



National
SCIENCE
Challenges

A YEAR IN REVIEW
JUNE 2021 - JULY 2022

**HIGH-VALUE
NUTRITION**

Ko Ngā Kal
Whai Painga



OUR PURPOSE

The core purpose of the High-Value Nutrition | Ko Ngā Kai Whai Painga National Science Challenge is to develop high-value foods with validated health benefits to drive economic growth for Aotearoa New Zealand. We invest in science excellence and building collaborative relationships between research and industry to create new platforms, build capabilities, and enable innovation.

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SUMMARY

About Us

The objective of the High-Value Nutrition | Ko Ngā Kai Whai Painga National Science Challenge (HVN NSC) is to **develop high-value foods with validated health benefits to drive economic growth.**

The HVN NSC runs four Priority Research Programmes in the following areas of health: **Digestive, Immune, Infant and Metabolic.** We also have the scope to work in other aligned health areas via our Contestable Fund. Underpinning the HVN NSC research are two Enabling Programmes – **Science of Food** and **Consumer Insights** – which ensure investigational products in our programmes are desirable for consumers, innovative and suitable to be taken as food.

The HVN NSC is funded by the New Zealand Ministry of Business, Innovation and Employment (MBIE) and is hosted at the Liggins Institute by the University of Auckland, with the University of Otago, Massey University, AgResearch and Plant & Food Research as primary collaborating institutions. **HVN's scope of funding and collaboration is not limited to these institutions and it supports projects across Aotearoa New Zealand.**

Our Strategy

We invest in research projects that enable Aotearoa New Zealand's Food & Beverage (F&B) companies to move from being trusted suppliers of foods that are not only safe to eat, but that are also designed to support sustained good health.

The period of June 2021 to July 2022 saw the final call for HVN Contestable Fund proposals, with the fund ultimately being oversubscribed. With the last set of projects now underway, HVN is shifting its focus to ensuring the closure of the programme in 2024 leaves behind key outputs for future use by New Zealand's researchers and F&B sector.

Our Highlights



Established **17** new projects in collaboration with **16** new industry partners, including **4** large businesses and **12** small- and medium-sized enterprises.



Completed a pilot study that **validated a metabolic health scoring tool** (MetS-Z score) for use in Aotearoa New Zealand by current and future researchers.



The national dietary intervention study – '**He Rourou Whai Painga**' – was launched. The study uses a whānau-based approach and Aotearoa New Zealand food & beverage products to tackle type-2 diabetes and other metabolic diseases.



Commenced a large study on a **kūmara-based weaning food** to evaluate infant development.



Commenced a unique residential study evaluating diet and ethnicity on risk of type-2 diabetes with **13** industry partners providing **23** products.

Our Highlights

Continued to support the **Pūhoro STEMM Academy** which expanded student offerings to include both research internships and work placements (**13** in 2021-2022).



Deployed **world-leading technologies** within clinical trials, including advanced MRI imaging and gas-sensing capsules which will provide never before seen information within dietary studies.



Finalised **planning of remaining clinical trials** for the Infant Health and Metabolic Health Priority Research Programmes.



Implemented a **co-governance model** in support of our Vision Mātauranga strategy.



Continued work on a robust portfolio of projects working with products from across Aotearoa New Zealand's food & beverage industry.





OUR SCIENCE

Impact

HVN achieves impact through clinical validation of food-health relationships, discovering novel and meaningful biomarkers, supporting industry with evidence for health claims and ensuring activities are aligned to consumers' needs in export markets. Supply chain issues and staffing turnover caused by the post-pandemic surge in international demand posed challenges in 2021-2022, but the F&B industry and research community once again adapted to stay the course.

Digestive Health – the programme has finalised remaining clinical trial details with industry partners and is in full motion. The programme is analysing data generated from across its portfolio and disseminating information to industry partners and the public via peer-reviewed scientific journals.

Immune Health – the programme has completed work to validate underpinning aspects of a screening technology platform, and is working to complete associated clinical studies. Industry interest in the platform led to successful processing of samples, with collaborators now in discussion about next steps and how to take advantage of the findings.

Infant Health – the programme kicked off a large clinical trial using a kūmara-based weaning product to evaluate impacts when consumed by infants. Rich in a prebiotic, the kūmara-based product may positively influence infant gut health. A second clinical trial has also been finalised for the coming year.

Metabolic Health – the programme has clinical trials in full swing, with an additional clinical trial planned to start in the coming year. Similar to the Digestive Health programme, this programme is analysing data generated from across its portfolio and disseminating information to industry partners and the public via peer-reviewed scientific journals.

