IMPACT REPORT 2024/25

Bioresource Processing Alliance

bioresourceprocessing.co.nz

WE HELP INNOVATIVE BUSINESSES CREATE VALUE.

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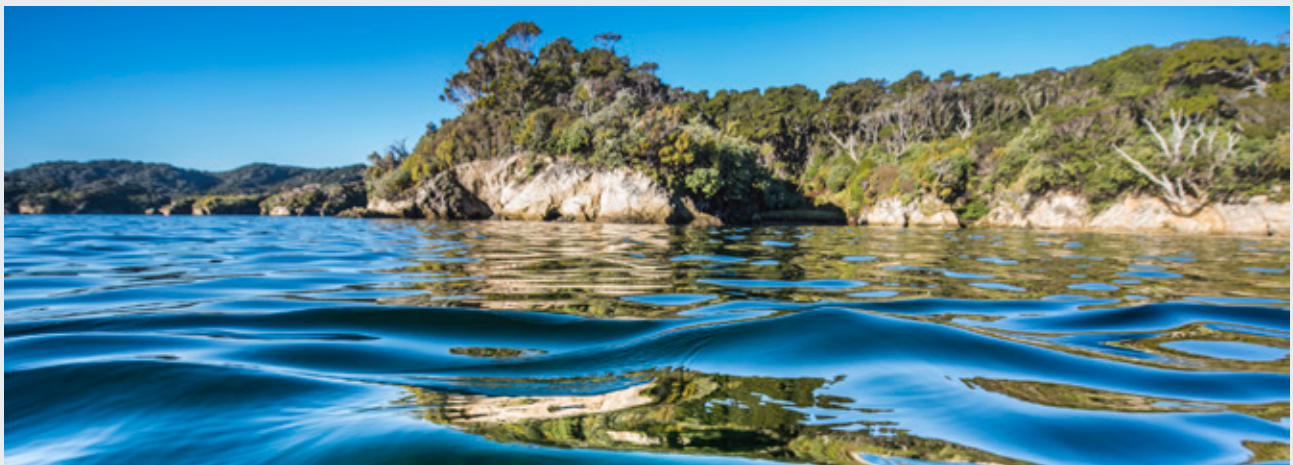
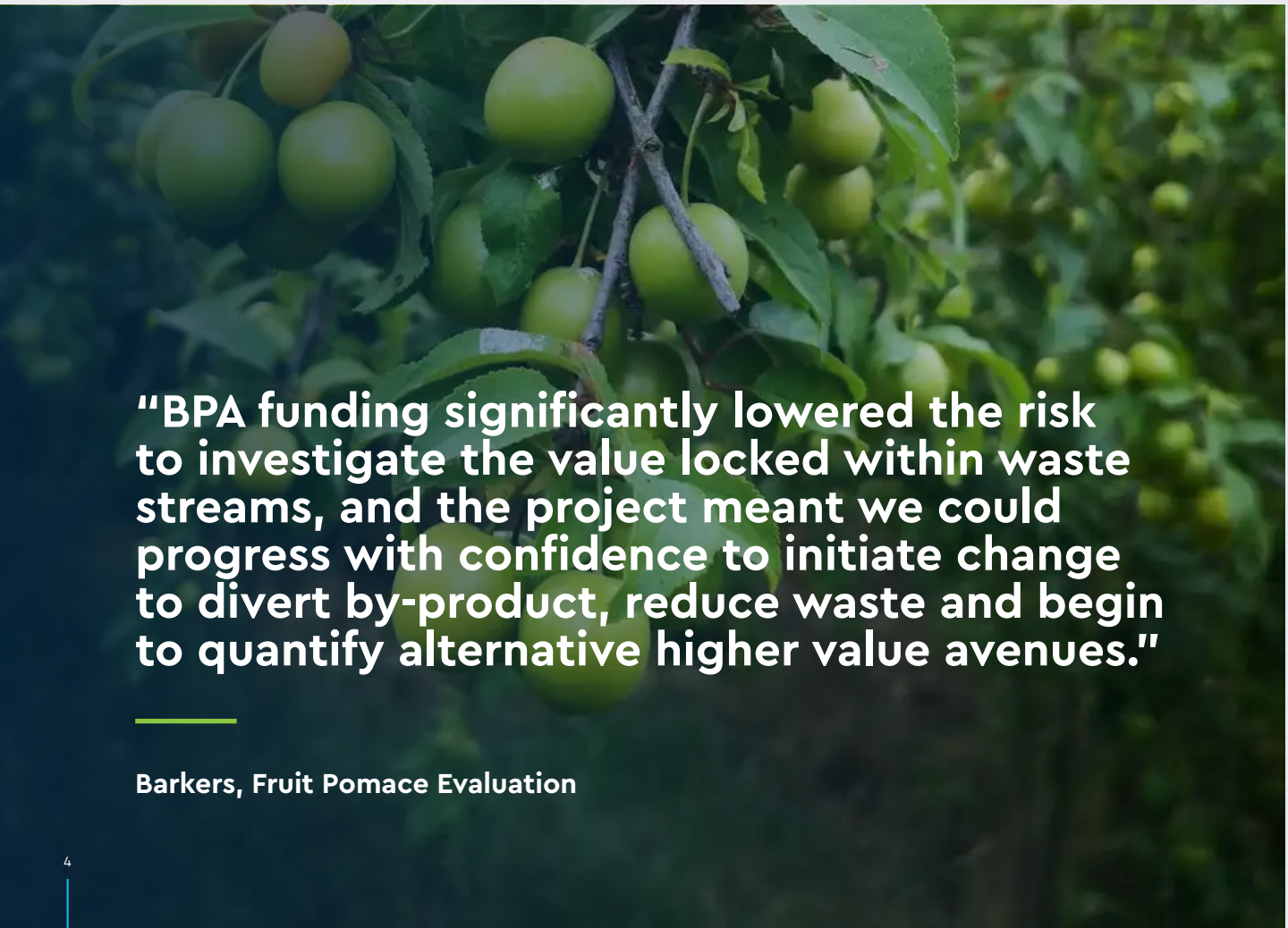


Our Values/ Mission Statement

We co-fund and undertake research and development projects with companies by using the expertise of our partners: (AgResearch, Scion, Plant & Food Research and Callaghan Innovation), along with universities throughout Aotearoa New Zealand.

