October / November 2024

Food New Zealand

NZ'S AUTHORITY ON FOOD TECHNOLOGY, RESEARCH AND MANUFACTURING

FEATURED IN THIS ISSUE:

Overview: Laboratory Suppliers

Overview: Food Ingredient Suppliers

What we do in the Shadows – Malt whisky in depth...

NZ Food Safety Science & Research Centre Red Meat Industry support

THE OFFICIAL JOURNAL OF THE NEW ZEALAND INSTITUTE OF FOOD SCIENCE AND TECHNOLOGY INC.

Contents

Food New Zealand

NZ'S AUTHORITY ON FOOD TECHNOLOGY, RESEARCH AND MANUFACTURING

OCTOBER/NOVEMBER 2024 | VOLUME 24, NO.5
ISSN 2744-7308 (ONLINE) ISSN 1175-4621 (PRINT)

Contacts

PEPPERMINT PRESS

Peppermint Press Ltd
5 Rupi Court, Mt Wellington
Auckland 1072, New Zealand
Phone 64 21 901 884 www.foodnz.co.nz

Food NZ is distributed online to all members of the New Zealand Institute of Food Science and Technology.
An online edition is shared internationally.

Visit www.foodnz.co.nz to subscribe.

Director and Editor
Anne Scott, Peppermint Press Limited
anne@foodnz.co.nz

Director and Writer
Dave Pooch, Peppermint Press Limited
davep@me.com

Advertising
Anne Scott,
anne@foodnz.co.nz
021 901 884

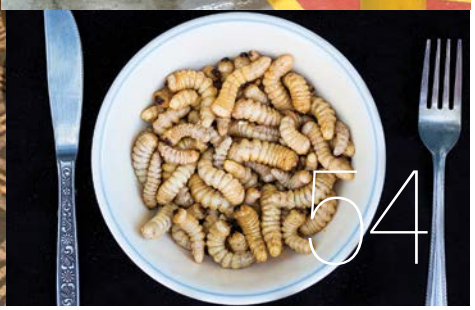
Design and Layout
Johanna Paynter, Pix Design

Regular Contributors
Esraa El Shall, John D Brooks, Laurence Eyres, Vincent Arbuckle, Dave Pooch, John Lawson , Nerida Kelton

Published by Peppermint Press Limited

Notice to Contributors
When submitting editorial for Food New Zealand please observe the following, Editorial to be submitted as plain text files, NO FORMATTING please. Images should be sent as high resolution .jpg or .tiff files. Do not embed images in word documents, send separate files. Any images smaller than 500 kb may not be printed as the clarity of the print may be compromised.

Advertisers
Material specification sheet and rate card on website, www.foodnz.co.nz



THE NEW ZEALAND INSTITUTE OF FOOD SCIENCE & TECHNOLOGY INC

Executive Manager, Wendy Bayliss
PO Box 44322
Pt Chevalier
Auckland 1022
New Zealand
Phone: 022 549 8483,
Email: wendy@nzifst.org.nz
Website: www.nzifst.org.nz

ON THE COVER

A magical image of a Tui, New Zealand's bird of the year in 2005. Taken by Matt Maingay in central Auckland. (@matt_-maingay_photography)

The springtime carolling and chortling of Tuis in Auckland brings a smile to many faces.

Next editorial and advertising deadline: November 20th, 2024

Features for December/January 2024

Overview: Consulting services to the Food Industry

EDITORIAL

From the Editor

Anne Scott FNZIFST, Editor

Informing the future from history

Next year NZIFST will be 60 years old. For many members that's older than their parents.

Only two of the original signees on the Institute's founding document are still with us, Emeritus Professor Richard Earle, of Massey University, and Ralph McCraw, who was Industrial Chemist at Wattie's for many years.

The Institute's first conference was held in 1964, and first AGM a year later in 1965, so as an Institute we recognise our first AGM as Founders Day, so to speak. The 50th Year Anniversary book contains an Institute timeline, up to 2015. You can read it on ISSUU, in the same place where you can read Food New Zealand.

In its current form, Food New Zealand is only 23 years old, but NZIFST volunteers published our own newsletters, journals and magazines, at some cost to the Institute, mostly until 2001. There was a short segue into having the Institute's news included in a commercial food industry publication, but loss of control of content meant that NZIFST took it back into the fold. The arrival of FoodNZ signalled a new era, an Institute journal, prepared by professionals, funded by advertising and costing NZIFST nothing.

NZIFST has experienced an active and progressive lifetime, creating an unsurpassed networking vehicle for those working in our food industry.

Branch meetings and, of course, Conferences combine networking opportunities with learning opportunities. Have a chat with a member over 50 and ask when they helped out someone in their network, and how someone may have helped them. The answers are enlightening.

And onwards to an uncertain future

Since 1965, our industry has changed enormously, a change accelerated by Covid which imposed recognition that a global supply chain may not be the best way forward for food manufacturers and consumers. Those working in the industry, and researchers at CRIs and Universities recognise the changes rushing towards us and embrace them

For example, NZFSSRC reports, this issue, on work that supports our red meat industry in ensuring our products are fit for purpose.

The changes in GE legislation will allow much work that has stalled to progress, to the benefit of our country.

As a remote nation and an industry we are increasingly recognising the value of "weightless exports", that is, IP, under license to overseas organisations and manufacturers which can be particularly lucrative, providing the licensing is handled professionally.

Change is frightening but *Homo sapiens* is the ultimate survivor and great advances come out of new situations.

Anne Scott FNZIFST, Editor

Newsbites

Food New Zealand's round up of news about NZIFST members, associated companies and other items of interest.

Langdon – Ingredients Inspiring Innovation for the Food & Beverage Industry

30 years in New Zealand

As Langdon celebrates 30 years in New Zealand, they are excited to announce a new chapter: a move to a newly refurbished office in a recently completed business park, just minutes from Auckland's CBD. This new location will feature a contemporary product development kitchen, providing a collaborative space for customers to work closely with the Langdon team. The office will also house their sales and customer service, quality assurance, supply, and logistics teams, all offering local expertise to support their partners' growth.

To mark this 30-year milestone, Langdon is launching an inaugural roadshow event, showcasing a range of innovative tasting experiences curated by their in-house product development team. The event will feature Senior Innovation Manager Leslie Lim, who will lead the tasting sessions, supported by the wider New Zealand team to offer insights into the global trends shaping the food and beverage industry. As they look to the future, Langdon are committed to helping their partners grow and thrive, with access to the highest-quality ingredients, and invaluable insight.

For 30 years, Langdon has confidently navigated the New Zealand market, supplying food and beverage manufacturers and wholesalers with the finest quality ingredients. In a landscape currently driven by sustainability, wellness, and bold flavours, Langdon has consistently met the demands of discerning consumers, offering a one-stop shop for manufacturers. Their extensive pantry, filled with ingredients that deliver both flavour and function, ensures that their partners are equipped to create products that excite and satisfy.

Building on 170 years of global expertise, Langdon has cultivated a robust network of leading suppliers, establishing lasting relationships that have been the cornerstone of their success in New Zealand. Over the past three decades, they have opened doors for local manufacturers to access this exclusive global pantry, becoming an indispensable partner in the industry.

Campylocteriosis progress

New Zealand Food Safety is approaching its target to reduce rates of campylobacteriosis, the country's most common foodborne illness, a new report has found.

The report, prepared for New Zealand Food Safety by the Institute for Environmental and Scientific Research (ESR), found that the rate of New Zealand-acquired foodborne illness caused by the bacteria Campylobacter has fallen from 88 to 77 cases per 100,000 population over the past 4 years.

"New Zealand Food Safety has made reducing campylobacteriosis rates a key priority, and we've made great strides in recent years," says New Zealand Food Safety deputy director-general Vincent Arbuckle.

"Rates of infection more than halved between 2006 and 2020. In 2020 we set a target to reduce the rate by a further 20%, taking it to 70 cases per 100,000 by the end of 2024.

"These latest results show this goal is in sight, which is a testament to the combined and sustained work of government and industry over time.

"The Campylobacter Action Plan, put in place to help tackle the issue, mainly focuses on steps to reduce the levels of Campylobacter through the poultry food chain. We have worked with government, industry and NGOs right across the poultry food chain through the Campylobacter governance group with representatives from Ministry of Health, Poultry Industry Association of New Zealand, Foodstuffs North Island, Foodstuffs South Island, Woolworths NZ, and Consumer NZ."

The report also provides data on other foodborne illnesses in New Zealand, including listeriosis, which remains steady with 37 cases notified this year, Mr Arbuckle said.

"*Listeria* is common in the environment and while case of illness are low, listeriosis can have tragic consequences, including death. Of the notified cases, 26 people were in the 60-plus age group, and 7 people died with listeriosis this year.

Inghams Chief Executive – New Zealand, Ed Alexander

100% renewable electricity from 2025

– for Inghams operations in New Zealand

Poultry provider, Inghams, has announced that it has entered into a long-term agreement with Lodestone Energy, New Zealand's leading utility-scale solar generation company, for the provision of renewable energy across its New Zealand operations.

From April 2025, the agreement will see Lodestone Energy generate electricity from its multiple solar farms to meet 100% of Inghams' electricity requirements across its New Zealand network, ensuring its operations are more sustainable and resilient.

Inghams Chief Executive – New Zealand, Ed Alexander, said Inghams is delighted to be working with Lodestone Energy on this innovative solar agreement: "Sustainability is at the core of our operations, and this agreement is an important step in delivering on our sustainability targets by sourcing 100% of our electricity requirements from renewable sources.

Gary Holden, Managing Director of Lodestone, said: "We are like-minded organisations, and it is satisfying to us to see another industry segment acting quickly to embrace our solution.

As a part of this agreement, Lodestone will supply Inghams with Renewable Energy Certificates (RECs).

"RECs are becoming recognised as the most tangible way for electricity consumers to contribute to the green energy transition. By offsetting 100% of their consumption with new sources, Inghams directly play their part in a decarbonised future," said Mr Holden.

The agreement also reduces the number of carbon credits purchased every year from the voluntary market for Inghams' two Toitū net carbonzero certified brands (Waitoa Free Range Chicken and Let's Eat plant-based).

About Lodestone Energy

Lodestone Energy Limited is a New Zealand utility-scale solar generation company. It was founded in 2019 to help the national effort to decarbonise the energy sector. The company has four utility-scale solar farms operating or under construction in Northland, the Bay of Plenty and the Coromandel. Further sites in Dargaville, Manawatu and Canterbury are expected to commence in 2025.

Government funding for fish product development

Culturing new seafood products in the laboratory is the focus of a new $9.6 million programme funded by the New Zealand Government.

The new five-year Endeavour Fund programme will allow Plant & Food Research scientists, led by Dr Georgina Dowd, to develop new fish cell production systems in a New Zealand context. This technology has the potential to change the way we produce seafood and generate marine products (for example, marine collagen) through a technology known as cellular agriculture (CellAg). CellAg has been developed for animal products – with cultivated chicken available in Singapore and the USA – and developing a production system for fish is an opportunity for New Zealand to meet the global demand for new sustainable seafood and marine products. The programme will also investigate the New Zealand social and cultural aspects associated with acceptance of cultured fish products, including Māori views with respect to taonga species.

Four Smart Ideas projects from Plant & Food Research were also funded through the Endeavour Fund process. Dr Wei Hu will lead a project to develop methods for assessing soil vulnerability that support sustainable soil management practices. Dr Hayley Ridgway and Justine Larrouy will investigate the microbiome of vineyards as a method of controlling grapevine trunk disease, which costs New Zealand growers $130 million a year in crop losses. Dr Maren Wellenreuther will develop a method for aging pāua based on epigenetic DNA testing to support sustainable pāua fisheries management. Dr Andrew Dare and Dr Andrew Allan will investigate whether compounds in silvervine, a species of kiwifruit, can be used as a control method for feral cat populations.

Leader of the Endeavour Fund programme, Georgina Dowd, in the lab. Copyright © Plant & Food Research. All rights reserved

Dr Aaron Low, Chief Technical Officer, amaea, working at their R&D lab in-Hamilton, New Zealand

A "weightless export" success

Molecularly imprinted polymers successfully remove smoke taint in wine

Wine science researchers from the University of Adelaide have found that a tailor-made polymer developed in New Zealand could hold the key to removing smoke taint in wine.

Professor of Oenology, Kerry Wilkinson and her colleagues have successfully tested a method to lessen smoke taint in wine, validating the use of molecularly imprinted polymers (MIPs) to target removing the volatile phenols responsible for the smoke taint.