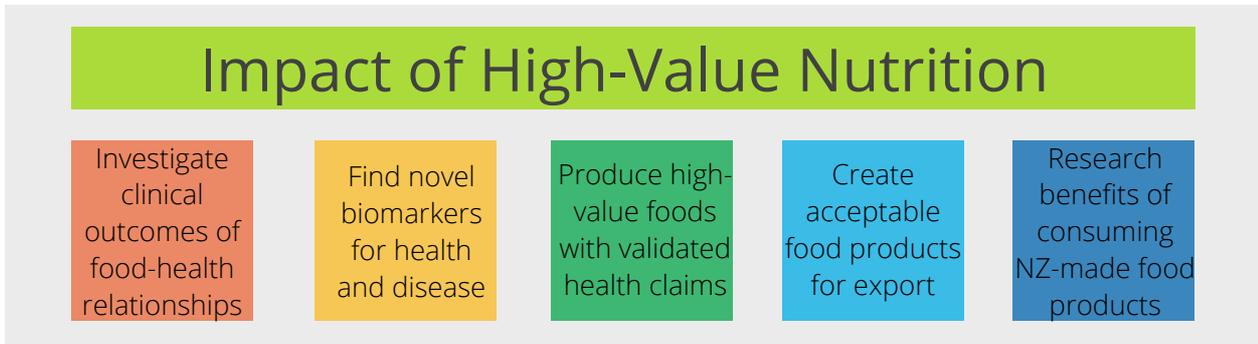


Figure 1: The HVN NSC has wide impact potential within Aotearoa New Zealand and beyond.

Future impact and economic value of the HVN NSC will be consolidated through the nation-wide, HVN-led 'He Rourou Whai Painga' study focusing on the health outcomes of those consuming a predominantly Aotearoa New Zealand-derived diet. This large study utilises the wealth of knowledge shared by local communities, Māori researchers, previous HVN work, and the F&B industry in Aotearoa New Zealand.

The main study for 'He Rourou Whai Painga' is now underway, having been informed by a completed preceding pilot study.

Science Excellence

The HVN NSC has seen world-leading innovative approaches adopted within the Digestive Health and Immune Health Priority Research Programmes.

In collaboration with the New Zealand Milks Mean More MBIE-funded Endeavour programme, hosted and led by the Riddet Institute at Massey University, the Digestive Health programme successfully contributed to a joint study comparing dynamics of digestion of milk that were processed in different ways. As part of the study, magnetic resonance imaging (MRI) analyses of stomach-emptying were combined with novel body gastric surface mapping techniques that use electrical signals emanating in the stomach and other organs to monitor transit of food through the gastrointestinal tract. The Digestive Health programme – in collaboration with Zespri – also largely completed a study examining how kiwifruit can aid digestion using non-invasive technologies. Gas-sensing capsules were used to measure gasses produced due to gut microbiological metabolism, transmitting the information wirelessly to handheld receivers and a mobile software app. The capsules were used in conjunction with other technologies to quantify colonic transit time, pressure, pH, and temperature - all through transmission of data to transponders worn by participants. Publications from these studies are in preparation and expected to be published by the end of 2023 or early 2024. The methods used in these studies constitute innovative and new approaches to further increasing the 'science stretch' of HVN's Priority Research Programmes.

The Immune Health programme has made progress in the development of a platform technology aimed at 'nutritional immunology'. Samples from food intervention studies have been submitted to the team at the Malaghan Institute of Medical Research and will

be used in the technology platform to investigate the response of immuno-metabolism biomarkers to different diets. The aim of this platform's development is to make it available to New Zealand F&B companies to explore the functionality of their products.

As of 2021-2022, there were 280 publications (directly funded and aligned) in peer-reviewed sources from HVN NSC programmes since 2014, reflecting high productivity and outputs.

Research Collaboration

The HVN NSC continued to engage with organisations and individuals across New Zealand via its unique cross-functional teams. This year saw HVN wrap up its final Contestable Fund call for proposals and the initiation of its flagship dietary intervention study: 'He Rourou Whai Painga'.

A total of 17 new projects were funded through the Contestable Fund, bringing in 7 new researchers and 16 new industry partners. The successful project teams cover a broad range of F&B sectors and encompass a range of activities to support commercialisation, including product development, clinical research, regulatory and consumer science. A number of funded projects are also of national significance. Each of these industry partners bring useful perspectives to the research team building on HVN's strategy of ensuring science will be of value to our industry partners.

