



National
Science
Challenges

A YEAR IN REVIEW
JUNE 2020 - JULY 2021

**HIGH-VALUE
NUTRITION**

Ko Ngā Kai
Whai Pāinga



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 4 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 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 2020 to July 2021 saw a surge of interest from the country's F&B sector, with multiple new projects successfully leveraging cutting-edge technologies developed by HVN programmes.

Our Highlights



Established **16** new projects in collaboration with **18** industry partners, **6** of whom are Māori entities.



13 new researchers joined new HVN-funded projects from across Aotearoa New Zealand.



Growth of a portfolio of projects combining mātauranga Māori with science methods, strengthened by increased Māori-led participants working with taonga.



Initiated the 'He Rourou Whai Painga' pilot study in preparation for a nation-wide dietary intervention study on reducing risk of Type-2 diabetes using Aotearoa New Zealand products.



Funded the creation of a regulatory and export roadmap tool available for use by all Aotearoa New Zealand F&B industry working with novel foods and food ingredients.

Our Highlights

Continued to support the Pūhoro STEMM Academy which expanded student offerings to include both research internships and work placements.



A second patent filed on a novel bioactive delivery system, with investment from an industry partner to evaluate options for licencing.



Completion of analyses from a Digestive Health Programme clinical trial on kiwifruit, with outcomes now being communicated to healthcare professionals.



Through hui with Māori advisors confirmed a move to a co-governance model in support of our Vision Mātauranga strategy.



Successful adaptation of clinical trials to COVID-19 lockdowns across projects and programmes. Our thanks to the the project teams for their incredible flexibility and perseverance!





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. While the pandemic continued to pose challenges in 2020-2021, the F&B industry and research community showed up in force to adapt and forge ahead.

Digestive Health - analyses from the programme's clinical trial on kiwifruit have been completed, with outcomes now being communicated to healthcare professionals. Two new clinical studies are in the works with industry partners. The programme's capabilities have also been integrated into a number of Contestable Fund projects to further benefit collaborators.

Immune Health - the programme is well underway in developing a world-leading immune profiling platform. Two clinical studies are underway to validate the platform's ability to evaluate immune impacts of F&B products. Industry interest in the platform was sustained in 2020-2021, with collaborators taking steps to secure samples from ongoing work for future value-added analyses.

Infant Health - the programme saw a revision to timeframes due to impacts of COVID-19 lockdowns. A kūmara product is now ready for use and the clinical trial team is set to begin once lockdown restrictions allow for participant involvement. Rich in a prebiotic, it may positively influence infant gut health and immunity.

Metabolic Health - the adaptation of this programme has proven itself in the recruitment of 13 industry partners to participate in its SYNERGY Study at the University of Auckland's residential Human Nutrition Unit. An additional clinical study is also planned with industry and due to begin in early 2022.

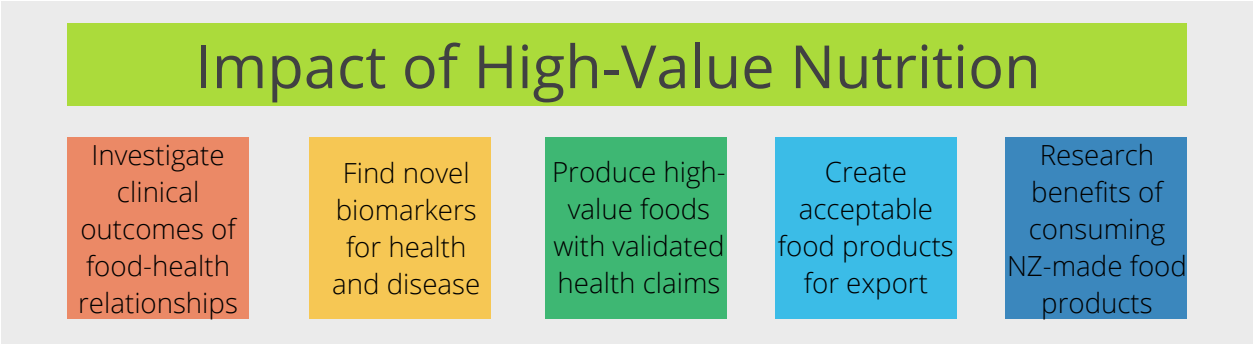


Figure 1: The HVN NSC has wide impact potential within Aotearoa New Zealand and beyond.

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

A pilot study for He Rourou Whai Painga is now underway and will inform the final design of the nation-wide study.

Science Excellence

The HVN NSC convened an international Science Review Panel to assess each of its four Priority Research Programmes (PRPs) at the end of 2020. The Panel was chaired by Te Tumu Paeroa Māori Trustee Dr Charlotte Severne (Ngāti Tūwharetoa, Ngāti Tūhoe) and Professor Sean Strain (Ulster University, Ireland), and was composed of an additional seven independent and internationally renowned science and business leaders.