Researchers added MIP beads to smoke-impacted wine which selectively bound and removed the target compounds, ameliorating the wine's sensory profile. MIP specialists, amaea, developed the MIPs used in the Australian Government funded study.

The research showed the MIP technology was successful at removing guaiacol, 4-methylguaiacol, cresols, and phenol. The findings were recently published in ACS' Journal of Agricultural and Food Chemistry: Amelioration of Smoke Taint in Wine via Addition of Molecularly Imprinted Polymers during or after Fermentation.

Dr Aaron Low, Chief Technical Officer, amaea, said: "Removing smoke taint from wine has long been a challenge for winemakers as often more is stripped away than desired. It's great to see the results of this study as it provides further validation that our technology is effective for smoke remediation.

Dr Low says not every smoke-impacted wine is the same. "The level of removal required not only relies on the MIP design but the way MIPs are applied. We've learnt that using our MIPs in a filtration system, with adjustable treatment rates, tailors the outcome. This means the volatile phenols can be reduced enough so that they sit below sensory thresholds, while the integrity of the wine's varietal body and character can remain intact to suit geographical, market and brand preferences. Longitudinal studies also confirm smoke markers won't return."

Dr Low says after more than a decade of research, it's gratifying to see amaea's MIP technology in market and helping vineyards and winemakers with a solution to recover value from smoke tainted wine.

amaea's MIP solutions are already being commercially used in the United States, Canada and New Zealand with plans to launch in Australia and Europe.

About amaea Ltd.

amaea is paving the way as the world's first innovators of molecularly imprinted polymer (MIP) technology for large-scale operations.

amaea's reusable MIPs selectively capture target molecules from liquids. This enables beverage producers to tailor the sensory profile of their products, using a low-impact production solution.

Careers

Industry 4.0: The key to providing value in a world of constant change

John Lawson, Lawson Williams Consulting Group

What does the future hold?

I found the recent NZIFST conference excellent but at the same time somewhat unsettling. There was plenty of discussion about the future and the wave of change coming our way. There is plenty of excitement and opportunity and some trepidation.

It was obvious however that we struggle to fully verbalise what it might mean, to understand how it will impact us, how we will work in the future and what work we will do?

In the final plenary session, Chris Kane and Melody Taylor gave us some valuable insights into how Fonterra are approaching AI. They talked about some obvious opportunities which are available for all businesses, however I think Chris gave us all some important insight into the future by saying.

"It's not about having the answers, it's about learning to ask the right questions!"

Let's face it – Industry 4.0 is like tackling the most complex jigsaw puzzle you've ever encountered. We're talking about every piece of modern business innovation: artificial intelligence (AI), the Internet of Things (IoT), cloud computing, big data, automation – the list goes on.

But no one – no single company or individual – holds all the pieces. There are simply too many moving parts. Technologies evolve, processes shift, and best practices transform faster than ever before. It's chaotic, but that chaos presents immense opportunities for those willing to navigate the unknown.

What you can do now, what you should learn

1. Learn to ask the RIGHT questions

In this fast-evolving landscape, the ability to ask the right questions is essential. To develop this skill, focus on building curiosity and critical thinking. Begin by breaking down complex problems into manageable chunks. Ask questions like: "What's the real issue we're trying to solve? What are the potential solutions?"

Learn to question assumptions and challenge the status quo.

Engaging in interdisciplinary learning – by exploring subjects like business strategy, technology, and data analytics – will also sharpen your ability to frame questions that drive innovation.

2. Manage Change: Developing Skills to adapt and remain valuable

The only constant in Industry 4.0 is change. To stay valuable, you must not only adapt but lead change. Develop agility by embracing continuous learning. Upskilling in emerging technologies like AI, automation, and data analysis is crucial, but equally important is mastering soft skills like communication, leadership, and change management. These skills help you guide your organisation through the disruptive waves of innovation. Engage in training, seek mentorship, and stay connected to industry trends to prepare yourself – and your employer – for whatever comes next.

Embracing the Future of Work

The leaders of Industry 4.0 aren't just those who adopt the latest technologies; they are the ones who understand how to blend curiosity, adaptability, and leadership to ask the right questions and guide change. Data scientists, cybersecurity experts, and change management professionals are just the tip of the iceberg – anyone can provide value in Industry 4.0 by staying curious, developing new skills, and embracing the mindset of lifelong learning.

John Lawson is founder of Lawson Williams Consulting Group. He initially studied Biotechnology at Massey and is a Fellow of NZIFST. He now enjoys leading a team of recruitment consultants, helping people like you develop satisfying careers.

NZ Food & Grocery Council

Update: October 2024

Raewyn Bleakley, Chief Executive, NZ Food & Grocery Council

It's been a while since FoodNZ readers have heard from NZFGC, but rest assured we have been working hard to represent the views of food and grocery manufacturers in what has been a very challenging year for the sector. I came onboard as Chief Executive of NZFGC two years ago this month, and I have been very focused on the ongoing Grocery sector reforms as the objective voice for suppliers.

Since starting out with a degree in Human Nutrition some years ago, I worked in several industry associations advocating on behalf of businesses including Bus and Coach Association of NZ and the Wellington Chamber of Commerce, prior to moving to the public sector where I held senior roles in Government agencies such as Waka Kotahi and Fire and Emergency NZ.

NZFGC started this year by expanding our in-house staff with the appointments of Holly Cotter as General Manager and Donnell Alexander as Health and Regulatory Manager. Holly has been managing our communications programme, supporting several of our working groups and leading work in the policy space. She has brought a wealth of public affairs, strategy and policy experience to NZFGC.

Donnell, who has a longstanding relationship with NZIFST as a nutritionist and dietitian working across the food industry and government sectors throughout her career, runs our Health and Regulatory working group and engages with members on a range of issues from Health Star Rating to cost recovery and all submissions in between.

This year we also adopted a new NZFGC strategy to take us through to 2029. The three key themes in the strategy focus on:

1. Advocating for industry by impactfully engaging, building strong, dynamic relationships and equipping and informing members;

2. Backing excellence by being a conduit for best practice, working collaboratively with retailers and enabling supplier growth

and

3. Championing change by advocating for sustainable practices, talent retention and backing healthier outcomes for New Zealanders.

There's no doubt that the role of NZFGC during this time of grocery reform is as important as ever. We need to continue to work assiduously, gaining the supplier protections intended by the grocery reforms. Our advocacy takes many forms – from keeping members and the wider supplier network up to date and providing training, guidance and support, to listening carefully to the variety of experiences and views, then reflecting these as an accurate list of concerns to be discussed with officials and politicians. We act as an important conduit, providing timely real-world supplier experiences to inform government activity including what policy boffins quite rightly call "evidence-based submissions".

In the health and regulatory area we have made forty submissions in the last year, bringing our practical "lived" food industry experience to the forefront.

So often, other commentators (for example the media, public health spokespeople, social media influencers) try to speak for food manufacturers. They attempt to tell the public what motivates us and how we will react to given situations, having no actual working experience of the sector. It provides us with endless opportunities to be the authentic voice for food manufacturers and suppliers, and with your help and support this will continue to be practical, balanced and evidence-based.

We strive to constructively work together for better industry outcomes, fair and transparent trading relationships: ultimately for the benefit of our consumers. Enabling an industry where our members have confidence to invest and innovate is also crucial to this outcome.

Right now we are very focused on getting better outcomes in the Grocery Code review that's underway. We are also maintaining our voice and ongoing progress in other critical areas of focus: sustainability, recycling and waste systems, supply chain, Health Star Rating, "ultra-processed foods", Codex and ISO Standards development and the joint regulatory system for food labelling and composition to name a few.

We are committed to continue this important work on behalf of our members and from now on FoodNZ readers will get regular updates from us. We're looking forward to coming together with our diverse membership in November at our Wellington conference, to keep making progress on all these topics and opportunities.

NZ Food Safety: addressing Listeriosis

Boosting awareness and best practices to avoid *Listeria*, contamination.

Vincent Arbuckle, Deputy Director General, New Zealand Food Safety

Listeriosis is a life-threatening disease caused by the bacterium, *Listeria*, which is widespread in the environment. Although it is a rare disease, every year vulnerable people die from listeriosis. It is, however, preventable.

New Zealand Food Safety (NZFS) ran a campaign in June this year to help some of those most at risk – pregnant and older people – better understand the risks of listeriosis and what to do to decrease them.

Listeria, is dangerous

Listeriosis, while low in total numbers, has a very high rate of hospitalisation and is associated with fatality in the elderly, immune-compromised people, and foetal loss in pregnancy. Its effects on our vulnerable population are devastating for victims and their families. Most listeriosis infections in New Zealand come from eating or drinking contaminated food with high levels of the foodborne bacterium, *Listeria*.

For healthy adults, the signs of infection might include mild diarrhoea and flu-like symptoms. For pregnant people however, listeriosis can cause stillbirth, premature birth, or miscarriages. For the frail elderly or others with a weakened immune system, listeriosis can lead to severe illness and even death. As you age, your immune system gets weaker. This means foods you safely ate in the past may no longer be safe for you to eat.

What is NZFS doing?

NZFS requires food businesses to control *Listeria* in the processing environment, and have measures in place to minimise, if not eliminate, its presence.

If something goes wrong, we support businesses with their consumer-level food recalls, and ways to improve their processes.

NZFS actively researches and conducts surveillance of case numbers and incidents of listeriosis and other foodborne illnesses in conjunction with the Institute of Environmental Science (ESR), with the most recent Annual report concerning Foodborne Diseases in New Zealand 2023 available on our website now.

New Zealand's food safety system works to prevent serious illnesses and deaths from foodborne illness each year including listeriosis.

Unlike in other countries, where cases of listeriosis are predominantly due to outbreaks, most cases in New Zealand are sporadic, making investigations and the identification of contaminated food source challenging.

Our focus is on improving controls within the food safety system to limit the potential for human exposure to foodborne pathogens and monitoring the impact of interventions over time. One of these interventions is to offer information and education to New Zealand businesses.

While changes in the food supply chain have achieved good results, consumer awareness remains an important part of the effort, and we are focused on communicating with vulnerable consumers.

During the development of our campaign, we worked with real people, tailoring the creative approach for both audiences, acknowledging that the way we needed to communicate with pregnant people would be very different to how we communicated with people over 65. Our campaign provided practical steps to prevent this life-threatening foodborne illness, with posters and brochures available for order.

What can you do as a food business?

Consumers are only at the end of the food supply chain. Reducing exposure of consumers to *Listeria* involves taking measures at all points of food production. NZFS supports and encourages businesses to implement and review control measures for *Listeria*, as well as test for *Listeria*, regularly and consistently when producing dairy and ready-to-eat foods, or products intended for older or pregnant consumers. As of June, there were three consumer recalls due to the presence of *Listeria*. NZFS works with food businesses to simulate recalls and respond to positive tests for *Listeria* in products.

Learn about *Listeria*, and its impact on New Zealand on our website: *Listeria*, guidance for the food industry | NZ Government (mpi.govt.nz).

Conduct your simulated recalls each year and get your team on board to learn - they are a great way to ensure businesses are ready to respond quickly to food risks. Check our guidance on MPI's website: How to do a simulated (mock) food recall | NZ Government (mpi.govt.nz).

You can also sign up for food recall alerts to be kept informed of any food that is being recalled, including those with suspected *Listeria*, contamination.

Together we can reduce the case numbers of listeriosis in New Zealand and help keep Kiwis safe.

Sliding on

Fabulous Fungi or Fiendish Foes?

Professor John D Brooks, FNZIFST

John Brooks' view of the food world through the lens of a microbiologist.

OK, that title was a bit over the top but was triggered by questions regarding mould-affected product.

I have written previously about toxic mushrooms, but on this occasion, I am more interested in toxins produced by the fungi. Indeed, I found myself down a rabbit hole of reading and on-line research.

Mycotoxins are secondary metabolites of fungal growth, organic molecules that are not directly involved in normal growth. When ingested, inhaled or absorbed through the skin, mycotoxins cause lowered performance, sickness or death in man or animals, including birds. Currently, over 400 mycotoxins are known. Probably, one of the most important mycotoxins is aflatoxin, of which there are four types. Aflatoxin B1 is the most lethal naturally occurring liver carcinogen.

Aflatoxins were discovered in the 1960s. I remember that it was impossible to obtain a turkey for Christmas in England because of "Turkey X disease" which resulted in the deaths of over 100,000 turkeys and other farm animals that had been fed on peanut and cottonseed meals.