A MBIE-commissioned survey, conducted by a third party, showed stakeholders have continued confidence in the research teams and HVN NSC leadership. Industry stakeholders expressed a 'win/win' relationship that combines their commercial acumen with researchers' extensive knowledge. The report also noted stakeholders have confidence in HVN NSC leadership to provide strategic oversight, deliver on objectives, and facilitate the process through to successful outcomes.

The preceding year's 'He Rourou Whai Painga' pilot study was successfully completed, and associated learnings used to improve the design of the main study, which was launched this year. The leadership team saw the addition of Dr Anna Rolleston (Ngāti Ranginui, Ngai Te Rangi, Ngāti Pukenga) who brings extensive expertise to the team and is leading a kaupapa Māori wellbeing questionnaire for Māori participants. Dr Fiona Lithander also joined the leadership team and brings skills in the delivery of clinical trials.

OUR BUSINESS

Stakeholder Engagement

Stakeholder engagement continued to be positive throughout 2021-2022. The MBIE-commissioned stakeholder survey noted key areas of feedback from respondents:

- Engagement has been open and transparent, and stakeholders report that there has been a collaborative approach to priority setting and co-design of the research.
- Stakeholders are very positive about the relationships and engagement with the HVN NSC.
- Stakeholders are very positive about their engagement with the HVN NSC, with key words to describe the relationship being: integrity, credible, reputable, credentials, knowledge, skills, expertise, flexible, responsive and open.

The HVN NSC made communications a priority not only in 2021-2022, but through to the end of the programme in 2024. Communications will focus on the ongoing outputs being generated across HVN's portfolio of projects, communicating ideas, learnings, and opportunities to all stakeholders.

In response to industry collaborator feedback, the HVN NSC's Science of Food Enabling Programme was partially repurposed to focus on stakeholders other than the Priority Research Programme. Two further projects are being supported by the programme, one of which involves an Intellectual Property (IP) expert who will be developing an IP guide and webinar series of value to industry – particularly smaller collaborators who typically do not have the resources to engage with IP experts.

With HVN's Contestable Fund now closed and design of projects settled, the focus heading into the programme's twilight years will be on communicating the incredible work of project teams and adding value to stakeholders wherever possible.

Vision Mātauranga

The HVN NSC implemented a co-governance model in 2021-2022. The HVN Board appointed Whaimutu Dewes (Ngāti Porou, Ngāti Rangitahi) as Co-Chair. He has an intense interest in the role of economics and governance in Aotearoa New Zealand and Māori economic development. Board Terms of Reference under a Co-Chair model were approved by the University of Auckland and the HVN NSC Collaborating Parties.

In addition to the appointment of a Board Co-Chair, the HVN NSC also created a Directorate position of Kaiarataki, Vision Mātauranga. The position was filled by Arohaina Owen (Ngā Rauru Kaitahi) who had previously experienced the HVN programme through a now completed Contestable Fund project with Kaitahi As One. She brings a strong business acumen and passion for Māori economies to the team. Arohaina's focus through 2021-2022 has been on enacting the HVN NSC's Vision Mātauranga strategy.

The 'He Rourou Whai Painga' science leadership team saw the departure of Dr Meika Foster and addition of Dr Anna Rolleston (Ngāti Ranginui, Ngai Te Rangi, Ngāti Pukenga). Dr Rolleston is Co-Director Putahi Manawa and Director of Centre for Health – Tauranga.

The MBIE-commissioned stakeholder survey (conducted by a third party) noted "...stakeholders perceive the HVN NSC to highly value and respect mātauranga Māori, and this is also seen in practice throughout the research." Stakeholders recognised that while there is limited Māori capacity across the science sector, there is evidence of Vision Mātauranga intent in the design and process of the research.

This past year the HVN NSC also commissioned a project to map out the regulatory landscape faced by F&B companies wishing to work with novel foods and food ingredients. This was in response to multiple funding proposals from Māori partners seeking to address similar issues. The project was designed to provide a tool for businesses wanting to work with endemic species in the F&B space, without addressing Access & Benefits Sharing and related issues. The HVN NSC was able to navigate this sensitivity by focusing on 'novel foods and food ingredients', which encompass taonga and non-taonga species, and included specific case studies on taonga and non-taonga species. The project was completed and generated a 'regulatory roadmap' tool for use by the F&B industry (available via the HVN website).

