



National
SCIENCE
Challenges

A YEAR IN REVIEW
2019 - 2020

**HIGH-VALUE
NUTRITION**

Ko Ngā Kai
Whai Painga



OUR CORE 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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A close-up photograph of several kiwifruit hanging from a vine with green leaves. The kiwifruit are fuzzy and brownish-green, with some showing the dark, hairy stem at the bottom. The background is a soft-focus green.

SUMMARY

About Us

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

HVN 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 HVN's research are two Enabling Programmes - Science of Food and Consumer Insights - which ensure the investigational products in our other programmes are desirable for market, innovative, and suitable to be taken as food.

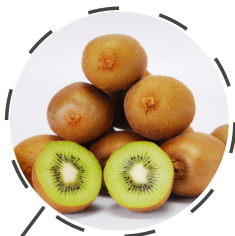
HVN is funded by the Ministry of Business, Innovation and Employment and is hosted at the Liggins Institute by the University of Auckland, with the University of Otago, Massey University, AgResearch, and Plant & Food Research as primary collaborating institutions. HVN's scope of funding and collaboration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

Our Strategy

HVN develops and supports 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.

2019-2020 saw HVN improve alignment of its activities and governance with Vision Mātauranga while positioning support for F&B companies to leverage cutting-edge technologies developed by HVN programmes over the past five years.

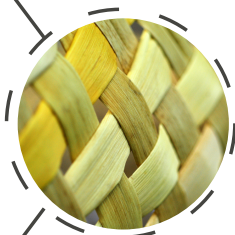
Our Highlights



New digestive health research demonstrates kiwifruit aids bowel regularity, which is commercially beneficial for the Aotearoa New Zealand kiwifruit industry.



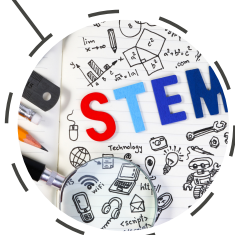
Established projects in collaboration with **11** industry partners, **6** of whom are Māori entities.



Mātauranga Māori and science working together to investigate the health effects of some Aotearoa New Zealand native flora and fauna.



Extension granted to a previously patented technology, allowing two HVN industry partners to potentially commercialise bioactives added to food.



Support put in place for the Pūhoro STEM Academy, with **16** Māori interns gaining scholarships, to help build Aotearoa New Zealand's capability and future innovators and leaders.

Our Highlights

Despite the impacts of COVID-19, **7** new projects were developed safely and most of HVN's existing projects were able to continue with little disruption.



Global opportunities for Aotearoa New Zealand hemp products were determined, allowing **23** organisations (majority Māori-owned) to move toward their goals and create growth for this emerging sector.



Over **40** new researchers joined HVN this year, with increased Māori involvement.



A critical hui was held with key Māori advisors to better support Māori participation within HVN and the appropriate use and protection of taonga species, with a focus on the Wai 262 Report.



Successful transition of HVN's work from the past 5 years of Tranche 1 for continuation of the programme under the Ministry of Business, Innovation and Employment's Tranche 2 of funding.





OUR SCIENCE

Impact

HVN achieves impact through clinical outcomes of food-health relationships, discovering novel and meaningful biomarkers, equipping investigational foods with validated health claims, and ensuring exports to consumers are marketed well and remain safe. While the global events of 2020 disrupted the Tranche 2 start date, the four Priority Research Programmes have used this time to plan, prepare, and mitigate against further potential interruptions.

Digestive Health - the Programme has found that kiwifruit is comparable to psyllium fibre as a treatment for constipation. This makes way for Zespri International Ltd to promote kiwifruit as a locally-grown food that definitively benefits wellbeing. There is space for such high-value exports to increase sales and sector growth. Additionally, two novel biomarkers relevant to digestion have also recently been identified.

Immune Health - originally set to conduct its clinical trials outside of Aotearoa New Zealand, the Programme pivoted to building a unique and world-leading immune profiling platform, which carries strong industry interest. They too have identified two new biomarkers that are significant in the immune health space.

Infant Health - continuing from Tranche 1 research, the Programme is set to trial kūmara as a common weaning food. Rich in a prebiotic, it may positively influence infant gut health and immunity. There is collaboration across HVN to create a novel weaning food with increased levels of resistant starch.

