Toxic effects of methylmercury;
- The role of selenium regarding the health effects of methylmercury;

Occurrence data for methylmercury, dioxins and dioxin-like PCBs in fisheries and aquaculture products was considered. A Summary Report is available [here](#) and the Joint FAO/WHO Expert Consultation on the Risks and Benefits of Fish Consumption report was published in October 2024.

The updated report concluded that consuming fish provides energy, protein and a range of other nutrients important for health, and that there are benefits related to fish consumption during all life stages (pregnancy, childhood and adulthood). General population studies show that the benefits and individual effects of fish consumption vary depending on overall diet, the characteristics of consumers, and the fish that is consumed. Risk–benefit assessments at regional, national or even subnational levels are needed to refine fish consumption recommendations considering local consumption habits, fish contamination levels and nutrient content, nutritional status of the population of interest, cultural habits and demographics.

The report also recommended nations develop and evaluate risk analysis strategies (risk assessment, risk management and risk communication) that maximise the benefits and minimise the risks from consuming fish.

Seaweed safety (FAO/WHO)

In 2022 FAO and WHO released a report identifying food safety hazards (microbiological, chemical and physical) linked to the consumption of seaweed and aquatic plants. A copy of the report containing current status and future perspectives is available [here](#) and it is an output from an Expert Meeting held 28-29 October 2021.

Technical Representatives at Codex

SafeFish technical delegates were sent to the following Codex meetings to build technical capability and understanding of the Codex processes, and to assist the Australian delegation through the provision of technical expertise on issues that had the potential to affect Australian seafood:

Dr. Stephen Pahl (SARDI) attended the 53rd Session of the Codex Committee on Food Hygiene (CCFH53) meeting in San Diego, California (USA) in November/December 2022. At this meeting the Australian delegation:

- provided specific technical input into the development of the Guidelines for the Safe Use and Reuse of Water in Food Production.
- supported progressing future work on revising the following:
 - Guidelines on the application of general principles of food hygiene to the control of pathogenic *Vibrio species* in seafood
 - Guidelines on the application of general principles of food hygiene to the control of viruses in food
 - Guidelines on the application of general principles of food hygiene to the control of *L. monocytogenes* in foods.

Dr. Stephen Pahl (SARDI) attended the 54th Session of the Codex Committee on Food Hygiene (CCFH54) in Nairobi, Kenya from 11 Mar to 15 Mar 2024 as a technical representative on the Australian delegation. Issues relevant to seafood where SafeFish provided advice/ support included:

- Guideline on the Application of the General Principles of Food Hygiene to the Control of Pathogenic *Vibrio species* in Seafood (Step 5).
- Guidelines for the Safe Use and Reuse of Water in Food Production and Processing (CXG-100-2023) (Step 2/3).
- Guidelines on the Application of General Principles of Food Hygiene to the Control of Viruses in Food (CXG 79-2012).

Mr. Damien Farrington (Townsville Public Health Unit) attended 17th Session of the Codex Committee on Contaminants in Foods (CCCF17) in Panama City, Panama from 15 Apr to 17 Apr 2024 as a technical representative on the Australian delegation. Issues relevant to seafood where SafeFish provided advice/support included:

- Code of Practice/Guideline for the Prevention and Reduction of Ciguatera Poisoning (Step 4).
- CX/CF 24/17/6 Sampling plans for Methylmercury in Fish (Step 4).

Appendix 5: SafeFish Stakeholder Survey

In October 2025 a virtual survey was developed and sent to SafeFish stakeholders to gauge the value and relevance of the services and outputs that the program delivered between 2021-2025. The survey was sent virtually to all registered SafeFish stakeholders (n=326) and was also included as a pop up feature on the SafeFish website homepage (triggered n=350 times). A total of 35 responses to the survey were received with a 67.9% completion rate.

The survey comprised of 13 questions that asked participants to identify their sector, describe how they engaged with SafeFish, and rank the value of its services. Respondents were then asked to rate overall satisfaction with performance, indicate which resources they had used, and share where they typically found food safety information from. The survey explored preferred communication channels for updates and invited suggestions for future research priorities. Additional questions covered perceptions of communication volume, whether respondents had made enquiries previously, and how they rated the response received. Finally, participants were asked to agree or disagree with statements about SafeFish' trustworthiness, reputation, and role as a core FRDC service, and to provide any further feedback. Results from individual questions are shown below.