The panel evaluated each of the HVN NSC's PRPs for science excellence and value to the NZ business community. The majority of the science was considered excellent and world leading, and the panel complimented the team on the thoroughness of the external review process for proposals. Revisions were needed largely due to the change in ability to conduct research in China. The most significant revision was to the Immune Health programme led by Dr Olivier Gasser of the Malaghan Institute of Medical Research (MIMR). Changes to the Immune Health programme were implemented following further assessment of a revised programme by two external evaluators.

The MIMR has been at the forefront of advances in multi-laser flow cytometry technology through their suite of instruments, single-cell sorters, and associated bioinformatic expertise. This enabled the identification of single cells with low expression of key biomarkers associated with, for example, a compromised immune system. The Immune Health PRP is seeking to be the first research programme in the world to demonstrate the value of this technology to the emerging science of nutritional immunology through

phenotyping immune-metabolism biomarkers of human samples recovered from dietary intervention studies. In due course, this approach will be available to NZ F&B companies to explore the functionality of their products.

As of 2020-2021, there were 214 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 generate significant interest from the research community and F&B sector via its Contestable Fund and Priority Research Programmes in 2020-2021. A total of 13 new researchers and 18 industry partners were brought in on 16 new projects across the HVN NSC. The industry partners were an even mix of large companies and small- to medium-sized enterprises (<50 employees). Co-design remains a strong component of all projects, ensuring the science is robust and the research relevant to industry.

To ensure maximum value is obtained for industry, we encouraged development of broad-reaching projects which encompass a range of activities that will support commercialisation, including product development, clinical research, regulatory, and consumer science all housed in one project. For example, the Tūhauora kawakawa project brings together 5 disciplines to support both industry partners involved. There was also stronger integration of the Consumer Insights programme across HVN, with participation in both Priority Research Programmes (PRPs) and Contestable Fund projects, adding additional value and outcomes, as well as opportunities for scientific researchers to understand more around consumer led research.

The HVN NSC also saw the development of a pilot study for a subsequent national dietary intervention study, He Rourou Whai Painga (HRWP). Māori stakeholders were engaged at the ideation stage, and continue to be involved in the study's design so that HRWP works in a culturally responsive and collaborative way, putting into action recommendations from multiple stakeholders.

In keeping with its iterative review process, the HVN NSC is currently undertaking a review of its Immune Health and Consumer Insights programmes to ascertain any opportunities for additional value.



OUR BUSINESS

Stakeholder Engagement

Stakeholder engagement continued to be strong for HVN throughout 2020-2021, particularly noted by an increase in industry interest and successful Contestable Fund project applications. A stakeholder survey was not conducted by the New Zealand Ministry of Business, Innovation and Employment (MBIE) this year. However, the HVN NSC is developing an informal survey before the end of 2021 to ascertain any points for improvement.

The HVN NSC's primary conference - 'Foodomics 2021' had to be rescheduled due to the nationwide COVID-19 lockdown. The conference was rescheduled for 28 February - 01 March 2022 and rebranded as 'Foodomics 2022'. Based on feedback received from Foodomics 2019, HVN has revised the programme to better showcase industry-led projects. A number of industry partners from HVN-funded projects will present their work and provide insights on translating science to market. The 2022 programme will strike a more meaningful balance between science excellence and application of said science for the F&B industry.

2020-2021 also saw the HVN NSC act upon its refreshed communications plan, garnering improved traffic across social media platforms and increased engagement from the F&B industry.

The HVN NSC continued to receive project proposals for its Contestable Fund towards the end of 2020-2021. The fund closed as of 31 August 2021, with the final pool of project proposals under review. A total of 28 proposals were received as part of the final call for proposals, with the demand outstripping the remaining funds available. Announcement of successful applicants will occur later in 2021.

Vision Mātauranga

The HVN NSC continued to implement its revised Māori engagement plan in 2020-2021. A Māori F&B industry mapping exercise completed in 2019-2020 set the stage for better engagement for development of proposals in 2020-2021. As a result, the HVN NSC saw a marked increase in successful applications to its Contestable Fund, with a number of projects now well underway.

Among projects developed were those working with taonga species. For example, a project working with kawakawa (*Piper excelsum*) is underway to examine the metabolic and immune effects of consuming this native plant. The project team, composed of Wakatū Inc, Chia Sisters, Edible Research Ltd, the Riddet Institute (Massey University), and the Liggins Institute (University of Auckland) are setting a trailblazing example for other Māori F&B stakeholders navigating the challenges of working with taonga species.

The HVN NSC remains committed to developing the next generation of highly skilled people in Aotearoa New Zealand. As such, we continue to support the Pūhoro STEMM Academy. The past summer saw 16 students placed in summer internships related to high-value nutrition across Aotearoa New Zealand; this coming summer student placements have been expanded to include both scientific internships and work placements to improve students' choices for experience.

July 2021 also saw the establishment of the Pūhoro Charitable Trust. Manahautū / Chief Executive Naomi Manu noted, *"In July 2021 Pūhoro Charitable Trust assumed responsibility for the Pūhoro STEMM Academy programme. Pūhoro Charitable Trust is created by, with and for Māori and will continue to engage rangatahi and whānau in much the same way noting that enhancements to the kaupapa will come as we look to expand and grow. One of those notable enhancements is a more explicit acknowledgement of mātauranga Māori as a knowledge system. Pūhoro Charitable Trust included an additional M representing mātauranga in STEMM."*



Research interns at the Pūhoro STEMM Academy Pō Whakanui Rangatahi, 2021.