Over the years, there have been many examples of mycotoxicosis. In Russia, *Fusarium* caused alimentary toxic aleukia when overwintered grains infested by fungi were consumed. In Japan, rice was contaminated by *Penicillium* resulting in "yellow rice" responsible for heart attacking paralysis. Over 20,000 deaths per year were observed in Indonesia associated with *Aspergillus* (Pitt, J.I. pers. comm). Toxins are produced on cereals, both in the field and in storage. In surveys, over a hundred different food categories, including beer and wine, juices, dried fruits, spices, meat, egg and coffee i.e. all the good things! have all been found to contain aflatoxins. Aflatoxin B1 has been found in 64% of chilli in the USA.

What is an acceptable level of contamination is rather difficult to find and there are conflicting specifications. The European Commission considers 4 µg/kg to be an acceptable level, but the European Commission Regulation (EC) No 466/2001 of 8 March 2001 setting maximum levels for certain contaminants in foodstuffs stated that: "For substances of this type, there is no threshold below which no harmful effect is observed. No tolerable daily intake can therefore be set… Aflatoxin B1 is by far the most toxic compound".

A common question is "What is the probability that *A. flavus* growth on the dry product has produced aflatoxin?" This is a function of temperature and relative humidity of the storage environment and this information is often not available. Mould growth was studied at a range of temperatures and RH and the production of aflatoxin was assessed. Growth and toxin production occurred at all temperatures between 10ºC and 40ºC at RH between 12% and 98%, with the optimum for toxin production being 30ºC and 98% RH. Thus, if the product is infested with *A. flavus* during storage, it is highly likely that aflatoxin will be produced.

Detection and quantification of mycotoxins is possible, but not within the capabilities of most food companies, as the equipment is expensive and requires skilled operation. HPLC, TLC, HPTLC, GLC, ELISA and MS have all been proposed for quantification, and immunochemistry kits can be used to detect mycotoxins. Since aflatoxin may be present only in traces, monitoring requires equipment that can identify the toxins at ppm and ppb levels. It is also possible that more than one form of toxin is present in a single sample.

Of course, the next question is "Can the mould be screened out of the product and how can the aflatoxin be removed during processing?" Unfortunately, aflatoxins are very stable and resistant to most forms of food and feed processing. It is also very difficult to find complete time/temperature data on destruction by heating. Higher temperatures and longer heating times do result in greater degradation of mycotoxins, however, this processing may also affect important food quality factors. The optimum degradation conditions have been experimentally determined in controlled conditions to be 216.57 °C/63.28 min and 210.85 °C/54.71 min for pure mycotoxins and spiked into maize flour, respectively.

Of course, there are other possible means to destroy mycotoxins. For example, microwave heating in industrial microwave ovens can reduce aflatoxin as expected, with the decrease being a function of treatment time, microwave power and achieved temperature. Reductions achieved were between 23 and 56%, but processing in domestic microwave ovens had little or no effect on remaining aflatoxins.

Several authors have proposed the use of organic acids, including citric acid, tartaric, succinic, acetic and lactic acids, but, once again, these acids will influence the sensory attributes of the food.

In view of what I have written above, in my opinion, the best way to deal with mycotoxin formation in grains is to control the harvesting, handling and storage of susceptible grains to ensure that mould growth is prevented.

Now that's not going to be difficult, is it?

Overview

Laboratory Suppliers: consumables, instruments, data management systems, rapid analysis systems

Everything you need is at Acorn Scientific

Acorn Scientific is a privately-owned New Zealand business that has been supplying the food industry since 1997. We sell and service a wide range of laboratory equipment and products and source brands to supply based on quality and reliability with some unique products for niche applications.

The products we supply to the food industry include:

Sterilisation: Rodwell and Icanclave autoclaves. 3M and True-Indicating sterilisation monitoring supplies.

Water purification: Heal Force and Harmony laboratory water purification systems.

Microbiology Products: IUL dilutors, stomachers, air samplers, colony counters. 3M Neogen Petrifilm plates for quality indicator testing and sampling products. Biotool and Raypa liquid media preparators/dispensers.

Pipettes: IKA range of single and multi-channel pipettes.

Hygiene monitoring: 3M Neogen Clean-trace rapid hygiene monitoring products including both ATP and protein detection technology.

Allergen testing: Range of 3M Neogen Allergen testing products.

Data-logging: Vaisala temperature and humidity environmental monitoring products, Star-Oddi pasteurisation monitoring, T-Zone single and multi-use temperature loggers.

Electrochemistry: pH and conductivity monitoring and other from TPS, Jenway, Ionode, Hanna and others.

Refrigeration/Freezing: Arctiko, So-Low, Haier and CLST. Solutions for any cooling application.

Separation and handling: Kubota full range of centrifuges. Glenammer laboratory sieves.

Biosafety cabinets and Fume-hoods: Full range of Biosafety cabinets, Laminar flow hoods and Fume hoods from Baker, AirClean, Heal-Force and Biobase.

Wine testing: Vintessential enzymatic test kits.

Fat, Fibre and Protein testing: OPSIS liquidline systems.

Container testing: Somex PET and glass bottle testers.

Carbonated drink sample preparation and testing: Somex CO2 degasser and tester.

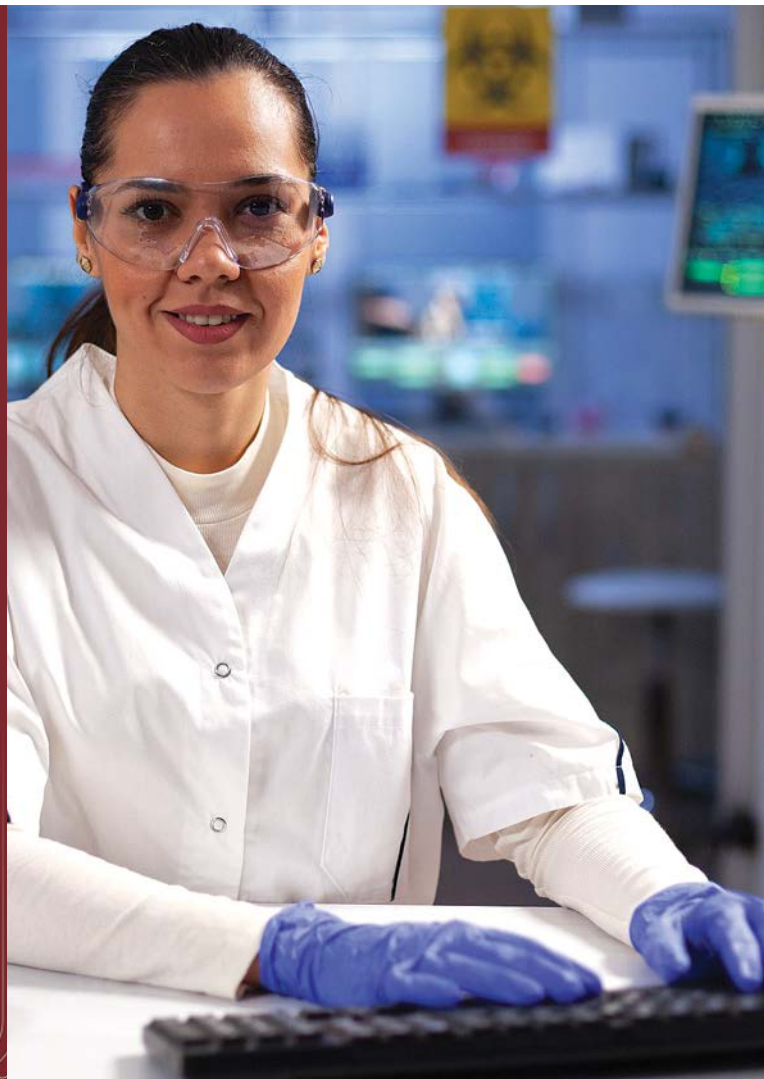
Heating: Full range of incubator and ovens from IKA, Carbolite, Jeiotech, Labwit.

Powder dispensers: XQ instruments range.

Liquid handling: Hirschmann digital burettes and bottle top dispensers.

We also offer a general range of laboratory products including shaking water baths, Spectrophotometers UV and visible, stirrers, ultrasonic cleaning baths, shakers.

Ask us for any specific application or product requirements!



Bio-Strategy – Part of DKSH Group

Multiple solutions for the New Zealand food and dairy industry.

SKALAR: Automated nutrient and nitrogen/protein analysers for food and beverage analysis to monitor product quality, guaranteeing food/feed safety and compliance with official regulations.

JASCO: FTIR Application in Food Analysis; for component analysis of dairy product and identification test of food additives

GOLD STANDARD DIAGNOSTICS: Diagnostic test kits and instruments for Food, Feed, and Environmental Safety for applications in research and industry.

PERKINELMER: Food and feed safety testing for a safer global food chain. A diverse range of test kits to detect antibiotics, hormones, veterinary drug residues, natural toxins, pathogens, and industrial contaminants.

HAMILTON: Sensors for process analytics in the food and beverage industries. Optical DO and pH process sensors offer lower operating costs, tighter process control; seamless calibration, troubleshooting and connectivity. foodInspect™ NIMBUS® for 3M™ Molecular Detection System. Automation solution for quality pipetting.

MOLECULAR DEVICES: Absorbance microplate readers for beer, wine and food safety analyses, including gluten level testing, yeast metabolism, colour and bitterness (IBU's); L-Malic acid and phenolic compounds; and Endotoxin testing and melamine detection in GLP/GMP environments.

RAD SOURCE: Patented Quastar® Photonic Decontamination technology provides the cannabis industry with the only technology to safely inactivate Mould, Powdery Mildew, *Aspergillus*, BTGN, Yeast, *Salmonella, E. coli*, Coliform and other challenging microbes.

OHAUS: A wide range of balances, scales, pH meters, and moisture analysers that meet the demands of the foods industry at economical prices.

MIELE PROFESSIONAL: Under-bench and stand-alone laboratory washers/disinfectors with a large range of accessories. Passive drying or active HEPA filtered drying models.

PRIORCLAVE: Autoclaves for all your sterilisation needs.

ESCO: Ovens and incubators from 32L to 240L as well as a wide range of Laminar Airflow Cabinets in either horizontal or vertical airflow formats providing ULPA filtered clean air.

FLP – Your customer-focused, one-stop shop for Testing!

Based at Waikato Innovation Park, Food Lab Pacific (FLP) is a laboratory that is breaking into the foods testing space. FLP was initially started to support the growing need for testing of manufactured dairy products and has continued to innovate in the dairy sector whilst entering into other testing areas.

Recently our innovative technical team have been focused on supporting both our current and future customers with testing their foodstuffs. Whether it be routine testing or through method development projects, our customer-focused team work closely with food manufacturers across New Zealand to support their testing needs.

Some of our latest developments include:

- Rapid Multi-Pathogen Testing – Testing 5 pathogens from only 2 swabs! This is a more sustainable, affordable and convenient way to monitor manufacturing environments.
- Food Safety Testing – Our most recent addition to our ever-growing testing options!
- Food Microbiology
- Rapid Pathogen Detection
- Detection of Metals
- Watch this space for more coming soon...

- IT solutions including system to system reporting – Customised to suit you and removes the need for manual result entry.

Through our local and global network of ALS labs, we can support your food safety regimen by providing routine and one-off in-process, final product, hygiene, and water testing solutions. Additionally, if you have a new product or a testing requirement that isn't so 'routine', get in touch with us – our Research & Development team may be able to help!

FLP is continuing to grow in collaboration with our customers, so keep an eye out for even more new methods in the future!

Thermo Scientific™ Environmental Flexi Swabs

Enhance your surface sampling!

Thermo Fisher Scientific offers the Environmental Flexi Swabs, specifically designed for surface sampling in the food, dairy, beverage, cosmetic, and pharmaceutical industries.

Environmental Flexi Swabs feature a ready-to-use swab and transport tube system, ensuring the viability of microorganisms during transport. With a large sample head, these swabs provide enhanced recovery, leaving virtually no gaps on surfaces. The user-friendly design includes a tamper-evident seal for sterility and integrity, and a pre-moistened swab with a specially formulated diluent and neutraliser to break down chemical disinfectants present on surfaces.

We understand the importance of accessibility and ease of use. The swabs feature a large, gripped sample handle to prevent contact with the swab or transport tube, and a long flexible shaft (150mm) for reaching awkward and hard-to-access areas. The unique 'O' ring ensures containment of the sample during transport and storage.