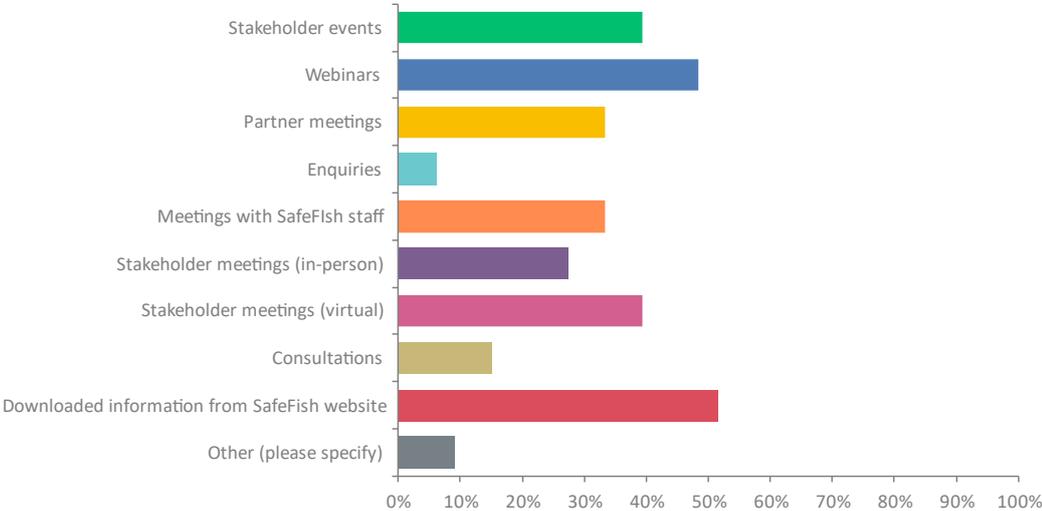
Q1: Please indicate what sector you belong to:

Answered: 35 Skipped: 0

ANSWER CHOICES	RESPONSES	
Contractor	2.86%	1
Health regulator	0.00%	0
Importer/Exporter	0.00%	0
Industry organisation	31.43%	11
Commonwealth/State/Territory enforcement authority or regulator	8.57%	3
Recreational fisher	2.86%	1
Researcher	11.43%	4
Retailer/Distributor	0.00%	0
Seafood business	31.43%	11
Service provider (e.g. Laboratory)	0.00%	0
Student	0.00%	0
Other (please specify)	11.43%	4
TOTAL		35

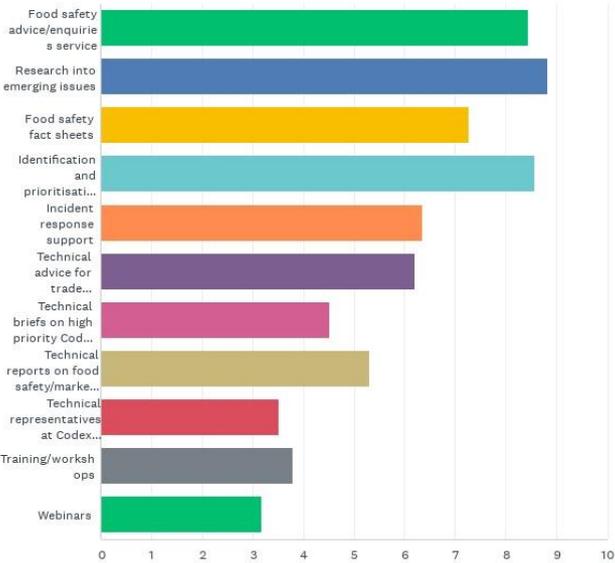
Q2: Please nominate how you have engaged with SafeFish (select all that apply)

Answered: 33 Skipped: 2



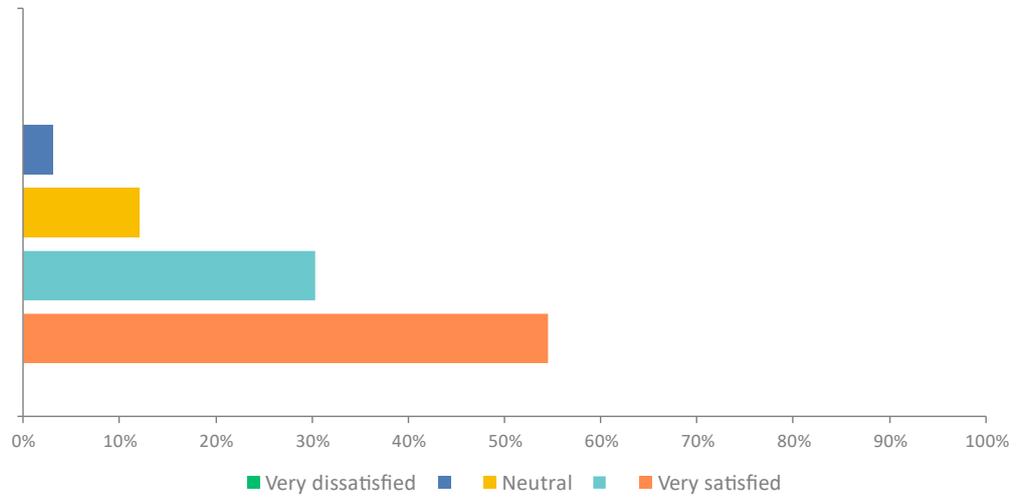
Q3: SafeFish provides the following services. Please rank these in your order of preference from the most to least valuable (1 being most important, 11 being least)