Public Awareness

The HVN NSC's communications focus over the past year was on communicating updated research plans for Tranche 2 and numerous funding announcements related to the Contestable Fund. Interest in the Contestable Fund was very high and related funding announcements achieved good media coverage, and included coverage by *The Listener*, *National Business Review*, the *NZ Herald*, *Stuff.co.nz*, *Scoop.co.nz*, *Newshub*, and coverage and interviews on *Radio NZ*. Also of note was coverage of HVN by the international publications *Foodnavigator-asia.com* and *NutraIngredients-Asia.com*, which continued from last year. HVN initiatives with Māori industry partners were highlighted in mainstream media and print, as well as audio interviews on *Radio Waatea* and *teaomaori.news*.

Of particular note is the media coverage of HVN's funding of *Kaitahi As One - Smoothy Drops*. Funded via the HVN Contestable Fund, this project served as a solid foundation for *Kaitahi As One* in the *FoodStarter 2021* awards in April 2021, where their team were named the Small Suppliers Winner New Zealand 2021 for their line of 'smoothy drops'.



Pania Winterburn (left) and Arohaina Owen (right) at FoodStarter 2021.

Arohaina Owen, Director of *Kaitahi As One*, noted, *"It's not just those working in the business now that would benefit from winning. What gets us out of bed every day is knowing that Kaitahi is bigger than a brand, we are achieving so much more. We are bringing back traditional practices through using our native Māori ingredients and making these the norm again. As we grow, employment opportunities expand and so too do education opportunities and job skills."*

The HVN NSC continued to publish its quarterly e-newsletter and to engage with the public via regular updates on Twitter and LinkedIn. These platforms continued to see an increase in number of followers and active engagements with posted content.

The HVN Enabling Programmes - *Science of Food* and *Consumer Insights* - also held webinars this past year to highlight importance of immune-enhancing foods and new survey results regarding Chinese consumers' perceptions as impacted by the pandemic.

OUR GOVERNANCE & MANAGEMENT

Vision Mātauranga

In 2020-2021, the HVN NSC continued to move forward with recommendations from the preceding year's external governance review chaired by Te Tumu Paeroa Māori Trustee Dr Charlotte Severne (Ngāti Tūwharetoa, Ngāti Tūhoe). Through hui with Māori advisors the HVN NSC confirmed a move to a co-governance model in support of its Vision Mātauranga strategy. A Māori Co-Chair is due to be appointed to the HVN Board towards the end of 2021, along with the creation of a Māori leadership role within the HVN Directorate.



Dr Meika Foster

We thank Dr Meika Foster for all her contributions to the HVN NSC as the Vision Mātauranga Programme Lead. From July 2021 onward Dr Foster will be stepping out of this role but remaining engaged with the HVN NSC to ensure its continued success. Dr Foster has taken on the role of Co-Principal Investigator for the HVN NSC's He Rourou Whai Painga Pilot Study. The study is setting crucial groundwork for a subsequent nation-wide dietary intervention study examining health impacts of a dietary pattern that includes high-quality food and beverage products from Aotearoa New Zealand. The study will assess impacts on metabolic health, particularly in those at risk of Type 2 diabetes.

Governance Updates

The HVN NSC commissioned an external review of its governance and management processes in 2020-2021. The findings of the review highlighted that the HVN NSC is well-equipped to manage its portfolio of projects and programmes. Minor recommendations were made to streamline quarterly Board proceedings and these were implemented.

As mentioned in the preceding section, the HVN NSC confirmed a move to a co-governance model in support of its Vision Mātauranga strategy. A Māori Co-Chair is due to be appointed to the HVN Board towards the end of 2021, along with the creation of a Māori leadership role within the HVN Directorate.

The programme revisited its research data management approach for its Priority Research Programmes. A project with the University of Auckland's Centre for eResearch was renewed to steward the development of appropriate research data management protocols and associated templates. The Centre for eResearch's team identified data champions and information pipelines for key HVN clinical studies across Aotearoa New Zealand. The team successfully developed an approach which will be rolled out to the remaining Priority Research Programme clinical studies to capture a complete catalogue of data generated across HVN. This catalogue is intended to be made available to all at the end of the programme to enable and inform future research across Aotearoa New Zealand.

The NSC model's persistence beyond the current end date of 30 June 2024 remains unclear. As such, the HVN NSC has begun to plan for the closure of the programme. A dedicated strategic planning session is scheduled for the end of 2021 for the HVN Board to consider key aspects of the HVN NSC which need to be addressed in anticipation of the programme's end. Appropriate stakeholder engagement will follow to ensure important outputs from the HVN NSC are translated to relevant parties for maximum impact.

Ma tini ma mano ka rapa te whai

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

Host institution