We're funded by the Ministry of Business, Innovation and Employment (MBIE) to support value-add opportunities utilising low value biological resources. This includes raw materials derived from forestry, marine, agricultural, horticultural, animal and microbiological streams.

Through the transformation of low value biological resources, we aim to increase productivity, generate export revenue, and create environmental and social benefits for New Zealanders.



"BPA funding significantly lowered the risk to investigate the value locked within waste streams, and the project meant we could progress with confidence to initiate change to divert by-product, reduce waste and begin to quantify alternative higher value avenues."

Barkers, Fruit Pomace Evaluation

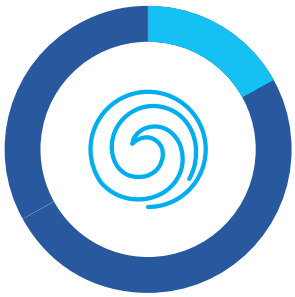
AS AN INNOVATION ALLIANCE, WE PIONEER SUSTAINABLE SOLUTIONS.

Our Impact Statistics

BPA funding by the numbers – highlights from 2024–25:

28 PROJECTS APPROVED

- 19 game-changing commercial ideas
- 9 student projects secured funding
  (eight student interns and one Master's student)



21% MĀORI AFFILIATED ENTITIES

34 NUMBER OF PROJECTS COMPLETED

The BPA funds multi-year projects

Total approved funding for commercial projects:

$1,592,000

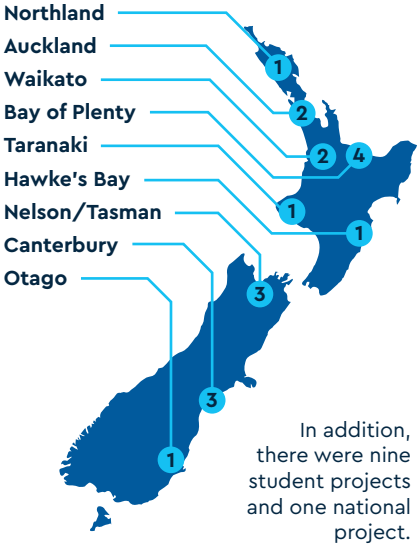
Total cash co-funding from industry partners in approved projects:

$516,000

Average funding per commercial project:

$84,000

REGIONAL SPREAD



In addition, there were nine student projects and one national project.

OUR GOAL IS TO GENERATE ADDITIONAL REVENUE FOR NEW ZEALAND BY WORKING WITH THE PRIMARY SECTOR.

Innovation in Action

Driving New Zealand's Bioeconomy

This year, we are highlighting two innovative businesses that have recently wrapped-up BPA-funded projects; one established business and one start-up. The BPA is proud to support businesses at every stage, and to work with industry to de-risk investment in innovation.

New Zealand King Salmon

New Zealand King Salmon was looking for ways to convert its salmon by-products into higher value products, including the Omega Plus pet food range.

With the assistance and support of the BPA, the Omega Plus team worked with scientists from AgResearch and Massey University to work out the right processing method to achieve optimum palatability for cat and dog treats.

Omega Plus pet food contains King Salmon as the key ingredient, and is a great source of Omega-3 fatty acids and highly digestible proteins. It supports joint mobility, heart, brain, skin and coat health, and immunity.

Since launching the brand in 2016, Omega Plus has expanded sales to include New Zealand specialty retail outlets including Animates, Petstock, and select veterinary clinics.

They are also selling their products into the United States and China, with additional export opportunities into Australia underway. Another BPA-supported project is currently in progress to test the digestibility of its various recipes with the expertise and support of Massey University's Canine and Feline nutrition labs.

For more information on Omega Plus, go to **www.omegaplus.co.nz**

"BPA provides an incentive to invest in R&D... and opens eyes to the value of full utilisation and maximisation of resources."

Julien Stevens – R&D Manager, NZ King Salmon

2026

Future Plans

- Business case and potential implementation of oil and protein plant to boost maximisation of resources, full resource utilisation
- Expanded exports – various markets

2025

2025 – Scaling & Collaboration

- New processes via BPA walkthrough
- Research and development underway for future oil and protein plant to boost maximisation of resources, full utilisation of resources
- Exploring US export potential amid supply challenges

2024

2024 – Early Outcomes

- Diverted ~40% of organic material from waste water, maximising value and reducing costs for the business
- Launched Omega Plus oil/treats into veterinary markets with positive economic impact for the business
- Added part-time sales FTE

2023

2023 – BPA Funding Awarded

- Funding for Omega Plus oil/treats & waste diversion

2023 – Pre-Funding Challenges

- 52–55 MT organic material to waste water, costing ~$250k/yr
- Constraints on R&D budget/ investment

KEY: Environmental Economic Innovation Collaboration

Mīti™

The Mīti project has been a breakthrough for Alps2Ocean Foods, demonstrating that young dairy-derived beef can be transformed into a premium, shelf-stable, nutrient-dense food with a significantly lower on-farm carbon footprint than traditional beef.

All the science supported through the BPA has been instrumental in validating this proposition and positioning Mīti as a world-first in sustainable protein innovation.

The success of this project proves that surplus non-replacement dairy calves can form the basis of a high-value circular economy export sector, unlocking a billion-dollar opportunity for New Zealand's food and farming future.

For more information on Mīti, go to **www.miti.nz**

"Crucially, BPA funding enabled us to bring together a coalition of aligned partners across the red meat, science, and sustainability value chains. This collaboration would not have been possible without the project support and has de-risked our next stage of scale-up, including manufacturing trials and investor engagement."