Answered: 33 Skipped: 2



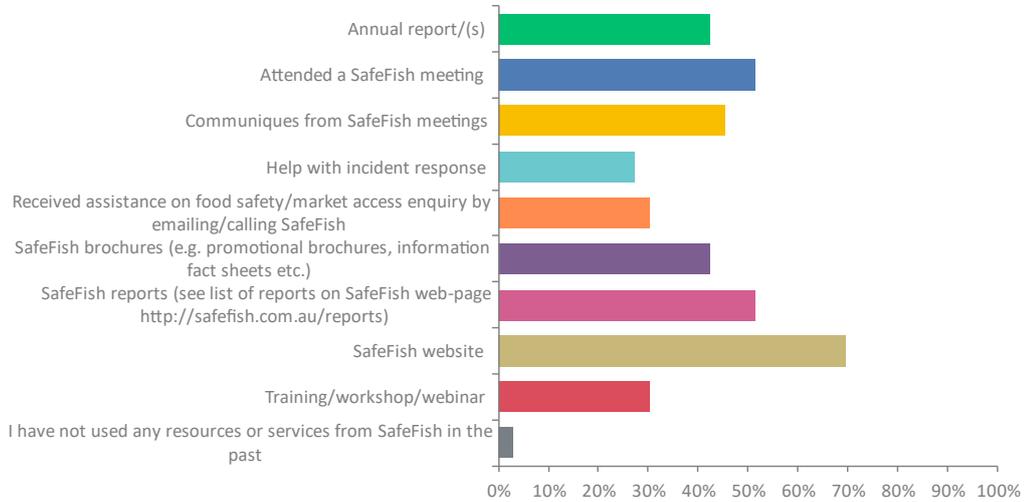
Q4: Please rate your satisfaction with SafeFish' overall performance in the past year

Answered: 33 Skipped: 2



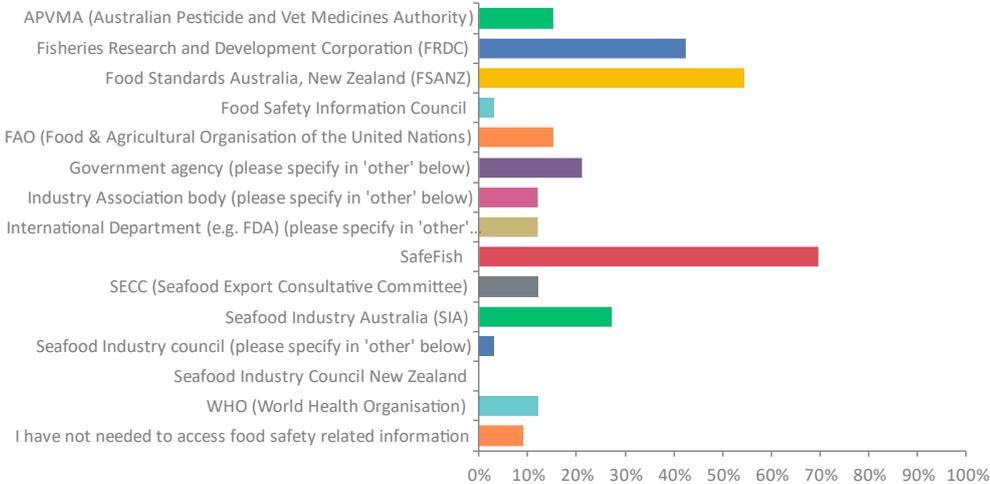
Q5: What SafeFish information/resources/services have you used in the past (mark all that apply)?