Metabolic Health - forging ahead with Tranche 2 and its focus on prevention of diabetes, including in high-risk Asian consumers, the Programme secured support from several industry partners. Each is providing food products for an upcoming clinical trial at the University of Auckland's residential Human Nutrition Unit. Metabolic Health was also successful in identifying several new biomarkers to help support diagnostics.

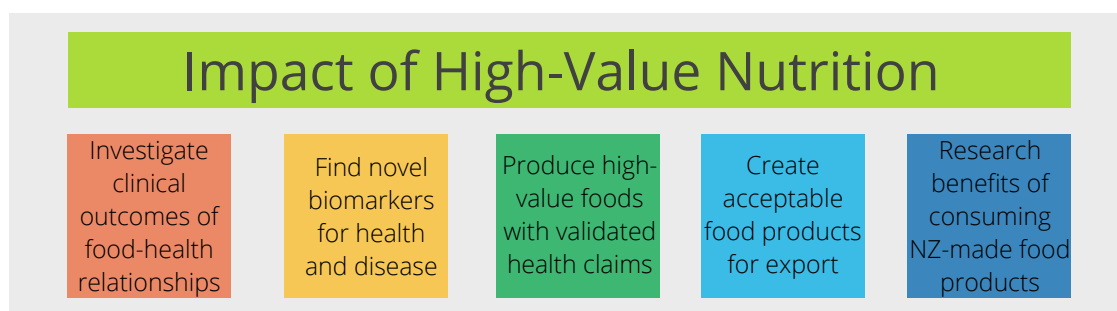


Figure 1: HVN has wide impact potential within Aotearoa and beyond.

Future impact and economic value of HVN 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.

Science Excellence

HVN continues to develop internationally recognised research programmes of high quality. To reflect on progress to-date and future plans, HVN convened an international Science Review Panel to assess each of its four Priority Research Programmes. The Panel was chaired by Te Tumu Paeroa Māori Trustee Dr Charlotte Severne (Ngāti Tūwharetoa, Ngāti Tūhoe) and Professor Sean Strain (Ulster University, Ireland). Sean remarked:

“Overall, with regard to my advisory role as Chair of the Science Advisory Panel since the beginning of the HVN NSC, the NSC has exceeded expectations. I regard that nutrition scientists in different institutions working collaboratively with each other and with industry are very positive outcomes of the programmes and must put nutrition science and the food and drink industry within New Zealand in a strong position to compete very successfully internationally.”

As of 2019-2020, there were 137 publications (directly funded and indirectly aligned) in peer-reviewed sources from the programmes since 2014, reflecting high productivity and outputs. Metabolic Health and Digestive Health programmes notably demonstrated scientific excellence through their output of publications in 2020, having produced 41 and 45 publications, respectively, in spite of delays caused by COVID-19.

International conferences were understandably scarce this year; however, with the transition to online events, we will see more HVN researchers present their work to a global audience. Dr Alejandra Acevedo-Fani from the Riddet Institute deserves a special

mention. Her scientific achievements were recognised with the prestigious Marie Skłodowska-Curie Fellowship; her proposal receiving a seal of excellence.

To support potential HVN collaborations, Contestable Fund applications are being accepted on an ongoing basis, rather than in a single annual call. Applications are peer-reviewed by a wide expert panel to ensure a high standard of science excellence continues.

HVN's current programmes responded to the pandemic of 2020 by adapting research protocols and using remote assessment tools to ensure science excellence is maintained in the face of social distancing.

Research Collaboration

HVN developed a process to bring in new researchers to the Priority Research Programmes and Enabling Programmes, resulting in 12 additional researchers participating in those programmes. HVN continues to engage with organisations and individuals across Aotearoa New Zealand via its unique cross-functional team. Co-design is a strong component of all projects, ensuring the science is robust and the research relevant to industry.

With a clear mission to work across industry and academia, the HVN Directorate is diversifying its cohort of researchers and stakeholders through two actions. First, the Directorate initiated a business-mapping exercise to assess the Māori business landscape in New Zealand's F&B sector. Second, the HVN Directorate initiated the development of a national dietary intervention study, He Rourou Whai Painga (HRWP). Māori stakeholders are being engaged at the ideation stage so that HRWP works in a culturally responsive and collaborative way, putting into action recommendations from multiple stakeholders.