Daniel Carson – Mīti

2026

2026+ – Future Plans

- Export to global markets, new functional formulations
- Capital raise

2025

2025 – Scaling & Collaboration

- Export partnership in negotiation
- Winner Early-Stage Innovation Award and People's Choice Award at Fieldays 2025
- New flavours for consumer feedback launched
- World-first nLCA science released to show Mīti production system and finished product superior to soy-based protein competitor

2024

2024 – Early Outcomes

- First scale manufacturing and online launch
- Lowest carbon footprint published of any beef production system globally

2023

2023 – BPA Funding Awarded

- Industry collaboration through BPA funding: Pāmu, Fonterra, Alliance Group, Duncan Venison, Mt Somers Station, SPCA, AgResearch, Alps2Ocean Foods
- Funding for life cycle analysis and research into nutritional health benefits

2023 – Pre-Funding Challenges

- Cash-flow constraints limited R&D for low-carbon meat snacks
- Lack of significant external collaborations for R&D

Note: Not all outcomes can be derived solely from BPA funding

How we work

From consultancy, research and development through to pilot plant trials and commercialisation, the BPA aligns the appropriate research team with each project.

We co-fund industry-led R&D projects that utilise raw materials derived from forestry, marine, agricultural, horticultural, animal and microbiological streams.

Applications can involve multiple research organisations, depending on what expertise and equipment is required. Once the application is submitted, it is reviewed by a small team of science leaders. They make a recommendation to the BPA board, which holds the final decision-making authority.

All applicants must work with one (or more) of our R&D partners to submit a proposal.

Applications can only be submitted via a BPA R&D partner (AgResearch, Scion, Plant & Food Research and Callaghan Innovation) or a university.

To be eligible for funding, projects must:

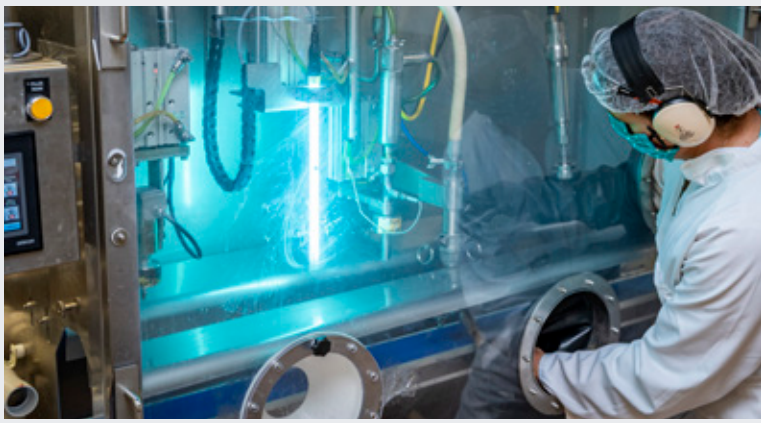
- Add value to, or create value from, an underutilised biological resource
- Be led by a BPA R&D partner (AgResearch, Scion, Plant & Food Research and Callaghan Innovation) or a New Zealand university
- Involve an industry partner who can make a cash and in-kind contribution to the project
- Have clearly identified economic, environmental and/or social benefits

Before submission, applicants must ensure that:

- All parties have signed the proposal
- All the required fields have been completed
- There is a clear project plan, with defined time frames for deliverables and clear criteria for any go/no-go decisions
- All parties are clear about the IP arrangements, and understand the BPA's guiding principles with regard to IP

There are two project categories:

- **Commercial projects** generally involve companies and have cash and in-kind contributions from these companies.
- **Student projects** can be internships or Master's projects. Interns can be sponsored by a business or a BPA R&D partner, but if hosted by a business the student will need to be supervised by a relevant BPA R&D partner. Post-doctoral projects may be considered but please check with the BPA first.



Message from the Chair

As I reflect on my first year as chair of the BPA board, I would like to acknowledge the enormous legacy left by the previous chair, Garth Carnaby. Garth chaired the board of the BPA from its inception and was a committed and passionate advocate for the BPA and the opportunities it created for the industry and research sectors to work closely together. I have been extremely fortunate to pick up the mantle of such a well-run and well-regarded initiative, with a great reputation.

The last year has presented an interesting mix of opportunities, challenges and change as we navigate the transitions underway for the BPA partner organisations. We are grateful to have had clarity that the BPA will continue as a standalone entity, and we look forward to our new home within the Bioeconomy Science Institute.

The Sustainable Solutions Symposium was an excellent opportunity to reflect on the impact that the BPA has made through its contribution to such an enormous range of innovative industry projects over the years. It highlighted that the waste to value goal of the BPA has resonated with both industry and the science sector, and the buzz and collaborative atmosphere of the event was really inspiring. Such was the enthusiasm that we have committed to hosting another symposium in 2026.

We are fortunate to have a deep bench of talent and expertise on both our Science Leadership Group and board, providing research support, guidance and scientific skills to guide innovative thinking into commercial, scalable opportunities. It is a privilege to work alongside such committed, experienced and passionate people, and I thank them for their commitment, drive and wise counsel. Nicky Solomon, our general manager, has steered the BPA to new heights over the past year, with growing numbers of funding applicants, completed projects and a greater awareness of the benefits of collaboration in research and development.

This collaboration was recognised by Science New Zealand with the Collaboration for Impact award, given for leading the way in transforming biological by-products into high-value commercial solutions, reducing waste and driving investment and job creation. The impact of science is truly amplified through collaboration.

Congratulations also to board member Susan Marshall, principal scientist at Plant & Food Research, who was recently named as one of new Ngā Ahurei a Te Apārangi Fellows elected to the Academy of the Royal Society Te Apārangi. Being made a Fellow is an honour that recognises distinction in research, scholarship, or the advancement of knowledge at the highest international standards, and we all stand to benefit from Sue's generous knowledge and innovative thinking.