Our Environmental Flexi Swabs are terminally sterilised via gamma irradiation, eliminating concerns about microbial contamination. Additionally, we offer a vegetable peptone-based format for specific preferences and requirements.

Suitable for swabbing all types of surfaces within the food, dairy, and beverage industries, these swabs are designed to extract organisms effectively. They also contain active neutralisers that break down chemical disinfectant residues that may be present on surfaces.

Visit our website to learn more and transform your sampling processes. With Thermo Fisher Scientific™ Environmental Flexiswabs, you can achieve excellence in maintaining hygiene and safety standards, ensuring safer and more reliable outcomes for your products and consumers.

ATA Scientific

Analytical tools for measuring food quality

Used to determine particle size and size distribution for foods and additives, Malvern Panalytical's latest Mastersizer 3000+ (see picture) offers a significant advancement in particle size analysis, combining decades of trusted expertise with state-of-the-art technology. Seamlessly integrating artificial intelligence (AI) and data science-driven software solutions, this cutting-edge automated instrument offers a helping hand to users at all proficiency levels. Particle size defines mouth feel and is important for controlling manufacturing costs. With a dynamic range spanning 0.01 to 3500 microns, the Mastersizer 3000+ delivers precise, robust wet and dry particle size measurements tailored to the operator's application needs. A small footprint, exceptional dry dispersion capabilities and intuitive software designed to ease user workload have resulted to its enduring appeal and propelled the system as the unit of choice.

The Malvern Zetasizer Ultra is used for the measurement of particle and molecular size, particle charge and particle concentration. The system can be used to determine optimal concentrations of food additives for desired taste and smell performance or to improve emulsion stabilisation of flavourings.

The new Zetasizer Ultra delivers enhanced speed and ease of use, accelerating sample throughput. Multi-Angle Dynamic Light Scattering (MADLS) technology provides higher resolution, more complete particle size distributions and calibration-free particle concentration analysis to enable even greater insight into your samples.

Phenom Desktop Scanning Electron Microscope (SEM) is an essential tool used to study the relationship between food processing conditions and morphological changes of the food components, as the structure of foods can influence nutritional value. The Phenom XL G2 desktop SEM is easy to use and offers superfast imaging with fully integrated X-ray analysis to enable both food structures to be physically examined and their elemental composition determined. New automation solutions for quality control (QC) enable manual, repetitive tasks to be automated and a high volume of samples to be quickly processed. Particles, pores, fibres can be automatically characterised and foreign contaminants automatically identified for chemical composition.

Dissolved Oxygen in Milk and Dairy Products

Anton Paar

Dissolved oxygen (DO) in dairy products is a critical quality parameter affecting the nutritive value, colour, taste and shelf life of dairy products. During pasteurisation DO has to be removed from the milk to improve process performance and to secure consistent quality of the final product.

To assure your product contains the target DO content, Anton Paar's inline oxygen sensors Oxy 4100/5100, can be easily integrated directly into your production line.

1. Milk pasteurisation process

The milk pasteurisation process consists of a series of process steps, which transform non-sterile raw milk into a sterile product. On arrival at the dairy processing plant, the milk will contain an equilibrium amount of approx. 8 ppm DO and finely dispersed air as a result of transportation. During the processing and in the final package the DO content should be lower. Deaerators are used to remove dispersed air and reduce the oxygen (O_2) content to a target value of 0 – 3 ppm. Typically, this is done before the temperature treatment to improve efficiency of heating and to minimise the oxidation rate during the high temperature processing. Deaeration also prevents foaming, maintains constant filling and reduces fouling, development of stale flavour and loss of O_2-sensitive ingredients (vitamins C and B9).

2. Application of the Oxygen Sensors

To assure the goal of deaeration has been accomplished the concentration of DO must be measured. The oxygen sensors Oxy 4001/5100 easily detects any deviations from the target DO value. This allows adjustments of deaeration to correct the production process (e.g. by increasing vacuum when the measured values are too high). The sensor should be installed after the deaerator at the pressure side of the pump (Figure 1).

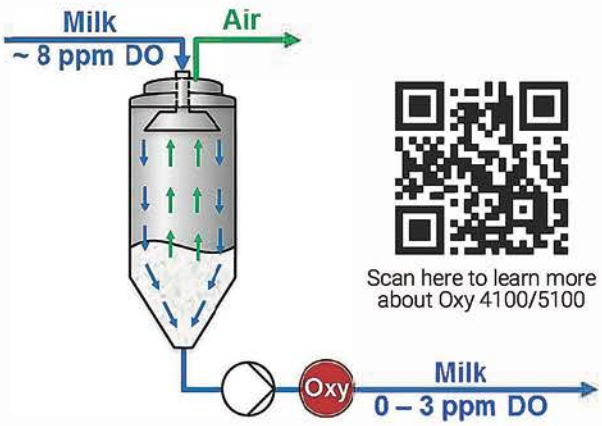


Figure 1 Installation recommendation of the Oxy Sensor

Installing the sensor prior to packaging enables the last check of the DO values before the product is filled into its final package.

Dairy products to be measured

The oxygen sensors Oxy 4100 and Oxy 5100 are suitable for DO monitoring in

- any kind of milk
- flavoured milk drinks and milk smoothies
- sour milk products (i.e. soured milk, kefir, yoghurt, cream yoghurt, buttermilk)

3. Measurement Setup

Anton Paar's oxygen sensors, the Oxy 4100/5100, can be easily implemented directly into the production line with a VARIVENT® Type N process connection. Easy process integration in combination with the robust and hygienic design makes the oxygen sensor a minimum maintenance device.

4. Benefits

The reliable and accurate oxygen measurements enable to:

- eliminate manual grab sampling and avoid sampling errors
- detect any irregularities in DO content and control the deaeration in real-time
- optimise energy efficiency of dairy processing and reduce operating costs
- reduce raw material input of O_2-sensitive ingredients
- extend shelf life of dairy products

Contact us to discuss your application and receive the full application note

Anton Paar New Zealand
E: info.nz@anton-paar.com
T: +64 9 414 3190
www.anton-paar.com/nz-en

Overview

Elevating Food and Beverage Safety and Innovation

Lab Supply is a family-owned laboratory supply business and is dedicated to providing the necessary tools and solutions that ensure food processing and production meets the highest standards of safety and innovation. We partner with over 70 leading global brands including Merck, Memmert, Heidolph, Greiner Bio One and Brand.

A Commitment to Quality

Quality assurance and control are at the core of every successful food and beverage operation. Lab Supply offers a comprehensive range of products, from analytical instruments and sampling equipment to consumables and safety gear. Each item is carefully selected to meet the unique demands of the food industry, ensuring compliance with both local and international regulations.

Beyond products, Lab Supply's team of knowledgeable professionals provides expert guidance to help businesses choose the right equipment and maintain rigorous testing protocols. This support enables companies to not only comply with regulations but also to enhance their reputation for quality and reliability among consumers.

Innovation at the Forefront

With innovation driving success in the food and beverage industry, Lab Supply ensures manufacturers and processors have access to the latest advancements. By staying at the cutting edge of technology, Lab Supply equips businesses with tools that streamline operations and improve product development.

Sustainability in Focus

As sustainability becomes an increasingly important consideration for consumers and businesses alike, Lab Supply is committed to supporting eco-friendly practices within the food and beverage sector. Select from a wide range of sustainable lab solutions, from recyclable packaging materials to energy-efficient laboratory instrumentation.

Hill Labs

We've been delivering analytical testing services to Aotearoa New Zealand for a long time, since 1984 in fact. Today, we are proud to be a trusted service provider to customers across a broad range of industry sectors.

At Hill Labs, we continually adapt and expand our services to meet the growing demand for sustainable solutions.

PCR Testing with Hill Labs

We understand that providing results in the shortest time possible is imperative for our customers - that's why we have a strong focus on innovation and advancing our services to meet the needs of the food and beverage market. We are constantly evaluating our processes to ensure our value offering is ahead of the game.

Our latest innovation simplifies environmental monitoring programmes by allowing clients to test for up to four organisms using just one swab, using both Tempo and PCR technology. This advancement not only saves time and effort but also minimises the use of single-use plastics, supporting both efficient operations and environmental sustainability.

Environmental swabbing is a crucial microbiological process used to test food preparation surfaces, equipment, and utensils for the presence of pathogens.

In short, our 3-in-1 and 4-in1 Swab Testing kits:

- simplify sampling,
- increase efficiency in the laboratory,
- reduce waste are extensively validated.

The two variants offer slightly different capabilities.

Use 3-in1 Swab Testing for –

- *Enterobacteriaceae* enumeration and
- *Salmonella* detection and
- *Cronobacter* detection.

Use 4-in-1 Swab Testing for –

- *Enterobacteriaceae* enumeration
- *Listeria* species detection
- *L. monocytogenes* detection
- *Salmonella* detection

eBook: The Field Guide to Food Powder Characterisation

FREE from Anton Paar

In the world of food manufacturing, finding the perfect formulation is key to achieving both product excellence and cost efficiency. Besides liquid or pasty products, powders play a vital role in the food industry as key ingredients or final products. This new eBook *The Field Guide to Food Powder Characterisation* delves into the crucial role of particle size and particle size distribution in food powder optimisation, enabling manufacturers to deliver higher quality products while reducing production expenses.

"This comprehensive guide explores the importance of particle size analysis and how it affects various aspects of food powder formulations. Manufacturers will gain insights into particle size analysis, laser diffraction techniques, and additive influences to optimise product quality and reduce costs."

Taking the example of chocolate powder, the eBook delves into the specific challenges faced by cocoa mass grinding, highlighting the need for optimal particle size to maximize cocoa butter extraction while minimising the use of costly viscosity modifiers. The role of particle size in achieving desirable mouthfeel and texture is also explored, emphasising the significance of homogeneous particle sizes within formulations.

Furthermore, the eBook discusses the particle size analysis of common chocolate additives such as milk powder and sugar, shedding light on their impact on the overall particle size distribution of chocolate powders. Through insightful graphs and measurements, readers gain valuable insights into how different additives can influence the particle size parameters of food powders.

Key Learning Points:

- Best practices for modern characterisation of food powders.
- Key measuring principles that correlate with high quality end products.
- The latest state-of-the-art measuring devices used to ensure consistency and stability of food powders.

Don't miss out on this valuable resource.

Download this FREE eBook now and take your food powder formulations to the next level! (link from image).

Enhance every step from paddock to plate with FOSS

At FOSS, we are committed to transforming the food and beverage industry with precision and reliability. Our comprehensive portfolio, including industry-leading instruments like MilkoScan™, ProcesScan™, ProFoss™2, FoodScan™2, DS3™, WineScan™, BeerFoss™, and Kjeltec™, places us at the forefront of food analysis, ensuring the highest standards of quality and safety.

Our advanced instruments offer unmatched accuracy and efficiency, revolutionising how you monitor and control your production processes. Take the ProFoss™ 2 inline NIR spectrometer for example – it transforms batch management with real-time analysis, delivering a sample result every 1-3 seconds. This rapid response allows for precise parameter control, significantly enhancing ROI compared to traditional 'grab sample' methods.

We are also excited to introduce the upcoming Micral™ and MycoFoss™ instruments, designed to further expand your analytical capabilities. Micral™ provides rapid allergen detection with high sensitivity, while MycoFoss™ offers precise mycotoxin analysis, ensuring product safety and compliance with regulatory standards. These innovations reflect our ongoing commitment to delivering cutting-edge solutions tailored to the evolving needs of the food and beverage industry.

Whether you're working with dairy, beverages, or grains, FOSS instruments are integral to your analytical process, providing the confidence you need through superior analytics. Discover the difference with FOSS and elevate your analytical capabilities – visit our website or contact us directly to learn how we can support your quality control needs.

Matt Solutions

In our "Aotearoa world" of gas analysers, common problems like sensor breakdowns, blocked RO meters, inaccurate readings, and constant calibration can cause major disruptions. For handheld and benchtop units, weak suction, breakdowns and long downtimes can be costly. Fortunately, these issues are now history with Dansensor's Checkpoint 4 handheld analyser and Checkmate 4 benchtop analyser. These new tools are designed to boost accuracy, reliability, and efficiency in modified atmosphere packaging (MAP) testing.