Despite COVID-19, the HVN Directorate took strides to ensure emerging talent in HVN programmes have development opportunities. In lieu of attending international conferences, the Directorate initiated an internal webinar series, Lifting the Lid on HVN Research. To start positioning these early-career researchers for success in Aotearoa New Zealand, the HVN Directorate organised a presentation on Wai 262 by intellectual property expert Lynell Tuffery Huria (Ngāti Ruanui, Ngā Ruahine Rangi) to begin contextualising issues around Access & Benefit Sharing and taonga species. The webinar was the first of multiple planned professional development sessions to nurture our researchers and contribute to Vision Mātauranga.



OUR SUSTAINABLE BUSINESS

Stakeholder Engagement

Stakeholder engagement continued to be strong for HVN throughout 2019-2020, as noted in a stakeholder survey conducted by the New Zealand Ministry of Business, Innovation and Employment (MBIE). Stakeholders perceived HVN to be flexible, adaptive to the needs of industry, and open to feedback. Proactive engagement continued throughout the year with a move to increased online engagement due to COVID-19.

In response to feedback from stakeholders, HVN refreshed its communications plan and is working to target communications to be more effective in meeting industry's needs.

The current direction of HVN is perceived to be relevant to industry, and has materialised in a number of new partnerships. This year saw 10 businesses and 1 collective (composed of 23 businesses) work with HVN to support high-value nutrition product research demonstrating health benefits for consumers.

We continue to build new industry partnerships and support validation of a wide range of food and beverage products. A total of 20 products were supported by HVN research, ranging from whole foods such as kiwifruit to emerging products such as karengo seaweed.

HVN continued to review project proposals using a continuous intake model. The F&B industry has been very responsive, with a number of proposals in various stages of development heading into 2020-2021.

The HVN's Contestable Fund remains open and welcomes prospective applicants. For those interested, please email hvn@auckland.ac.nz or visit the [HVN website](#) for more information.

Vision Mātauranga

In response to feedback, HVN developed a revised Māori engagement plan and implemented actions to engage Māori industry and researchers, and develop Māori capability in relevant research areas.

2019-2020 saw HVN take steps to improve its engagement with Māori F&B industry by commissioning an industry landscape mapping exercise. This work was combined with focused messaging and support to encourage applications from Māori-owned businesses. The exercise revealed a vibrant community of businesses, and several project proposals are in development heading into 2020-2021.

The current year also saw new projects combining mātauranga Māori and scientific methods, using co-design models and co-leadership to evaluate the health effects of taonga species. Work on mamaku (tree fern) and karengo is well underway and shows promising results. Co-design and co-leadership provided insights for sustainable harvest practices and product development that have accelerated these projects, paving the way for further interest and support for these emerging products.

Developing the next generation of high-value foods means developing the next generation of highly skilled people in Aotearoa New Zealand. With that in mind, HVN took the opportunity to support the Pūhoro STEM Academy. Each year for the next four years, HVN will fund the placement of rangatahi in Pūhoro's internship programme to pursue projects related to high-value food and nutrition. This year saw 16 students confirm their placements across Aotearoa New Zealand and there is hope that number will grow next year.



Image: Some of the Pūhoro STEM Academy members receiving support from HVN

Public Awareness

With the start of new programmes of work, HVN's focus in 2020 was on communicating research plans for Tranche 2. Key articles highlighting HVN activities were in the media. These included an article in *The Listener*, which featured Professor Sally Poppitt, Principal Investigator on HVN's Metabolic Health Programme, and the *National Business Review*, which interviewed HVN's Consumer Insights Programme lead Dr Denise Conroy and key HVN industry partners Zespri and Anagenix.

HVN Challenge Director, Joanne Todd, was interviewed by Ingenio magazine on *The Future of Food*. A public lecture given by Professor Richard Mithen *Kiwi science stories from the shopping trolley*, was attended by 236 individuals and led to an interview on Radio NZ. In addition, the HVN industry partner Ārepa was interviewed on the AM Show on Newshub regarding their research and future plans, which include HVN activities.

HVN activities in aquaculture generated particular attention, as this continues to emerge as a significant sector for industry. HVN also featured in media articles in Stuff.co.nz, Stuff.co.nz/Nelson Mail, Radio Waatea News, the Algae Industry Magazine, the Aquaculture New Zealand magazine, and Nutraingredients-Asia.com. HVN activities with Māori partners were highlighted in audio interviews with Waateanews.com and online in Nutraingredients-Asia.com.