As the BPA's mission grows ever more important for New Zealand with each passing year, I encourage you to spread the word about how the BPA can help turn primary sector co-products into commercially successful high added value products. Not only does this boost New Zealand's economic growth, and contribute to the government's goal of doubling the value of exports by 2030, but it makes the primary sector more sustainable and assists in its highly valuable support of the standard of living in New Zealand.

In conclusion, I would like to acknowledge the funding from the Ministry of Business Innovation and Employment (MBIE) that makes all this possible. Thank you, Hon Dr. Shane Reti, Minister of Research, Science and Technology (RS&T), and MBIE for your trust in the BPA's unique model and talents. It has paid dividends for New Zealand.

Max Kennedy
Board Chair

Our People

Science Leadership Group

The Science Leadership Group is made up of industry experts from across our alliance. They review proposals for funding and support in the first instance, and make their recommendations to the board for final approval.

Christophe Collet, Scion

Christophe is a Senior Industrial Biotechnologist, Microbial Biotech Team Leader at Scion in Rotorua. His current research area focuses on using biomass resources available in New Zealand, including wood waste, dairy waste streams, other agro-industrial waste streams, industrial gases containing CH4 and/or CO2, to produce value-add materials, such as Single Cell Protein (SCP), bioplastics like PHA (PolyHydroxyAlkanoate), bio-composites and Synthetic Biology products, using microorganisms, as well as process development and scale-up in bioreactors.

Stewart Collie, AgResearch

Stewart is the Science Team Leader for the Bioproduct and Fibre Technology Team in the AgResearch Group of the Bioeconomy Science Institute. His background is in wool and textiles, but the current research activities of the team include a range of bio-based material formats and processes, especially protein based materials coming from secondary resource streams from the agriculture sector.

Richard Edmonds, Plant & Food Research

Richard is a Senior BioProcess Engineer and a member of the Food and Products Technology group at Plant & Food Research. His focus is on plant protein processing and the use of techno economic analysis to tie concepts together to produce viable commercial outcomes. Prior to joining Plant & Food Research in 2018, Richard was a research scientist with the Leather and Shoe Research Association. He has a PhD in BioProcess Engineering, entitled "Proteolytic depilation of lambskins".

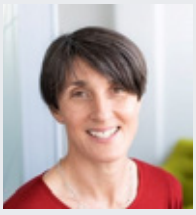
Stephen Tallon, Callaghan Innovation

Stephen is a senior scientist at Callaghan Innovation in the Biotechnologies group. He leads a team of process and biotech engineers specialising in developing new products and processes in the food and natural products industries. The team operates a pilot product development suite for rapid assessment and development of opportunities, from concept through to small scale manufacture. Specialist subject areas include the use of pressurised and supercritical solvents, separation processes, and enzymatic transformation. He also has expertise in process design, feasibility assessment, and hazard assessment.

The BPA team: Back row: Richard Edmonds, Marc Gaugler, Owen Catchpole, Peter Gostomski. Middle row: Stewart Collie, Stephen Tallon, Christophe Collet, Katy Bluett, Stefan Clerens. Front row: Ian Raynor, Francene Wineti, Nicky Solomon, Robert Blache (Product Manager, Callaghan Innovation), Susan Marshall, Max Kennedy

Management

Our General Manager maintains links between the BPA, our R&D partners, industry and the innovation sector. She provides funding advice and support in developing project ideas and submitting applications. The General Manager is supported by the project co-ordinator who provides expertise in operational delivery, project contract administration and management.



Nicky Solomon, General Manager

Nicky joined the BPA as General Manager in August 2023 and also works part-time for the NZ Food Innovation Network. Nicky has a PhD in Food Science and is the chair of the board of Foodeast Haumako and a member of the NZ Food Safety/ Haumaru Kai Aotearoa Advisory Board.

Ian Raynor, Callaghan Innovation

Ian has served as the Product Coordinator at Callaghan Innovation (the host organisation for the BPA) since 2022. In this role, he provides support to the BPA General Manager, board, and Science Leadership Group, including operational delivery, project contract administration and management. Ian brings extensive experience as a Project Coordinator, having held similar roles over many years at Callaghan Innovation and its predecessor organisations.

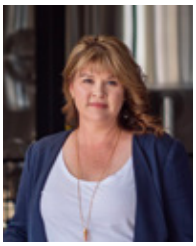
Our Board

Our board of directors governs the BPA's performance, makes funding decisions, and provides strategic direction.

Max Kennedy, Chair

Max is a biochemical engineer specialising in fermentation and is the Managing Director of consulting company, Biolighthouse Ltd. Previously, he was Manager of Contestable Investments at the New Zealand Ministry of Business, Innovation and Employment (MBIE), responsible for Research & Development supporting transformative economic, environmental and social outcomes for New Zealand. Max also led MBIE's COVID Innovation Acceleration Fund to support research to respond to the COVID-19 pandemic. Max has also worked in pharmaceutical sector, manufacturing ingredients by fermentation and has had governance roles in science based research platforms. He was appointed as Chair of the BPA in September 2024.

Katy Bluett, Independent Board Member



Katy is an experienced food industry professional. Through bespoke consulting services in her business Appetite for Change, she supports ambitious businesses to innovate, commercialise and grow faster. She is also Executive Director of Future Food Aotearoa, a founders movement formed in 2020 to accelerate the growth and impact of food tech businesses from New Zealand. Katy has worked in a variety of local and international leadership roles across top FMCG, ingredients and technology companies, launching over 1000 F&B products along the way. She has also led the F&B sector for Callaghan Innovation, the Government's Innovation agency, working with more than 400 of NZ's most innovative and promising F&B businesses, fuelling her passion for food systems transformation.

Owen Catchpole, Callaghan Innovation

Owen is the Chief Engineer for the Biotechnologies Group of Innovation Expertise, a business unit of Callaghan Innovation. The group specialises in the application of bioprocessing to biologically derived raw materials to make high value nutraceuticals, food ingredients and biopharmaceuticals. His work has resulted in various awards, including a Royal Society NZ Science & Technology Silver Medal, the NZIC Fonterra prize for Industrial and Applied Research, the R J Scott Medal, the SNZ 'Collaboration for Impact' Award for the BPA, and election as a Fellow of Engineering NZ and the Royal Society Te Aparangi.