The Checkpoint 4 handheld analyser is powered by an optical fluorescent O2 sensor, which offers:

- Longer sensor life, lowering the cost of ownership due to less frequent sensor replacements
- Inline pressure sensor means no missed blockages and therefore less damage to pumps
- One annual calibration
- 0–100% O2 measurement range
- No interference from volatile organic compounds (VOCs)

These features make the Checkpoint 4 extremely precise, while reducing maintenance and operating costs. It's easy to use, with software available for data management, meaning less operator error and quicker results. The cordless design and long sensor life keep production running smoothly with fewer interruptions. Premium models even offer data logging, transfer and analysis for deeper insights.

The Checkmate 4 benchtop analyser builds on a proven platform with added features to improve accuracy and reliability. It offers four measurement modes to adapt to different packaging types and processes. Key benefits include:

Dansensor's Checkpoint 4 and Checkmate 4: revolutionizing MAP analysis for O2/CO2/N2

- Removable/ swapable sensor module, reducing downtime for repairs (get up and running in 10 minutes after breakdown!)
- Ability to run samples with vacuum
- Storing test settings for up to 1,000 custom products

Designed for busy QCs, the Checkmate 4 is fast, repeatable, and highly reliable, ensuring smooth operations without delays.

With these two new solutions, Dansensor has made MAP analysis simpler, more accurate, and more cost-effective. The Checkpoint 4 and Checkmate 4 are must-have tools for any company looking to improve quality control and reduce operational costs.

SureTrend® All-in-One food safety analytics

Hygiena

In the fast-paced and highly regulated food industry, maintaining stringent safety and quality standards is crucial. SureTrend® all-in-one food safety analytics software by Hygiena® is designed to meet these demands, ensuring that your facility is always audit-ready. This powerful tool integrates a wide range of food safety data, from ATP and pathogen testing to allergen detection and environmental monitoring, into a single, user-friendly platform.

SureTrend offers unparalleled visibility into your food safety processes, allowing you to monitor, track, and trend test results across multiple facilities in real time. With its advanced data analytics capabilities, the software transforms raw test data into actionable insights, helping you identify potential risks before they become critical issues. Whether you're conducting regular hygiene checks or preparing for a comprehensive third-party audit, SureTrend ensures that all relevant data is at your fingertips.

The platform's cloud-based architecture, powered by Microsoft Azure, guarantees that your data is secure and accessible from anywhere. This flexibility not only simplifies the management of food safety protocols but also streamlines compliance with global food safety standards such as HACCP and GFSI. Automatic updates ensure that you are always using the latest version, while encrypted data storage provides peace of mind that sensitive information is protected.

For food manufacturers and processors aiming to stay ahead in a competitive market, SureTrend is the ideal solution to enhance food safety management. By leveraging cutting-edge analytics and robust data integration, you can confidently navigate the complexities of food safety audits, reduce the risk of contamination and ensure consistent product quality.

Stay audit-ready and safeguard your reputation with SureTrend—the future of food safety analytics.

For more information, visit Hygiena's SureTrend page.

Put your data to work

Neogen Analytics

Routine product testing and sanitation monitoring on a production line results in the accumulation of a lot of data. Surprisingly, it is still very common for this data to be buried in paper files or spread sheets, to be retrieved only when demanded by an audit or if contamination issues are discovered.

When this data is required, manual retrieval is often laborious and takes key personnel away from more productive tasks. Delays of any kind will cost a business real money.

Your data doesn't have to lay dormant. You can make it work for you and gain real-time insights, improve your responsiveness, simplify compliance, reduce risk and increase your productivity.

Neogen Analytics has been developed as a fully integrated food risk intelligence solution to streamline your environmental monitoring, product testing, and sanitation verification programmes. It incorporates data from testing, labs, LIMS, and devices, all on one platform to allow you to manage multiple workflows efficiently and effectively.

Colour-coded test points on your floor plan enable you to visually assess the state of your plant at a glance. You can easily generate schedules to support your company's environmental testing plan, and with all your testing and corrective action data in one spot, you can filter and print what you need for any audit in minutes.

Neogen Analytics employs rules-based triggers to analyse diagnostic results and alert stakeholders to anything that requires their attention, allowing corrective action to commence immediately. Wastage and downtime are reduced, and your team can identify the root causes and trends that lead to issues in the first place.

It's time to replace time-consuming, repetitive, error-prone food safety tasks with automated workflows, instant notifications, and unparalleled insight. Take the headaches out of compliance activities and deliver real efficiency by putting your data to work.

Metrohm

– robust, sensitive and efficient instruments

Metrohm New Zealand provides experience and knowledge to the food and beverage industry, earned through years of supporting customers with a complete line of robust, efficient, and sensitive instruments.

Here are 4 ways to optimise your food analysis using Metrohm instruments.

1. Salt Analysis – Metrohm provides a cost-efficient, fast sodium analysis with the Eco Titrator system. The Eco Titrator Salt plus analyses chloride in a wide variety of food samples.

2. Allergen Testing Solutions – With the range of enzymatic/chemical test kits from BioSystems you can now test your food and beverage production for a wide range of constituents. ELISA kits analyse the presence of substances at very low concentrations, due to the specificity of antigen-antibody binding reactions.

3. Importance of homogenisation. RETSCH offers a variety of mills and grinders suitable for the different requirements of food analysis.

4. Qualitative and quantitative analysis – Composition and authenticity of food products can be done non-destructively with Raman spectroscopy. Examples include the presence of contaminants in food, identification of food additives, and ingredients including cellulose, sorbitol, stearic acid and starch and also fatty acid composition in food products and flavours too.

Oils and Fats News

Laurence Eyres FNZIFST

A regular roundup of news and opinion from the Oils and Fats Group of the New Zealand Institute of Chemistry.

Remnant Cholesterol, what is it?

Research has consistently shown a correlation between conventional lipid parameters, arteriosclerosis, and cardiovascular diseases. Guidelines highlight the importance of targeting low-density lipoprotein cholesterol (LDL-C) for primary and secondary prevention of cardiovascular diseases, with reducing LDL-C being still the primary lipid-lowering strategy. However, even when LDL-C is lowered to optimal levels, there is a residual risk of cardiovascular disease. Recent findings have brought attention to remnant cholesterol (RC) as a significant factor contributing to this residual risk. The close association between RC, arteriosclerosis, and cardiovascular diseases presents exciting opportunities for lifestyle interventions and medical treatments to control and lower RC levels, offering new targets for preventing and managing related cardiovascular conditions. Remnant cholesterol is what's left after accounting for HDL and LDL.

The USA advise total cholesterol below 200 mg/dl and LDL below 100 mg/dl. To convert mmol/l (NZ) to mg/dl (USA) we multiply by 38.66. To convert mg/dl (USA) to mmol/l (NZ) we divide by 38.66. Hence 200 mg/dl equates to 5.17 mmol/l and 100 mg/dl equates to 2.58 mmol/Australia favours total cholesterol below 5.5 mmol/l (213 mg/dl).

Do you know your lipid analyses? It pays to.

Omega-3 Supplements

Changes in quality over 40 years

My friend Dennis Karl and I got a leave pass from the bosses to attend an American Oil Chemists Society (AOCS) Omega-3 seminar in Hawaii (1986) almost 40 years ago in May 1986.

We had a great time and drove to the top of an active volcano, Haleakala, which had been free from erupting, making it the one of the most accessible and interesting volcanos in the world We visited the summit/cone with a hire car full of people, and in fact being young and adventurous we drove to the top. Dennis Karl has shared some of his photographs with us. (See overleaf.)

Several visiting famous lipid speakers like Dr. Reg Saynor were crammed in the back and were glad of two loopy Kiwis to drive them to the top.

Back to the reason for our visit.

The lectures and meetings were tremendous. These were pathfinding days with people like Professors Bob Ackman and Robert Gibson giving pioneering lectures on the benefits of Omega-3. Omega-3 was still in its infancy in those days and the use of supplements was just growing. I gave a paper on orange roughy oil and squalene. Note that in 1986 the presentations were on 35 mm mounted slides. It was just before the dawn of PowerPoint. Some highlights of the conference were:

- Key principles in preparing low oxidized and stable omega-3 oil.
- Reasonable quality raw fish oil free of moisture and iron contamination.
- Modern refining using chelating agents, active bleaching agents and low physical refining temperatures.
- Adding citric acid and antioxidants at the appropriate time in the processing.
- Effective use of nitrogen sparging and oxygen barrier packaging.
- Clinical studies on the effect of dietary n-3 and n-6 fatty acids on serum lipids, haemostasis and GTN consumption.
- *Proceedings: R Saynor, T Gillott, T Doyle, D Allen, P Field, M Scott - 1986 - cabidigitallibrary.org AOCS Workshop. Marine lipids and EPA, Hilo, Hawaii*

Anti-inflammatory medicines and pain

From a personal point of view, pain management is so important as we get older. Sadly, the most potent of the effective painkillers such as diclofenac (Voltaren and Celebrex etc.) cause liver damage if taken over a prolonged period. It always pays to review with your doctor the risks and benefits of taking any medication. Omega-3 does partly alleviate the pain but not completely. Ethanol works but unfortunately also has major side effects.

Olive oil shortages and replacements

Europe has seen a major shortage of decent quality olive oil due to crop failures and the weird weather. As far as I am aware Australasia has not seen such shortages. If not olive oil (decent quality) what else should you use? Options are avocado oil, hazelnut oil and canola (NZ).

An interesting YouTube video is at https://www.youtube.com/watch?v=BiKGydHNjGc. Thanks to Geoff Webster

High quality boutique oils

Over the last 20 years New Zealand has seen the emergence of some niche boutique oils. Examples of these virgin oils are flaxseed oil, hemp

Photographs of Haleakala Volcano on Maui, including lava in the crater, taken in 1986 when Laurence and colleagues were on Maui for an AOCS conference. From the album of Dennis Karl

seed oil, walnut oil, hazelnut oil, and locally grown canola oil. Many of these oils come from NZ South Island crops and are produced locally. They tend to be higher priced than imported oils but at least they are fresh and not fraudulent.

Dangers of used cooking oil

Repeated heating of vegetable oils at elevated temperatures during cooking is a quite common cooking practice. Repeatedly heated cooking oils (RCO) can generate varieties of compounds, including polycyclic aromatic hydrocarbons (PAH), some of which have been reported as carcinogenic. RCO is one of the commonly consumed cooking and frying media. RCO consumption and inhalation of cooking fumes can pose a serious health hazard. Consuming deep-fried oils has been linked to oxidative stress and inflammation, which are risk factors for neurodegenerative diseases and other chronic conditions.

- A new study in rats suggests a potential connection between the long-term consumption of reheated cooking oils and increased neurodegeneration.
- The gut-brain-liver axis appears crucial in maintaining neurological health, and consuming reheated oils may disrupt this balance.
- Experts recommend diets rich in antioxidants and omega-3 fatty acids, cautioning against the frequent consumption of fried foods.

The use of adsorbent powder to clean up frying fats is being touted as a wonder process. The commentary is in Israeli which makes it fascinating. It is nothing new.

NZIFST conference 2025

We are expecting two overseas scientists working with Professor Marie Wong and her PhD student. A session at the conference is being planned. Watch this space.

Trivia

My family think me somewhat eccentric for having oils and fats as a hobby. However, I have been well exceeded by a Dane, Professor Steen Stender. He has – for professional purposes – been a collector of cake wrapping paper, in folder after folder, country after country He has accumulated 5,000. The cake wrap is a part of the story of the harmful trans-fats, or trans-unsaturated fatty acids, which have been banned in Denmark since 2004, but until then were found in lots of things, including margarine – and, but absorption, on cake wrapping paper.

Overview: Ingredients

Time to explore the burgeoning world of ingredients: flavours, colours, nutrients, modifiers. You name it, it's here.

BENEO

Great taste and nutritional value smartly combined

In recent years, plant-based "milk" has become a staple food for many consumers, whether as a genuine alternative or as a supplement to cow's milk. As this segment matures, consumers are becoming more demanding in terms of nutritional value and flavour experience. Beneo offers various solutions that fulfil all these requirements.

Achieving pleasant textures and taste with faba beans

Faba bean is a source of dietary fibre, protein, and starch, as well as vitamins and minerals. Beneo's faba bean concentrate boasts a 60% protein content, making it a healthy and nutritious enhancement to plant-based drinks. Beyond their nutritional benefits, faba beans offer a host of textural advantages. Their high solubility creates a beautifully homogenous and stable drink with a pleasant texture and good taste.