HVN made a concerted effort this year to increase and update content regularly on its website. Social media engagement was increased, resulting in a doubling of followers on LinkedIn and an engagement rate comparable to, or higher than, other industry bodies, companies, and Crown Research Institutes. The HVN's Twitter account content also saw increased engagement this year.

HVN commenced its workplan to increase te reo on its website as part of a commitment to the principles of Vision Mātauranga. In addition, HVN completed an extensive review of its publications and updated the HVN website to reflect the significant number of outputs produced by its Priority Research Programmes.

HVN also produced videos showcasing the members of its Science Leadership Team and these are on the website. Professor Richard Mithen, HVN Chief Scientist, and Professor Clare Wall, Infant Health Priority Research Programme Principal Investigator, both gave their inaugural lectures at the University of Auckland. These lectures were attended by their academic colleagues, friends and family, and members of the public and were both very well received.

Public Awareness

In 2020 HVN also produced a quarterly e-newsletter, which has over 940 subscribers. Subscription has increased from 877 subscribers in June 2019, which is an increase of 63 recipients in the past year.

HVN sponsored the 2020 Sir Paul Callaghan Eureka! Awards for the first time this year. Robbie Maris from the University of Waikato student (pictured front row, far right) received the HVN Gold Scholarship at a prestigious gala dinner held at Parliament in Wellington in October 2020. Robbie's presentation - *What can seaweed aquaculture achieve?* - best identified the role that Science, Technology, Engineering or Mathematics (STEM) could play in developing high-value foods in Aotearoa New Zealand that have validated health benefits to assist consumers to stay healthy and well.



2020 Eureka! finalists pictured with Hon Andrew Little (Minister of Justice, for Courts, Workplace Relations & Safety, and Te Tiriti o Waitangi Negotiations) [Back row, third from the right] and Debbie Chin (Chair, Eureka! Trust) [Front row, third from the right]. Robbie Maris, winner of the HVN Gold Scholarship, is in the front row on the far right.



OUR GOVERNANCE & MANAGEMENT

Vision Mātauranga

HVN took substantial steps to improve its activities in support of Vision Mātauranga. An external panel of Māori thought-leaders, led by a Māori Chair, reviewed HVN's structure, governance, and policies. The panel made recommendations to the HVN Governance Board which are being implemented, while also taking into account guidance from Rauika Māngai's document *A Guide to Vision Mātauranga - Lessons from Māori Voices in the New Zealand Science Sector*.

The panel's recommendations prompted HVN to host a hui with leading Māori experts on Wai 262, Access and Benefits Sharing, and Mātauranga Māori. The hui was held to educate HVN researchers and Board members in preparation for increased engagement by Māori-owned F&B businesses with unique products. Following the hui, HVN has been actively evaluating structural and policy changes that will better support Māori participation and the appropriate use and management of taonga species, with a focus on recommendations that arose from the Wai 262 Report.

This year also saw increased participation of Māori in leadership and decision-making roles of HVN. The HVN Industry Advisory Panel welcomed the addition of Mahara Inglis (Nga Rauru Kitahi), CEO of MitoQ, while an internal review of HVN's structure, governance, and policies was led by Dr Charlotte Severne (Ngāti Tūwharetoa, Ngāti Tūhoe).

HVN continues to work on implementing recommendations made by Dr Severne and the assessment panel heading into 2020-2021.

Governance Updates

HVN completed the successful transition of its Board membership through Dr Alison Watters' appointment to the Board in August 2019. The appointment was based on a needs assessment of skills required to complement those already within the Board, with Alison bringing science expertise and strong governance skills.

The Board has strongly benefited from the hui held on Wai 262 and implications arising from the Tribunal report, with a much deeper focus on Access and Benefit Sharing requirements when taonga species are involved in HVN research. A Board strategy day was held in November 2019, and this identified the current direction of HVN is appropriate and delivering results. Some areas of greater focus relate to measurement and communication of impact and strategy and resource allocations.

In this light, HVN increased its communications resourcing by increasing the Senior Marketing and Communications Adviser Kristine Scherp's FTE allocation. HVN also welcomed Simmon Hofstetter to the Research Operations Manager's role after farewelling Nick Kearns in early 2020.

Ma tini ma mano ka rapa te whai

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

Host institution