Stefan Clerens, AgResearch

Stefan is Science Group Manager of Smart Foods & Bioproducts at AgResearch. Its capabilities include microbial food safety and shelf life, flavour and aroma profiling, dairy and meat processing, non-invasive sensing, fermentation, gut health, behaviour and cognitive wellbeing, consumer understanding and emerging proteins. Stefan received his PhD from the University of Leuven (Belgium) in mass spectrometry of biomolecules. He is a member of the Riddet Institute Partner Reference Group, the New Zealand Synchrotron Group and the Canterbury Joint Postgraduate School Food Transitions 2050.

Marc Gaugler, Scion

Marc is a chemical engineer, and heads up Scion's Distributed and Circular Manufacturing Portfolio, part of its Materials, Engineering and Manufacturing Group. His current research area focuses on using biomass resources available in New Zealand to produce value-add materials, such as bioplastics, composites and biochemicals from woody biomass. He started his professional life developing and identifying bio-based plastics additives, and then moved into plastics product and processing development.

Peter Gostomski, University of Canterbury

Peter is a Professor of Chemical & Process Engineering at the University of Canterbury. His research interests are in bioprocess engineering, looking at both the production of biochemicals and environmental biotreatment technologies. Specific projects that he is actively working on include biofiltration, denitrification and microbial fuel cells. He has held various leadership roles including Head of Department, acting Executive Dean of Engineering and acting Deputy Vice-Chancellor Research. He is a Fellow of both IChemE and Engineering NZ.

Susan Marshall, Plant & Food Research

Sue is Principal Scientist for Seafood Processing and Marine Products in the Plant & Food Research Group of the Bioeconomy Science Institute. Her work focuses on optimised utilisation of marine biomass through development of foods, nutraceuticals, and biomaterials; the industrial processes needed to make them; and the application of new analytical technologies for real-time process monitoring. She is particularly interested in bridging the gap between laboratory science and large-scale manufacturing, with an emphasis on zero waste, and 'green' processing solutions to reduce energy and chemical use. Sue was made a Fellow of the Royal Society Te Aparangi in 2025.

Francene Wineti, Independent Board Member

Te Atihaunui-a-Paparangi, Ngati Tuwharetoa, Ngati Rangi, Ngati Kahungunu ki Wairoa.

Francene is owner and director of Awariki Limited, delivering specialised services on kaupapa Māori research and development and Māori cultural capability. Her areas of expertise include fisheries, aquaculture, agribusiness, agrifood, science and innovation, and iwi/Māori economic development. She holds a number of governance roles including Director of Ngāti Tuwharetoa Fisheries Limited, Hautaki Trust and Trustee of Te Huarahi Tika Trust – the Māori Radiospectrum Trust and Te Ara Pōtiki Trust – an indigenous global knowledge exchange programme in the agri-food sector.

Message from the General Manager

It has been another great year for the BPA, as we further develop our processes and refine our strategy in preparation for our transition to the new Bioeconomy Science Institute.

It is testament to the recognised value of the BPA that it was identified by Cabinet as part of the science system that should continue in a business-as-usual fashion.

The BPA is a demonstrated model for a collaborative approach to the delivery of research that fills an industry need and as such fits well with the purpose of the Bioeconomy Science Institute.

A highlight of the year for me was our inaugural Sustainable Solutions Symposium held in Nelson. Our goal was to bring together industry and R&D providers to share experiences and challenges, raising awareness of the BPA and how it can support businesses to create additional economic value from biological resources. There was such a great sense of community and shared purpose in the room – it was incredibly inspiring to be part of it! Huge thanks to the extended BPA team for the enormous amount of hard work and support that made the day such a success, and to our speakers – the power of shared stories is second-to-none.

Thanks to Max Kennedy who provides our board with excellent leadership and guidance and provides me with a huge amount of support, encouragement and advice, which I greatly appreciate. The ongoing support from the Science Leadership Group and the board is hugely valuable to me, and I really appreciate the commitment of all of the BPA team and the calibre of thinking and debate from which we all benefit.

I am also hugely grateful for the ongoing support from my colleagues within Callaghan Innovation, who have been steadfast and committed, despite uncertain times.

Looking ahead, the coming year will bring change, and with that opportunity, and I'm confident that the BPA is in excellent shape to deliver meaningful and ongoing impact for Aotearoa New Zealand.

It is heartening to observe the ongoing commitment from industry to innovation to create economic value and improve sustainability credentials, despite an extremely challenging environment for business. With thirty-four projects completed this year, the cumulative impact of the BPA since its inception is remarkable, and I am very proud to be part of such a focused and valuable initiative.

Nicky Solomon
General Manager

WE PROVIDE FUNDING SUPPORT FOR PROJECTS THAT UTILISE THE EXPERTISE OF OUR RESEARCH PARTNERS.

BPA community strengthened by inaugural Sustainable Solutions Symposium

Sustainable Solutions Symposium

We hosted our first Sustainable Solutions Symposium in Nelson earlier this year, highlighting the value that businesses can extract from their resources and processes by tapping into the expertise of our research alliance.

Being our first symposium, we weren't sure what the level of interest would be, and we were absolutely delighted to host more than 120 people for an incredible day in which the value of common goals and shared learnings was apparent.

Melissa Clark-Reynolds, ONZM, visionary and certified futurist, delivered the keynote address at the event, and there were some great presentations from some of the companies that the BPA has worked with, including Cetogenix, Ecogas, Good Grub Agritech, Mīti, NZ Extracts and NZ King Salmon.

Feedback on the symposium was extremely positive, and participants were keen to see us host another symposium in 2026. The consensus was that the symposium created a real sense of community, which is of great value and worth nurturing, so we look forward to hosting again in May 2026 in Rotorua.

The overwhelming majority of our participants – 96.8% said they would attend again.