These properties allow food developers to ensure a smooth beverage texture with no sediment or sandy mouthfeel. In addition, faba protein has good emulsifying and foaming properties, which is useful for preparing plant-based drinks such as vegan cappuccinos with dairy-free coffee creamer.

Enhancing plant-based beverages with barley beta-glucans

Beta-glucans from the ancient grain, barley are valuable dietary fibres. Orafti® βFit is a wholegrain barley flour, rich in beta-glucans, offering various health advantages, including helping to reduce blood cholesterol levels, supporting cardiovascular health, contributing to improved blood sugar levels, and promoting digestive health.

Orafti® βFit also scores with its textural properties. Its solubility, clean taste, neutral colour, and temperature stability enable food manufacturers to incorporate the ingredient in a wide variety of food applications.

The plant-based industry will continue to make its mark in Asia Pacific's F&B landscape. In order to keep the pace, food developers must be agile, and be able to adapt to evolving consumer preferences. Using ingredients such as faba beans and barley beta glucans, a wide range of plant-based beverages can be made available — that not only fit the nutritional needs of consumers, but also meet taste and texture expectations.

Langdon

Langdon's pantry is brimming with high-quality ingredients for both function and flavour, cultivated over 170+ years to provide customers with access to a global larder. Their curated pantry, sourced from leading producers, includes premium herbs and spices, IQF ingredients, flavours, functional ingredients and much more. Langdon is constantly on the lookout for innovative ingredients, ensuring they support their customers by staying ahead of the curve in meeting future trends and consumer demands.

Their Individually Quick Frozen (IQF) products are a standout, helping manufacturers achieve consistent flavours, appearance, nutrition, and functionality while aligning with key consumer trends like health, global flavours, and cost-effectiveness. IQF technology offers a convenient solution for food manufacturers by preserving the nutrition, flavour, and aroma of ingredients while enhancing ease of use, consistency, availability, and shelf life – potentially even reducing food waste.

Even seemingly modest products such as egg powder, play a crucial role in Langdon's offerings. These versatile and cost-effective alternatives to fresh eggs – available in barn-laid and free-range options – retain all the nutritional benefits of fresh eggs while ensuring consistency in taste, colour, and functionality. Langdon provides whole egg, egg yolk, and egg white powders, catering to a wide range of applications.

Beyond their practical solutions, Langdon offers an extensive array of ingredients that elevate flavour, colour, and aroma. Their selection of named chilies adds a vibrant kick to dishes, while fragrant spices and aromatic herbs can transport consumers to distant lands, offering a sense of culinary adventure and virtual travel through their food. Langdon's commitment to quality and innovation makes them a go-to supplier for manufacturers seeking to create exceptional products.

E 1852

LANGDON

A WORLD OF TASTE

CELEBRATING 30 YEARS · 30 · TE WHAKANUI I TE 30 TAU

30 YEARS SUPPLYING NZ FOOD MANUFACTURERS

Spirit of Family
Nimble & knowledgeable local team

Local Knowledge
Global expertise in sourcing

Breadth of Pantry
Consistently reliable products

Product Development
Solutions focused, trend forward

At Langdon we have a **rich history** of sourcing the **finest ingredients** from across the world, for 172 years.

Discover how we can help you take your **innovative product ideas** all the way from **conception** to **shelf**.

hjlangdon.com

LEARN MORE ABOUT LANGDON.

A vibrant rainbow of plant-based colours

EXBERRY® colors

Created from fruit, vegetables, and plants, EXBERRY® colours can be used to deliver a full spectrum of bright shades in almost any food and beverage application.

RED: EXBERRY® reds are made from raw materials including sweet potato, black carrot, and blackcurrant. They can be described on labels using simple descriptions such as "carrot and blackcurrant concentrate".

ORANGE: EXBERRY® can deliver orange shades using clean-label concentrates made from raw materials including paprika and carrot. EXBERRY® Annatto, meanwhile, is an oil-soluble natural option with high intensity.

YELLOW: Yellow concentrates can be made from raw materials such as safflower, pumpkin, and turmeric. They contain a variety of pigments and support simple label declarations. EXBERRY® Carotenes are made from algae and are available in multiple formats for different application needs.

BLUE: The superfood spirulina can deliver vibrant blue shades in food and drink. It can be described as "spirulina concentrate".

GREEN: By blending spirulina with yellow raw materials, it is possible to achieve vibrant shades from turquoise to lime green in a wide range of applications.

PURPLE: Purple concentrates are made from raw materials including carrots and blueberries. It is also possible to achieve purple and lavender hues by mixing spirulina with red and pink colours.

PINK: Sweet potato and carrot can provide an excellent clean-label option in low-pH applications. Beetroot concentrates can offer an alternative for pink and are labelled as "beetroot concentrate".

BROWN: Concentrates based on caramelised carrot are effective in most applications. Alternatively, brands can use apple and hibiscus concentrates or a blend of carrot, safflower, and spirulina.

GNT can help you find the perfect solution for your project. With a vast portfolio of plant-based EXBERRY® colours, it's possible to create spectacular food and drink with the natural ingredient lists consumers want to see.

Freemen Nutra

Think of an ingredient – any ingredient

Freemen Nutra is committed to helping our clients in the food and beverage, dietary supplement, personal care, and animal nutrition markets to bring their innovative ideas to life. Our exceptional, ethically sourced ingredients provide the solutions your brand needs to enhance its products' performance, taste, and nutritional benefits.

Freemen Nutra's top categories are vitamins, sweeteners, food & beverage ingredients, minerals, amino acids, joint health, plant proteins, healthy fats, pre-blends. Our top products are Vitamin Series B (1, 2, 3, 5, 6, 7, 8, 12) C, D, E, K, Inositol, Caffeine, Creatine, Citric Acid, Malic Acid, Sorbic Acid, Taurine, Sucralose, Stevia, Glucosamine, Collagen, Chondroitin and CoQ10.

Freemen Nutra pride ourselves on market intelligence, partnering with our customers to communicate what's happening in the ingredient market, by way of pricing and availability trends, to enable sourcing of high-quality ingredients, at the most effective prices. Examples of current market movers are:

Ascorbic Acid. This product is coming off a market low in Oct '23. Chinese factories have closed for 3 months' summer maintenance. This ingredient price is going to be increasing throughout this year.

Vitamin A and E. Due to the explosion at the BASF factory in Ludwigshafen Germany on July 29th, the markets of food and feed grade are expected to rise in the short term.

From specific ingredient orders to custom premix blends and innovative ingredients, Freemen Nutra's seamless global supply chain and product portfolio brings you the products you need with a competitive and efficient guarantee. We have partnered with key global manufacturers for over 25 years.

Freemen Nutra has warehousing in Brisbane, Auckland, Sydney and Melbourne. Please get in touch to reduce your ingredient costs, source the latest trending ingredient samples and experience efficient customer service.

Alchemy Agencies

Employee owned, customer focused

Alchemy Agencies is an employee owned company that has served the New Zealand food and beverage market since 1996. We are a growing team of respected industry professionals who are committed to bringing innovative products to the market and who partner with customers and suppliers to develop unique and novel products that offer a point of difference. Technical advice, flexibility and speed of response are key attributes.

Alchemy is committed to the safety and well-being of all those associated with our business and work to ensure the sustainability of the environment in which we operate. Alchemy's Quality Assurance Manager is tasked with ensuring food regulatory compliance whilst the HSE Manager ensures health, safety, and environmental compliance across all aspects of the business.

Transparency regarding the suppliers we represent is a core value.

Alchemy Agencies services all areas of the food and beverage industry, including dairy, beverages, condiments, confectionery, desserts, snacks, and bakery products. We partner with recognised manufacturers such as Agrozzi, Conesa, Ingredion, Scelta, Nutrium, plus more, to supply high quality ingredients. Additionally, we support growing wellness and fortification markets with partners like Stern Vitamin, PB Leiner, OmniActive, Ashland, ACG Capsules and New Bellus.

Alchemy Agencies also offers custom-made vegetable preparations from Farm Fresh Fine Foods and support the beverage industry with stabilisers from Ashland, plant-based gums from Ingredion, hops from HVG, kegs and alcohol.

New Zealand-owned; Dunninghams

Dunninghams is proud to be 100% New Zealand owned and operated, a fourth generation family owned business, trading for over 100 years! We continue to evolve as a company that meets a wide variety of needs across many segments of the food industry, both within and beyond New Zealand's shores. While still catering to our loyal butchery customers, Dunninghams also provides quality solutions to meat and fish processors, distributors and food service networks.

Ingredients

Now representing Baker & Co in the New Zealand market offering an extensive range of flavours, oleoresins, essential oils and natural colours.

Products are stocked in New Zealand and are available in one pack minimum order quantities. Paul Cheater is your contact at Dunninghams.

Batch blending

Did you know at our Auckland manufacturing site in Penrose we batch blend ingredient products for our customers e.g. sausage meals, glazes, pattie mixes, sous vide mixes, concentrates, brine mixes, cures, coatings?

We can batch blend a customised, or special blend, or unique recipe for you and the minimum order quantity can be as low as 40kg. We can even tweak one of your favourite Dunningham recipes and add your special additions in it, so you save time, don't have to stock the raw material additions and ensure your product consistency.

If batch blending is of interest to you we can help. Our team members will contact you.

Food service packaging

Dunninghams now has a dedicated Food Service Packaging sales team. We stock environmentally-friendly and home compostable product options with an ever-expanding range of new products arriving monthly. Please contact your Dunninghams' sales representative or Customer Services.

We're proud that our environmental efforts have awarded us with Toitū gold and carbon reduce certifications as well as our Telarc food safety FSSC 22000 certificate.

Sherratt Ingredients

Allulose: A natural, low-calorie sugar alternative

Allulose is quickly gaining attention as a low-calorie, sugar-like alternative sweetener. Unlike high-intensity sweeteners that can leave a lingering, bitter aftertaste and lack bulk, allulose offers a sweet, refreshing taste and replicates sugar's bulking and browning properties. This makes it ideal for reduced-sugar foods without compromising taste or texture.

Classified as a "rare sugar", small amounts can be found naturally in fruits or crops such as sugar beets, figs and grapes. It has similar characteristics to fructose. Allulose offers 70% of the sweetness of sugar, and with only 0.4 calories per gram and it doesn't impact blood glucose (sugar) levels, making it useful for diabetic and keto-friendly products.

Recently approved as a novel food by Food Standards Australia and New Zealand (FSANZ), Nexweet® Allulose can now be used in manufactured food products. It is available to New Zealand food and beverage manufacturers exclusively through Sherratt Ingredients.

Nexweet® Allulose is made from fructose syrup using enzyme technology developed by Samyang Corporation, with no chemical processing. Samyang offers allulose in both syrup or crystalline form under the name Nexweet®.

Nexweet® Allulose is a low-calorie sweetener suitable for use in no-added sugar and zero-calorie products, with a different sweetening and taste profile compared to high-intensity sweetners like Stevia and Sucralose. Nexweet® Allulose is ideal for adjusting taste profiles, masking aftertaste and enhancing texture in various products.

Additionally, Nexweet® Allulose maintains product integrity across a variety of applications – keeping snack bars soft, enhancing browning in baked goods, preserving original colour in beverages, preventing recrystallisation in gummies, improving emulsion stability in plant-based milk, and retaining fruit shape in jams and fillings due to its high moisture retention.

Our team at Sherratt Ingredients can provide information and advice on the characteristics and application of allulose. Sherratt Ingredients is a New Zealand owned and operated business providing quality speciality ingredients and bespoke solutions to food and beverage manufacturers. Samyang Corporation is part of our global network of trusted ingredient suppliers.

Oterra

Since 1876, Oterra has been at the forefront of providing naturally sourced colours to the world. Rooted in the belief that natural is best, we've harnessed the vibrant hues of nature to enrich food, beverage, dietary supplements, and pet food. As the largest provider of naturally sourced colours globally, our journey has been defined by innovation, sustainability, and a commitment to enhancing consumer experiences.

One such solution is our Jungle Blue, derived from the Jagua fruit, also known as *Genipa americana*, thriving in Colombia's rainforest river valleys. Through our partnership with EcoFlora Cares, we collaborate to harness the amazing properties of Jagua fruit juice for natural food colouring.

Another exciting development on the horizon is the introduction of Arctic Blue by Oterra, a revolutionary natural colourant derived from *Spirulina microalgae*. In partnership with VAXA Technologies, we've harnessed cutting-edge processes to deliver a carbon-neutral solution that integrates a controlled production environment for purity. Crafted amidst the pristine landscapes of Iceland, our product embodies natural authenticity and environmental responsibility, resonating with consumers worldwide.