Answered: 33 Skipped: 2



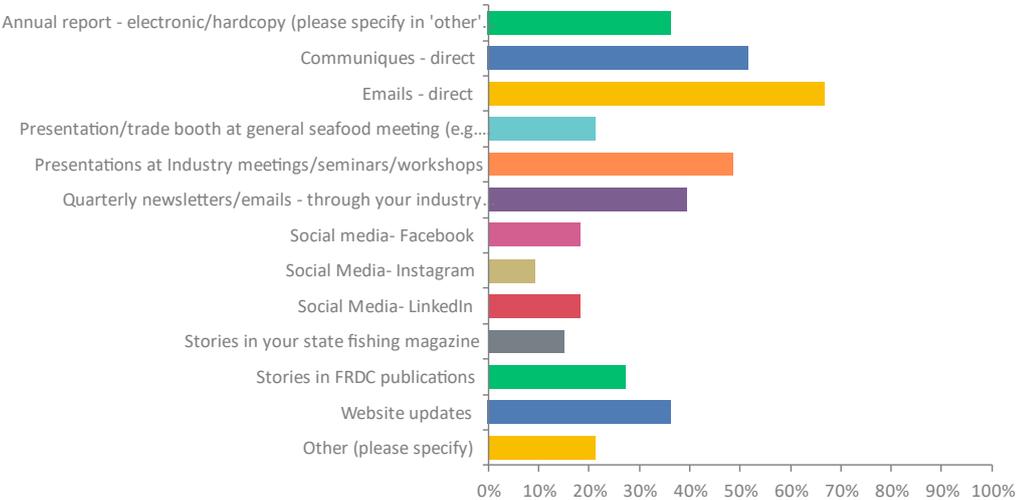
Q6: Where/who do you go to for information on a food safety related issue (mark all that apply)?

Answered: 33 Skipped: 2



Q7: What would be the best way to communicate SafeFish activities, outcomes and achievements to you (mark all that apply).

Answered: 33 Skipped: 2



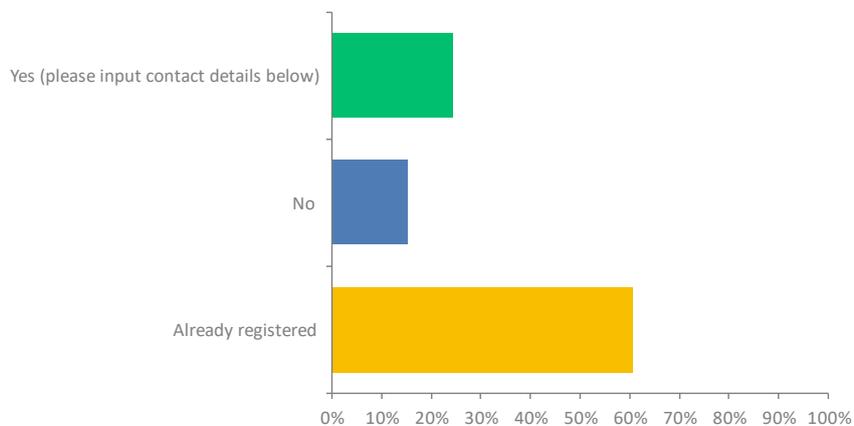
Q8 Please list any future projects or research areas relating to food safety and/or market access that you would like SafeFish to support: (e.g. food safety risks associated with climate change, microplastics, vibrios, biotoxins, industry training etc.).

Answered: 17 Skipped: 18

#	RESPONSES	DATE
1	Vibrios, biotoxins, & Heavy metals	11/24/2025 7:03 PM
2	microplastics	11/11/2025 12:37 AM
3	Emerging food safety issues, particularly relating to climate and ESG.	11/10/2025 3:24 PM
4	Ali has the project proposals approved by the WRL Board for future works regarding lobster market access and heavy metal investigations towards processing areas of possible contamination of white flesh from hepatopancreas and determining global standards for MLs, sampling and testing	11/10/2025 2:52 PM
5	General discussions to better align and understand food safety regimes in trade partner countries, e.g. with GACC re: sampling methodologies	11/10/2025 2:45 PM
6	food safety & consistent naming of products	11/10/2025 2:39 PM
7	Food safety risks associated with climate change	11/10/2025 2:21 PM
8	Whatever emerges as per the issue prioritisation process - the process is supported	11/10/2025 1:14 PM
9	Impacts of HAB on finfish. I really don't like the discussion about microplastics as it sends the wrong message about the Seafood Industry.	11/10/2025 1:09 PM
10	I would like SafeFish to continue their focus on Vibrio and HABs, as current issues that will only get more difficult in the future. Focusing on climate change as a driver may stimulate expansion to related issues such as other opportunistic zoonoses (e.g. AMR Shewanella) or changes in ocean biochemistry, but with limited resource I think it's better for SafeFish to tackle a narrower scope of issues more effectively.	11/10/2025 11:17 AM
11	Enhance the overall food safety culture in the seafood industry	11/10/2025 10:51 AM
12	Food safety risk in relation to imported seafood.	11/10/2025 10:21 AM
13	Transfer of seafood safety across the supply chain, and responsibility of incident at different points in the supply chain. Especially if products are mixed at some point.	11/10/2025 10:01 AM
14	Brevetoxins, vibrios.	11/7/2025 12:15 PM
15	Emerging chemical contaminants (PFAS, pesticides, etc.)	11/5/2025 8:42 AM
16	industry training	11/4/2025 2:03 PM
17	Species and area of origin testing and access	11/4/2025 8:09 AM