Here are some of the comments shared in our feedback survey:

"This is one of those events you didn't know you needed in your life. So inspirational and a great pick me up to reset the brain and direction."

"To hear the experiences and talks of the industry partners was exceptional."

"It was great to see the success stories and understand the hurdles that they have overcome."

"Loved the showcase studies and interactive session."

"It was inspiring to see how high a regard the BPA is held by people who have worked with the organisation for a number of years."

"It was great to see what R&D is being undertaken at the moment and the enthusiasm with which each venture is being tackled."

Case Study:

Turning dairy byproduct into pet food gold – a sustainable breakthrough

In a pioneering effort to boost sustainability and reduce product loss, researchers from Yili Innovation Center Oceania, National Technology Innovation Center for Dairy, Oceania Dairy Limited and Westland Milk Products have transformed an overlooked dairy byproduct—DAF sludge—into a high-value, digestible protein source for pet food.

DAF sludge, or Dissolved Air Flotation sludge, is a byproduct in dairy processing. Traditionally low-value, it is now being upcycled into a hydrolysed protein ingredient rich in essential amino acids.

The three-year project has been supported by R&D teams at Callaghan Innovation and AgResearch, with $205,000 of funding from the BPA provided at three key points on the project timeline.

"This is a win-win for both the environment and the industry," says Dr Philip Wescombe, development team member at the Yili Innovation Center Oceania, Lincoln University.

Using a proprietary process, the development team extracted an 80% protein powder from DAF sludge, which testing showed to be highly bioavailable and suitable for canine nutrition. A feeding trial confirmed its safety and digestibility, with a bioavailability of over 96%—well above plant-based proteins, which average between 74–78%.

"It's high in branched-chain amino acids, which are great for muscle synthesis, and it's particularly rich in methionine, which supports healthy skin, coat, and urinary function in dogs," says Dr Wescombe.

In addition to nutritional advantages, the innovation has significant environmental and economic benefits. The new process utilises 84% of the total solids in the dairy byproduct, helping reduce the volume of total solids sent to landfill and cutting associated emissions. Financially, the protein ingredient is projected to generate more than US$3,000 per metric tonne for dairy producers—turning a disposal cost into a profitable stream.

This breakthrough also extends beyond pet food. Preliminary research also explored using the extracted protein to create hydrogels—materials with potential uses in adhesives or controlled-release systems—demonstrating the protein's versatility.

"This kind of work is where science and sustainability meet commercial reality," says Dr Wescombe.

"It would not have been possible without the support of Callaghan, AgResearch and the BPA who have been with us from the start, providing expertise, research capabilities and funding at crucial points of the project."

For more information on Oceania Dairy, go to **www.oceaniadairy.co.nz**

Case Study:

Discovering unique health benefits from natural fruit extracts

new zealand extracts limited
PREMIUM NZ BIO-ACTIVE EXTRACTS

Blenheim-based New Zealand Extracts is the only company globally producing highly bioactive ingredients from locally grown fruits and plant materials using an in-house water developed extraction process.

Their ingredients, which come in a highly concentrated, soluble powder form, are used in products ranging from supplements to personal care and immune boosters, in partnership with companies across Asia, Australia, Europe, North America and New Zealand.

Grape seed extract, the company's flagship product, has been proven to have anti-inflammatory properties that may reduce risk of diseases such as cancer and neurodegenerative disorders.

When Mike Turner was appointed CEO in 2013, NZ Extracts was struggling to get research funding to identify the key antioxidant components in the extract, and the functional benefits it delivered.

To meet these challenges, the company partnered with Plant & Food Research and Callaghan Innovation, leading to support from the Bioresource Processing Alliance (BPA).

The BPA was drawn to the project's waste-stream focus and local production model.

In November 2021, the BPA provided a $149,000 grant to enhance processing design and support clinical research. A second grant of $196,000 in August 2022 helped scale up development and validate findings for international scientific publication. Key outcomes from the research highlighted opportunities for process improvements; while at the same time confirming that the grape seed extract had a unique composition and delivered a modulating immune response.

In December 2022, the business was acquired by a Japanese partner, with Mike Turner continuing to provide technical and management support. In collaboration with Tokushima and Kyoto universities, the partner had previously been conducting its own research into the benefits of the grape seed extract in reducing various side effects associated with chemotherapy drugs and dosage levels in cancer treatment.

Since the acquisition, significant investment has been made in Blenheim's production site, including increased extraction capacity and the installation of a high-end freeze-drying facility allowing the business to produce the extracts under one roof.

"Our research has also shown to the world that we do have a unique grape seed extract," says Mike.

"This is particularly important in a highly competitive global market," he says. "Commercially, with proven science, it's possible that our grape seed extract could command more than USD $200/kg in a market of around 3,000 metric tonnes.

"All credit to the BPA, Plant & Food, and Callaghan Innovation," says Mike. "We couldn't have done it without them."

For more information on New Zealand Extracts, go to **www.nzextracts.com**

Case Study:

From stage to science: BPA supports Darius Martin-Baker on his journey

Darius Martin-Baker, Ngāpuhi (Waimā and Ngāwhā), is as comfortable treading the boards as he is pioneering research into the medicinal properties of kūmara vines.

The 21-year-old Northlander performed in King Lear at London's iconic Globe Theatre as part of a special performance by the Young Shakespeare Company three years ago and then went on to head up social enterprise Youth Arts New Zealand, reflecting his dedication to empowering rangatahi and fostering environments where cultural identity and innovation sit side by side.

It was his sister's desire to find a traditional cure for a niggling stomach problem that first piqued Darius' interest in developing a protein-based drink derived from the kūmara plant, believed to have been introduced to New Zealand by Polynesian settlers in the 13th century.

His sister, a practitioner in rongoā Māori, or traditional Māori healing, had pointed out the health properties of a rampant kūmara vine she had growing inside, which led Darius to look more closely into the value-added potential of the vine, the above-ground portion of the kūmara plant.