At Oterra, sustainability isn't just a buzzword – it's the cornerstone of our ethos. We recognise the responsibility we bear towards our planet and future generations. That's why we've dedicated ourselves to sustainable sourcing, production, and distribution practices. From partnering with local farmers to ensure fair trade and ethical sourcing, to implementing eco-friendly manufacturing processes, every step we take is a stride towards a greener future.

Join us on this journey towards natural, where every shade tells a story of sustainability, innovation, and the enduring beauty of nature.

Hawkins Watts: Introducing Chiber™

At Hawkins Watts, we understand the pressures facing today's beverage producers: balancing taste, clean label demands, costs and sustainability, all while maintaining product quality and safety. That's why we're proud to introduce Chiber™, a natural white button mushroom extract from our supply partner, Chinova Bioworks, developed to extend the shelf-life of beverages – without compromising on taste or texture.

Upcycled from mushroom stems, Chiber™ is a clean-label ingredient that protects beverages from spoilage caused by bacteria, yeast, and mould. Its antimicrobial properties work efficiently in the background, keeping your drinks fresher for longer while maintaining their sensory characteristics. For producers, this means preserving the integrity of your product while meeting consumers' increasing demand for natural, transparent ingredients.

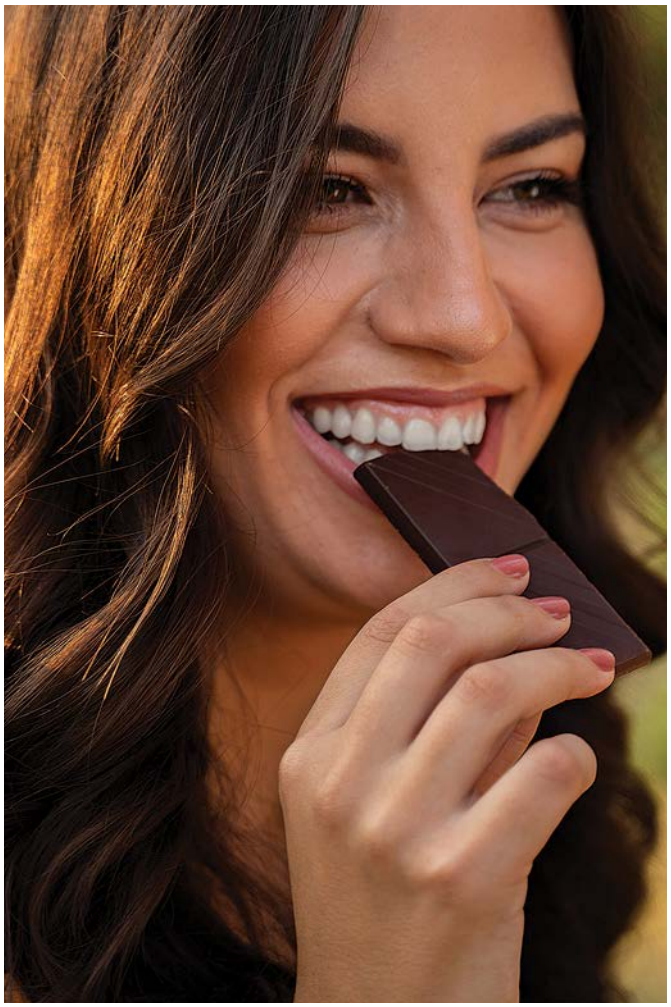
The sustainability aspect of Chiber™ is a key advantage. Using upcycled mushroom stems, Chiber™ helps reduce food waste, aligning with the broader movement towards more responsible production practices. It's a powerful solution for brands committed to both quality and sustainability.

Chiber™ is not just effective – it's also a practical and cost-efficient solution. For beverage technologists and procurement teams, it provides a smart way to extend product shelf-life without incurring excessive costs, making it a valuable addition to any clean label strategy.

In today's competitive market, Chiber™ offers a forward-thinking approach to natural preservation – delivering shelf-life, sustainability, and product quality in one simple, effective ingredient.

To discover more about the benefits of Chiber™, reach out to our team at Hawkins Watts.

Chiber™ is a natural white button mushroom extract developed to extend the shelf-life of beverages



Sensus

Sensus is a leading supplier of chicory root fibre, also called inulin or oligofructose. This prebiotic dietary fibre from a natural source is perfect for food manufacturers seeking clean-label solutions to make healthier foods. Frutafit® inulin and Frutalose® oligofructose are plant-based dietary fibres widely used to reduce sugar or fat, add fibre, and improve texture without sacrificing quality. They support digestive health by boosting beneficial bacteria in the colon, with chicory inulin recognised by ISAPP as the only plant-based prebiotic.

Given the rising demand for healthier food options, chicory root fibre stands out as an excellent sugar substitute. It can replace sugar in a 1:1 ratio, retaining the functional roles of sucrose such as bulking and enhancing mouthfeel. Our unique natural soluble fibre portfolio offers up to 60% sweetness, and thereby chicory root fibre delivers a clean and similar taste, closely matching sucrose's properties without necessitating changes in production processes. Its versatility is evident across dairy, bakery, cereals, infant nutrition, beverages, confectionery, ice cream, savoury products, and healthcare nutrition, making chicory inulin an inspiring ingredient for creating healthy and delicious products.

Moreover, Frutafit® and Frutalose® enhance the nutritional profile of products while maintaining desired taste and texture. As consumers become increasingly health-conscious, the demand for products that offer both functionality and health benefits is growing. Incorporating chicory root fibre into food formulations helps in reducing sugar content and adds dietary fibre, boosting a healthy microbiome as a prebiotic and contributing to overall well-being. This makes chicory inulin a game- changer in the food industry, providing manufacturers with the opportunity to meet consumer demands for healthier, tastier options.

Embrace the future of sustainable food innovation with chicory root fibre and stay ahead in the market by offering products that not only taste good but also promote health and wellness.

Sensient Technologies

Celebrating forty years of manufacturing in New Zealand

Sensient Technologies New Zealand is celebrating our 40th year of supporting the New Zealand food and beverage industry with local manufacturing.

Throughout those 40 years, Sensient has seen many changes within the industry and within the business. What has stayed true is our commitment to supporting food and beverage manufacturers with formulation development, short lead times, small MOQs, and ultimately, helping New Zealand food and beverage thrive!

Sensient New Zealand takes international trends and technologies from our company's global resources and transforms them into local products, concepts and innovations for our New Zealand customers. We take your taste from "meh" to "mmmm". The team at Sensient are experts in the science, art and innovation of taste. We are market-savvy, problem solvers, who are as passionate about your products as you are!

If there's anything we're more passionate about than flavours and colours, it's partnership. We love nothing more than collaborating with our partners, as together, we can solve the most challenging

product puzzles, and make food and beverages that are delicious, craveable and truly inspired.

Sensient Technologies New Zealand is looking forward to the next 40 years supporting local manufacturing!

Pacific Flavours & Ingredients supplies functional mushroom extracts sourced from carefully selected mushrooms like Lion's Mane

Functional ingredients for health-conscious consumers

At Pacific Flavours & Ingredients, we're all about meeting the growing demand for healthier food and beverage options. With more consumers prioritising wellness, we're excited to offer a range of high-quality, natural and functional ingredients to meet this demand. From natural sources, here's a glimpse into what we are doing in this area.

Standouts in our lineup are our functional mushroom extracts. Sourced from carefully selected mushrooms like Reishi, Lion's Mane and Chaga, these extracts are packed with bioactive compounds that can support immune health, cognitive function and help manage stress. Whether you're adding them to beverages, snacks or supplements, our mushroom extracts deliver serious wellness benefits, making them a go-to for brands focused on holistic health.

As well as our Naticol Premium Fish Collagen from France we also offer OmniCol™, a pure bovine collagen protein with a clean flavour profile that blends effortlessly in most applications, including cold water. While predominantly Type I collagen OmniCol™ also contains types II & III collagens. OmniCol™ brings a host of health perks, from supporting joint flexibility and muscle maintenance to enhancing skin health, making it a perfect fit for products geared towards health-conscious consumers.

Pacific has recently partnered with Biome Centric (AU). Most of us know the importance of a diverse and balanced microbiome for our health, and Biome Centric specialises in pro- and post- biotics to support both the gut and skin microbiome.

We also represent IgY Life Sciences in NZ, offering ultra-high purity Muno-IgY, an antibody with proven health benefits in gut health and supporting healthy immunity. Extracted from hens' egg yolk, IgY latches onto and removes pathogens while sparing beneficial microbiota at a gut level, supporting the body's natural immune system for better defence. One serve of Muno-IgY containing quadrillions of antibodies!

If you're looking to add something special to your product lineup, we have a constantly evolving range of ingredients to help you create something truly unique. If you're ready to find out more visit us in Auckland and let's make it happen!

The secret ingredient to healthier lifestyles

Tate & Lyle

Looking to develop healthier, tastier food and beverage products? Our team of experts are here to help you with ingredients and solutions that will elevate your product lines.

Our fibre portfolio gives formulators the toolkit to develop healthier, tastier products from high-fibre protein bars, beverages, cereals and snacks to indulgent treats and frozen desserts, guaranteed to satisfy consumers' growing desires for healthier living.

Consumers will enjoy the same taste and texture in food and beverages they're used to with added health benefits such as calorie reduction, increased satiety plus a low glycaemic impact to help with weight management.

Sta-lite® Polydextrose is the ideal low-calorie and reduced-sugar ingredient, providing an excellent source of fibre with the same mouthfeel and texture of sugar. It has minimal impact on colour and flavour, plus helps promote lowered post-meal blood glucose when used as a sugar replacement in "low sugar" and "no sugar added" foods and beverages.

Promitor® soluble fibre has exceptional process stability to high heat plus low pH, superior digestive tolerance vs Inulin, plus can be added to foods without altering taste, texture or colour. It has a FSANZ notified self-substantiated health claim for a prebiotic benefit.

Euoligo® Fructo-Oligosaccharides is the best prebiotic soluble fibre for sugar reduction because it comes closer to sugar in molecular composition and thus functionality. Euoligo® FOS also helps deliver a soft texture throughout shelf life while controlling texture in protein bars.

Gosyan® Galacto-Oligosaccharides is a prebiotic soluble fibre resembling oligosaccharides occurring naturally in human milk produced from lactose.

Tate & Lyle fibres have demonstrated benefits in maintaining healthy digestion plus enhancing calcium absorption and retention for bone health. We're continuing to invest in research exploring potential additional health benefits such as immunity and cognitive health.

We have over 100 years of experience in food and beverage formulation backed by scientific research and testing. We are innovators who can help solve your formulation needs and enhance your product lines with insight plus application development, with class leading ingredients.

Formula foods

A passion for flavour

In a world where sensory experiences define our choices, the role of flavours, colours, and ingredients cannot be overstated. Enter Formula Foods, a business dedicated to the art and science of enhancing these sensory elements. With a deep-rooted commitment to innovation and quality, Formula Foods is not just a manufacturer but a creator of experiences that delight the senses and elevate everyday products.

At the heart of Formula Foods is a passion for flavour. Understanding that flavour is not just about taste but an intricate interplay of smell and sight, and even sound, they have honed their expertise to create nuanced, memorable flavours. Formula Foods' flavourists are maestros in their field, combining art and technology to craft flavours that resonate.

Colours play a crucial role in how we perceive and enjoy food. They can evoke emotions, create appeal, and even influence taste perceptions. Formula Foods offers a spectrum of colour solutions that are both vibrant and natural. Formula Foods ensures that every hue not only looks appealing but also meets the highest standards of safety and stability.

Beyond flavours and colours, Formula Foods is a trusted source for a variety of essential ingredients that form the backbone of culinary creations. From emulsifiers that ensure perfect texture to preservatives that extend shelf life without compromising on quality, their ingredient solutions are designed to meet the diverse needs of the food and beverage industry. Each ingredient is meticulously sourced and tested, reflecting Formula Foods' commitment to excellence and reliability.

We see our relationship with clients as a partnership. The business works closely with food and beverage manufacturers, providing tailored solutions and collaborative support to ensure every product is a success.

In the intricate world of food and beverage manufacturing, Formula Foods stands out as a beacon of quality and innovation. By focusing on the sensory aspects that matter most – flavour, colour, and ingredients we not only enhance products but also help create unforgettable experiences. We continue to lead the way in shaping the future of the food and beverage industry.