Q9: SafeFish maintains a stakeholder register for communications. This register is also used to contact stakeholders when SafeFish needs advice on technical/industry practices. Would you like to be included on this register?

Answered: 33 Skipped: 2



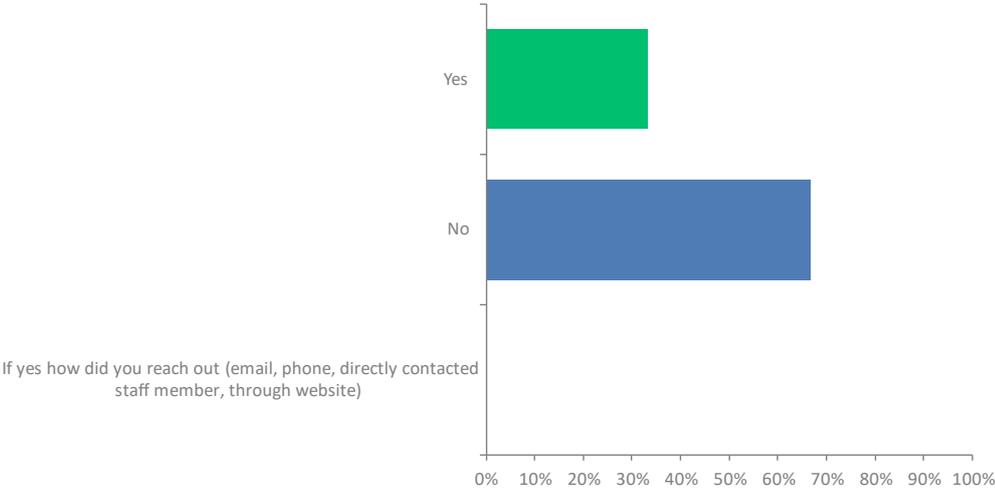
Q10: How do you feel about the amount of communication you receive from SafeFish via email?

Answered: 33 Skipped: 2

ANSWER CHOICES	RESPONSES	
I would like more communication	15.15%	5
I would like less communication	0.00%	0
I receive the right amount of communication	78.79%	26
I am not part of the SafeFish distribution list for communication	6.06%	2
TOTAL		33

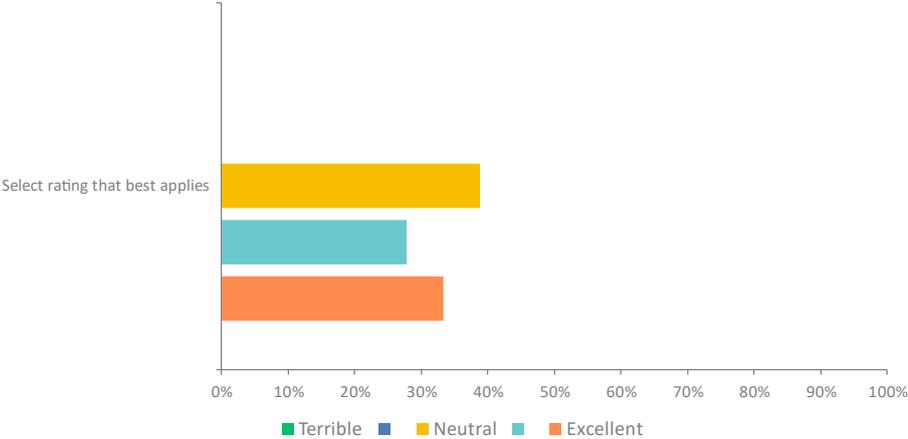
Q11: Have you contacted SafeFish in the last 12 months with an enquiry?

Answered: 33 Skipped: 2



Q12: How would you rate the response that you received to your enquiry?

Answered: 18 Skipped: 17



Q13: Please select how much you agree or disagree with the statements below relating to SafeFish

Answered: 33 Skipped: 2