With an annual production of nearly 200,000 tonnes of kūmara going unused, Darius' goal was to unlock the potential of the vines by identifying bioactive compounds with anti-carcinogenic, anti-cardiovascular disease, and anti-diabetic properties – based on a research paper released by the University of Arkansas.


Darius Martin-Baker

"My expectations are also based on mātauranga (Māori knowledge) passed down from my whakapapa," says Darius, who has also chaired the Whangārei District Council Youth Advisory Group and was recognised for his rangatahi leadership skills in Te Tai Tokerau Māori Business Awards.

"A large part of why I'm doing this is to whakamana (empower) the mana of rongoā among the general public, and to normalise the use of plant-based health products as a key part of Māori-based healing."

Through rigorous analysis being conducted by a team of Callaghan Innovation scientists and a $70,000 grant from the Bioresource Processing Alliance, Darius is aiming to determine the protein and amino acid concentrations within the vines, develop an efficient extraction process for these bioactive compounds and formulate a protein-based beverage. This would be used to support cancer patients, and those with diabetes and cardiovascular diseases, as well as serving as a general protein supplement for everyday use.

Darius is very excited about the previously untapped potential of the vines, both to help support communities around the Kaipara district – one of the main kūmara-growing regions in the country – and to support the hauora (health) of those people who use it.

Case Study:

Upcycling a mass crop to produce alternative protein products

Hawke's Bay-based Kabocha Innovations produces Kabocha Milk, a high-quality vegetable milk made by upcycling waste kabocha, or winter squash (also known as Japanese pumpkins).

High in Vitamin A, the milk can help to lower cancer risk and also supports eye health. The award-winning product is sold in multiple stores throughout Japan and Hong Kong.

Kabocha is a very fast-growing crop, and the company was keen to explore maximising all parts of the waste and second-grade fruit stream with pumpkin production generating 15,000 tonnes of waste (which goes to stock food) and 3,000 tonnes of seeds each year.

Since late 2022, it has been working with research scientists and innovation specialists at Callaghan Innovation on developing further products from the kernels, including a protein-rich kabocha powder.

Founder & CEO Shane Newman says they were keen to understand how research expertise would help secure funding for process and product development, and the input from Callaghan was invaluable.

The company received $100,000 in funding from the BPA in 2022 to further progress the development of the high protein powder in a laboratory scalable form, looking at its use in alternative protein meat patties and oils.

With success in the lab scale trials, Kabocha Innovation secured a second round of funding in 2023 to conduct small scale commercial trials with the view to expanding to a larger commercial setting.

A third round in 2024 has been earmarked for the production of specific products for customers.

Powder extraction at scale requires custom-built machinery, and the company is looking towards a future capital raise to develop a pilot plant outside Wellington.

"It's a fully upcycled piece of fruit," says Shane.

"Before this process, we didn't know that a funding mechanism for science existed, so to have this opportunity and support from the BPA has been really amazing."

For more information on Kabocha, go to **www.kabochainnovations.co.nz**

Student Case Study:

From lab bench to longline: My journey developing the sea sausage

Jerome Chua – Master's Student

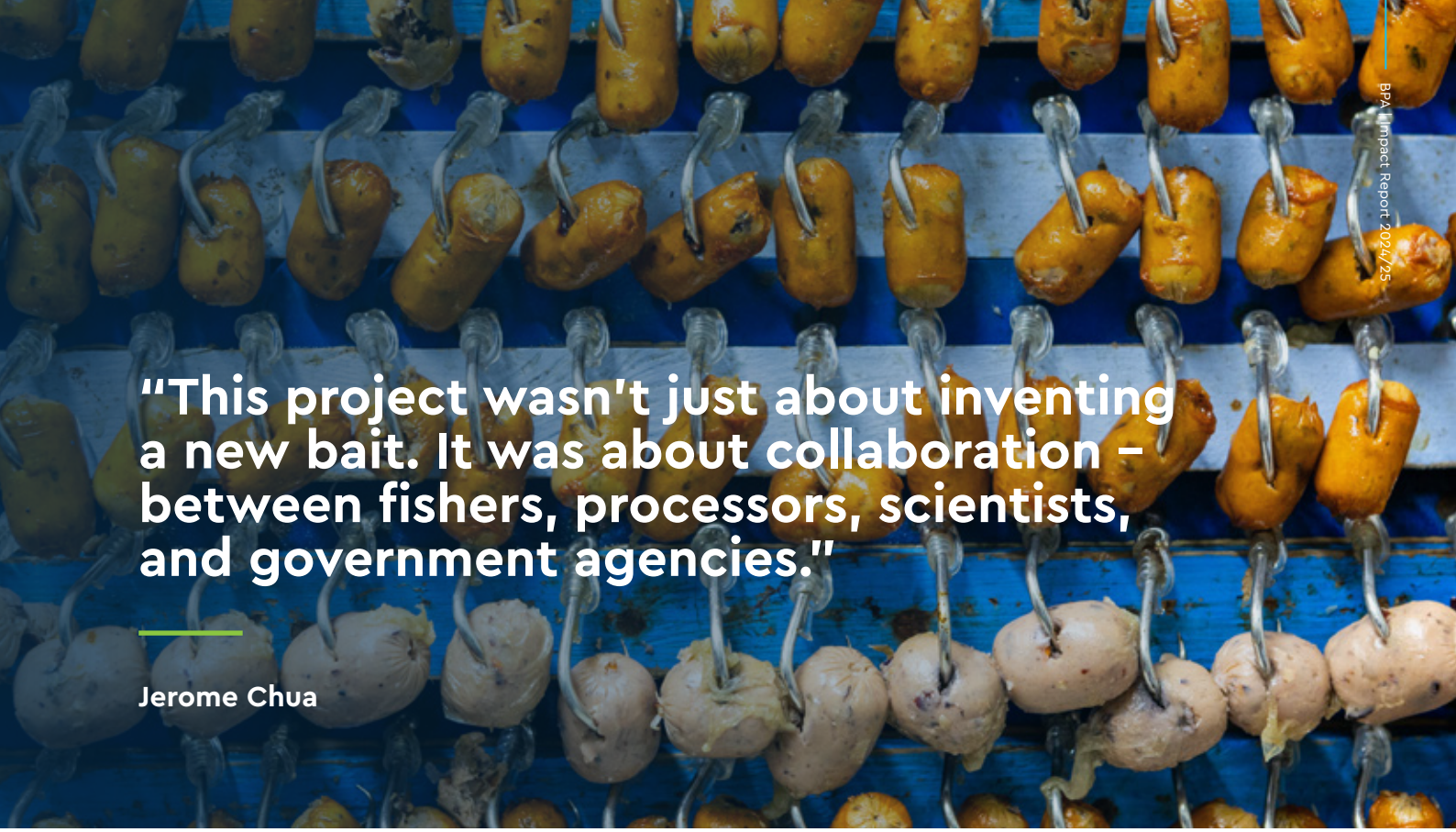
As a graduate of Singapore Institute of Technology – Massey University joint Bachelor of Food Technology, I never imagined I'd end up on a fishing vessel off the coast of Taranaki, while undertaking a master's in food technology. But that's exactly where I found myself- alongside Rob Ansley, skipper of Layla and managing director of Ocean Pearl Fisheries, testing a bait I helped design: the crayfish sea sausage.