The HVN NSC continued to support the Pūhoro STEM Academy. The past summer saw 13 students placed in summer internships related to high-value nutrition across Aotearoa New Zealand.

Public Awareness

HVN's communications this year had a strong emphasis on the Tranche 2 Contestable Fund, with numerous funding announcements generating interest and wide media coverage. There was also media interest in the results of research from both the Priority Research Programmes and the Contestable Fund.

The HVN NSC has had widespread coverage in print, radio, television and online platforms: in New Zealand's mainstream media outlets (*Stuff*, *NZ Herald*, *Newsroom*, *RNZ*, *NBR*, *Newsroom*), industry media (*Farmers Weekly*, *Rural News*, *The Orchardist* etc.) and significant coverage from *FoodTicker* (NZ Food and Beverage media), which has a growing audience.

Of particular note is the coverage for the Contestable Fund project 'Pasture-Raised Advantage'. The study drew coverage in the mainstream print and online media (both general [*NZ Herald*, *Stuff*, *RNZ*] and industry [*Rural News*, *Beef Central*] media) and had a feature story on TVNZ's *Rural Delivery* programme, which provided detailed insight into the study and the results of the research.

Watch the Rural Delivery feature: [Beef Nutrition Study](#).

In addition to domestic media, stories about HVN are being covered by international media, including *Food Navigator*/*Nutra Ingredients*, providing exposure and awareness of HVN's research and mission to an international audience.

The HVN NSC sends a quarterly newsletter, *HVN Pānui*, which has broad reach, with an audience comprised of the public, scientists and industry.

The HVN NSC continues to be active on LinkedIn and Twitter, sharing regular news and updates. Both platforms have seen a sharp increase in followers over the last year. HVN also shares regular news on its website: news is the most popular content on the website.

Covid lockdowns and restrictions over the last year have impacted the HVN NSC's ability to engage in in-person engagement and events. The Riddet Institute-led HVN 'Science of Food' programme ran a series of free 'lunch and learn' webinars. The webinar series was designed for those with an interest in food innovation and high-value nutrition, across science and industry, and were pitched as being of particular value for SMEs.

OUR GOVERNANCE AND MANAGEMENT

Governance Updates

The HVN Board continued to operate effectively to ensure the HVN research portfolio is strategically focused and are now planning for successful programme completion. There was one notable change to the Board with the appointment of Whaimutu Dewes (Ngāti Porou, Ngāti Rangitīhi) to the role of Co-Chair. Whaimutu brings extensive experience in Māori legal affairs and industry operations that is highly complementary to the HVN mission and current Board skillset. Through an annual skills self-assessment, Board members reflected positively on the changes brought by the Co-Chair model.



Whaimutu Dewes



Arohaina Owen

To further strengthen the team, the appointment was made of Arohaina Owen to the Vision Mātauranga (VM) Programme Lead position with her joining the team in October 2021. Arohaina has focused on updating HVN's VM strategy and action plan, and ensuring the HRWP industry partners are recruited in an appropriate manner.

The MBIE-commissioned survey found stakeholders have confidence in HVN leadership to provide strategic oversight, deliver on objectives and facilitate the process through to successful outcomes. They also found strength in the commercial leadership and Māori representation in the HVN NSC.

"There's representation of appropriate people who understand the landscape of Māori-owned businesses, on the Board and throughout different levels of the organisation of the high-value nutrition group."

With the HVN NSC nearing its end in 2024, focus has turned to evaluating and communicating the impact the programme has made to the science and business communities. A series of case studies have been developed with five industry partners, and reporting templates updated to include economic outcomes.

The HVN Directorate continued to ensure robust processes were in place with the final allocation of the contestable funds. Research projects have all been sent out for external peer review, and a panel was convened to evaluate the final proposals submitted, with applications exceeding available funds. Since 2014, HVN received and reviewed 98 proposals, awarding funding to 53 (54% applicant success rate). Heading into the twilight years of HVN's operations, the Directorate will continue to monitor projects and ensure they remain on track for successful completion.

The HVN Directorate continues to drive forward with its Research Data Management project. This project aims to ensure future New Zealand researchers can access HVN clinical trial data for future value addition as scientific methods, techniques and questions evolve. The project's output – a metadata catalogue – is a key legacy item being left behind by the HVN NSC. As such, the project is taking care to embed within the document principles that respect Māori data sovereignty and good data governance.

Ma tini ma mano ka rapa te whai

*Many hands make light
work. Unity is strength.*

Host institution