It all started when Rob and Keith Mawson from Egmont Seafoods approached Massey looking for a solution. The rig fishery in Taranaki had a challenge. Traditional methods like set nets and trawling had been pushed further off the coast to protect Māui dolphins, and longlining—more dolphin-friendly—was proving less effective. Rig, also known as lemon fish and very popular as a fish-and-chip fish, just weren't taking the hook.

Rob had tried crab and crayfish legs as bait. While rig clearly loved cray, the bait disintegrated quickly in seawater and required labour-intensive preparation for the baiting process. That's when I was brought in, with this project opportunity having been advised to recent Bachelor's graduates. With a background in food formulation, I saw the challenge not just as a fishing problem—but as a material science puzzle.

Could we turn crayfish waste—specifically from Fiordland Lobster Company—into something durable enough to stay on a hook, yet still appealing to rig? Over eight months, I developed what we have called the sea sausage: a compact, protein-rich bait held together with a proprietary binder system. It is durable, easy to use, and—most importantly—attractive to rig.

Master's student Jerome Chua



"This project wasn't just about inventing a new bait. It was about collaboration – between fishers, processors, scientists, and government agencies."

Jerome Chua

When we first tested it, I was cautiously optimistic. Rob, too, was sceptical—worried the bait wouldn't appeal to the fish. But within hours of the trial starting, we saw results. The rig were biting. "We're away," Rob said, grinning. That was the moment I knew we'd created something special.

The sausage doesn't just work—it's sustainable. It uses crayfish parts that would otherwise go to landfill (due to how mortalities within a live capture industry need to be dealt with). Using alternative baits reduces reliance on traditional bait stocks, helping to conserve these resources. Additionally, it maintains the ecological balance by keeping rig populations in check, benefitting crayfish fisheries, as rig predate on crayfish in the wild.

This project wasn't just about inventing a new bait. It was about collaboration—between fishers, processors, scientists, and government agencies. The Ministry for Primary Industries supported our trials, the Bioresource Processing Alliance (BPA) helped fund the research, and the Venture Taranaki-Massey University partnership helped connect the dots.

I'm proud to have contributed not only to the science but to something with real-world impact—helping protect our marine life while keeping fish on our plates.

Photos courtesy of Seafood New Zealand.

Jerome Chua and Rob Ansley, skipper of Layla and managing director of Ocean Pearl Fisheries

The crayfish sea sausage

Our Partners

We oversee an innovative R&D programme which is delivered through an alliance of our four research partners: Scion, Plant & Food Research, AgResearch and Callaghan Innovation, along with universities throughout Aotearoa New Zealand.

By leveraging specialist skills and capabilities from across these research organisations and others in the innovation ecosystem, we're able to support a range of projects to transform low-value biological resources into higher value products.

Plant & Food Research
Rangahau Ahumāra Kai

Plant & Food Research specialises in research and development related to fruit, vegetable, crop, seafood and food products. It has key expertise in marine and horticultural biological resource streams, low impact processing technologies especially enzymatic biotransformations, and extraction platforms and bioassays.

www.plantandfood.co.nz

agresearch
āta mātai, mātai whetū

AgResearch provides scientific research and development to New Zealand's pastoral sector and specialises in meat, dairy and animal fibre co-products, including expert knowledge in pre-processing, handling and product development with potentially difficult materials.

www.agresearch.co.nz

Callaghan Innovation
Te Pokapū Auaha

The Callaghan Innovation Biotechnologies Group offers engineering expertise and capability in process design and product development at pilot and small manufacturing scale. Technologies include solvent extraction, supercritical fluid processing, separation technologies, drying/dewatering and bioprocessing. Its scientific capability covers complex lipid analysis, protein and enzyme science, fermentation bioprocessing and natural product analysis, supported by a world-class suite of analytical equipment.

www.callaghaninnovation.govt.nz

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Scion is New Zealand's leading institute in forestry, industrial biotechnology and advanced manufacturing. It drives innovation and growth to create economic value and contribute to beneficial environmental and social outcomes. It provides science, technology and innovation for the development of products and processes that replace petrochemicals and non-sustainable materials with alternatives derived from sustainable feedstock.

www.scionresearch.com

Universities and other tertiary institutions

We also work with universities and tertiary institutions in Aotearoa New Zealand by offering undergraduate (internships) and graduate (Master's) sponsorship to support our mission. Support for Master's programmes includes a stipend, student fees and a contribution towards direct costs. More information on funding opportunities for students is available at our website.

www.bioresourceprocessing.co.nz

WE HELP INNOVATIVE BUSINESSES CREATE VALUE.

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Bioresource Processing Alliance

bioresourceprocessing.co.nz