What technologists do in the shadows

Allan Main, malt whisky enthusiast

Water of life

Those who know me well know that I have a passion for usquebath, Scottish Gaelic meaning "water of life", the divine liquid gold that was anglicised to "whisky" in the 16th century.

Born near Aberdeen in Scotland, it is probably predictable that I would gravitate to appreciating malt whisky despite emigrating to New Zealand at age three. However, my love for whisky came late. My father was a regular imbiber but whenever I joined him in a glass, I would be left with a fiery case of heartburn that overrode the enjoyment, even when cut with water or, sinful, lemonade. For years when I joined my dad in a drink, his would be blended whisky and mine would be gin. However, when I got together with a group of his mates to celebrate his life post-funeral, it had to be done with the spirit of Scotland. I bought a single malt (Strathisla) from Aberdeenshire, my parents' stomping ground, discarded the cork and we six consumed the bottle. Magically the fiery gastric consequences I was anticipating did not eventuate; it was as though my father had bequeathed his tolerance to me. The reality was substantially more mundane. Whereas my father's whisky taste was a basic blend, I had bought a good quality single malt (more of that distinction later) to pay him due homage. I had discovered that the quality of the whisky was a material factor in my response.

From that day forward it was single malt whiskies for me. Not counting duplicate bottles, today I hold 72 single malt whiskies in my cabinets (yes, plural) with as many as eight different variants from a single distillery ("expressions" in whisky parlance). About half my collection hails from the inner Hebridean island of Islay (pronounced "ai-lah"), which region generally provides a more extreme style with heavy peat impact. The whisky count in my collection is significant; when I turned 60, I promised myself I would always have more whiskies in my collection than my years on this Earth. Having experienced my 71st birthday earlier this year I am barely compliant with that promise and will need to source an additional expression before 2025 dawns.

Whisky or Whiskey?

That preface provides a useful scene-setter for a quick tutorial on what constitutes whisky and to resolve a few misconceptions and confusions.

"Whisky" or "whiskey"? Actually, that should read "whisky AND whiskey" as both are correct. Key to the distinction is the country of origin. All spirits distilled in Scotland carry "whisky" (without the "e") as their valid spelling. Canada, India and Japan, whose industries derive largely from the Scottish tradition, also adopt the "whisky" spelling. Products spelled with an "e" ("whiskey") implies predominantly traditional Irish origins, particularly Ireland, American (and Australasian). A further grammatical oddity applies to the plurals with more than one "whisky" being "whiskies" and the plural of "whiskey" being "whiskeys".

And there's more

"Single malt" whisky or "blended" whisky? This is another source of confusion. Malt whisky is the foundation of the Scottish whisky industry and derives exclusively from barley-malt. A "single" malt whisky is one that exclusively hails from just one distillery, and generally bears the name of that distillery (which frequently is named for its location). While a single malt likely comprises liquor from multiple runs and possibly barrel types, to qualify as a single malt these must all hail from the named distillery. That is not a restrictive factor in building my collection; there are over 150 (and increasing) distilleries in Scotland, with each usually marketing multiple expressions (ages, barrel type, degree of peat, etc) all produced exclusively in that one distillery. Prominent single malt brands include Glenfiddich and Glenlivet (Speyside), Springbank (Campbeltown), Glenmorangie (Highland), Auchentoshan (Lowland) and Lagavulin (Islay). Much is made of the five regional designations (per those parentheses). With the possible exception of Islay which is largely defined by its heavily peated character, my personal experience is that there is as much style variation within regions as between regions. The geographical regions probably showed greater style consistency in the earlier days when whisky distilling was legalised (just 200 years ago in 1823) but today technology and the innovation drive enables greater variation to be expressed within a geography. If that is the basis of "single" malt, what if these are mixed together? Does that constitute a "blended whisky"? No, these are not the spirits termed "blended whisky" but rather are "vatted malts". The term "blended whisky" is reserved for a liquor in which neutral spirit (i.e. relatively pure ethanol derived from carbohydrate sources other than malted barley) is used as a component of the blend recipe to stretch the more expensive malt whiskies. Thus a "blended whisky" is a vatted malt whisky extended with neutral spirit. The legal requirement is for as little as 20% of

Allan being fitted for his Clan Gunn kilt during a recent trip to Aberdeen

the alcohol in a blend to source from malt whisky, but most quality brands are generally a maximum of 50% neutral spirit. Some well-known examples of blended whiskies are Chivas, Johnnie Walker, Monkey Shoulder, Cutty Sark and Teachers, my father's go-to, which was fitting given teaching was his profession.

So, what is "Scotch"?

An intriguing question! "Scotch", in the whisky context, is a whisky of exclusively Scottish origin. While some hold that "Scotch" is a generic adjective meaning "of, or from, Scotland", within the Hebridean nation "Scottish" is the preferred descriptor. Indeed, many (including me) find it offensive to be called "Scotch" with "Scottish" or "Scots" the appropriate nomenclature. "Scotch" has been adopted overseas as a generic term for Scotland's whisky, particularly blended, to distinguish it from whisk(e)y from elsewhere. That use is tolerable to most Scots an provides the only acceptable use of "Scotch". However, if ordering at a bar in Scotland one would never request a "Scotch" as it is assumed that in Scotland one should only be drinking the local product. Indeed, it is unlikely that ordering a generic "whisky" would be accepted as specificity of brand is expected. The diversity of product styles requires that one's preference be stated when ordering at a bar, which generally has extensive options, both single malts and blends.

The mysterious craft

How is whisky made? Given the simplicity of the ingredients and process, whisky diversity is astounding. Malt whisky is the product of just 3 ingredients – malted barley, water and yeast, and the process is equally simple – make (un-hopped) beer then distil the alcohol from that beer. Yet from that simple concoction derives a plethora of organoleptic experiences that makes each whisky subtly unique. The sensory tapestry of a whisky is woven from threads of its ingredients, process and aging with each option exercised impacting the appearance, odour ("nose"), and flavour of the resultant spirit.

Malted barley

Ingredients impact the character of the resultant whisky. Malted barley, the sole carbohydrate source allowed, is produced by steeping then sprouting viable grain in a humid room ("maltings floor"). This causes enzymes native to the grain to convert starch to fermentable sugars. Once the target conversion is reached, usually determined by the extent of sprouting, the malt is "fixed" by heating to arrest germination before the sugars are used for plant growth. Surprisingly, given its primality in the ingredients, barley cultivar and source is one of the least material impactors on whisky distinctiveness. Handling of the barley at the maltings is more influential than the barley itself, which may explain why Scotland's whisky no longer requires Scottish barley be used. Malt contributes a generic sweetness and, to the extent that the grain is dried over peat fires, a fireside smokiness.

Water

The second ingredient is water used to create a "mash", a dilute porridge, from a "grist" of ground malt. Water is usually sourced from burns (streams) adjacent to each distillery and will take the character of the land it drains. Sometimes the stream bed is stony and the water takes a steely mineral character. In other locations the water is dark and brackish from surrounding peatlands and bogs. Even then there are nuances on peat-sourced water depending on the organic matter that contributes to the bog. On Islay the peat is primarily decomposing heather and is open and fibrous. In the highlands some streams drain dense sphagnum moss swamps and others are fed from

bog woodlands where Scots Pine (*Pinus sylvestris*) predominate. The River Spey, which provides the water for all Speyside whiskies is renowned for its purity and softness contributing little to the flavour so allowing the malt character to predominate in Speyside malts.

Yeast

The third and final ingredient in the brew is yeast, the biological engine that converts malt sugars to alcohol through fermentation. Most distillers use commercially-sourced "M-series" brewing yeast (*Saccharomyces cerevisiae*). Others have developed proprietary strains to enhance their unique style. Glenmorangie, renowned as an innovative producer and one of the most popular malt whiskies in the Caledonian homeland, uses wild yeast strains originally sourced from their adjacent barley fields. As with any fermentation, in addition to ethanol, whisky yeast generates aromatic by-product compounds which may co-distil and provide subtle variations to the aroma and complexity of the bottled whisky. Different yeast strains have a

Allan at his gates of paradise, the entrance to Ardbeg Distillery, number one in his preference list

Left: Malt ready for drying at the Kilchoman farm distillery malting floor

Allan enjoys a dram in the visitor reception at Laphroaig in August 2023

propensity to produce different minor organic compounds, notably non-ethanolic alcohols, organic acids, lactones, esters and aldehydes. The extent to which these compounds distil over with the ethanol is a critical factor in the sensory characteristics of the resultant whisky.

The still

In addition to the ingredients the equipment and process settings impact the spirit's characteristics, finally sealing the distinctive character of the distillate to be matured to whisky. While stills for Scottish whisky are always copper batch pot stills that appear broadly similar at first glance, the form and scale of a still (influenced further by operational settings) governs the nature of the distillate, particularly the minor components (termed "congeners") carried over with the ethanol. Distillers are jealous of their still designs and if expansion is considered, still design is a critical issue. Hence up-scaling is more likely to be achieved by replicating rather than by up-sizing. Each distillery operates its stills in a unique manner and selects the retention and rejection cuts of the distillate according to its own criteria. While whisky is usually double-distilled, occasional distilleries (e.g. Auchentoshan and Benriach) follow the Irish practice of triple distillation with consequent effects on their style.

Aging

Finally, the virgin spirit is aged in wooden casks, almost always second-hand sherry or bourbon (frugality, a renowned Scottish attribute) but other sources may be used to tweak product characteristics. In my collection I have a limited-edition bottle of my favoured Ardbeg finished in New Zealand Pinot Noir barrels, appropriately branded "Ardbeg Blaaaaack". Obviously second-hand casks contribute flavours from their former contents which adds complexity to the whisky. Cask volume – affecting surface area to volume – is a further factor in its contribution with barrels (~200 litres), hogsheads (~250 litres) and butts (~500 litres) typical. Maturation time is another factor in creating a whisky style. By law a minimum of 3 years' storage is required to claim "whisky", but aging 5 years or longer is normal, with 10 years being a typical claimed age on basic expression malt whiskies. Older whiskies are generally more expensive given that storage is costly due to sunk capital but also through evaporation (ullage, "the angels' share" in whisky). The loss is typically one to two percent a year, so each year beyond the minimum three years implies a compounding yield loss.

There is a plethora of other factors (e.g. sea proximity, alcohol standardisation, filtering practices) causing nuanced differences in whiskies such that no two are ever the same, leaving the enthusiast a never-ending abundance of experiences.

Philosophy

Appreciating malt whisky is a journey through history, geography, technology and sensory delight – the perfect pastime for this aging food techie. It is rewarding and fun to explore the variables embedded in each glass of nectar and to apply the disciplines of sensory analysis to such an indulgent hobby.

Next time we are together perhaps you would like to join me in a special dram and we can explore the experience together.

Latest packaging releases from Europe

Koehler Paper's new range of flexible packaging paper specially for tea offers a whole host of options for sustainable tea packaging. Source: Koehler Group

Koehler Paper Presents New Line

Flexible packaging paper specially for Tea

Koehler Paper, part of the Koehler Group, has launched a new high-quality product range specially for tea packaging, offering the perfect solution to high demand for organic tea and sustainable packaging alternatives on the tea market. The different types of flexible packaging paper cover a broad range of requirements – from good knurling and heat-sealing properties with or without a barrier function, e.g. for high aroma protection, to teabag wrapping and flow packs.

"Our flexible packaging paper has a lot of advantages. It is recyclable, offers top product protection, complies with food standards, and is highly compatible with tea packaging machines, offering the same efficiency and speed as plastic film," explains Christoph Wachter, Director of Flexible Packaging Paper at Koehler Paper.

With Koehler NexPlus® Tea Aroma and Koehler NexPlus® Tea Flavor, the company is offering two types of heat-sealable packaging paper with both a grease and oil barrier and a special aroma barrier, which is well-suited for essential oils and aromatic tea varieties. Meanwhile, Koehler NexPlus® Tea Pure and Koehler NexPlus® Tea Coat can be used for heat-sealed teabag wrapping and flow packs with a natural feel or glossy surface. Koehler NexPure® Tea and Koehler NexCoat® Tea Matt are suitable for knurled teabag wrapping where barrier properties are not required.

To directly test compatibility with existing packaging machines, the company is also offering pre-printed rolls as samples for tea envelopes.

NexFlex®

The research and development team from Koehler Innovation & Technology worked with the experts from Koehler Paper to develop the NexFlex® product range, a unique and recyclable generation of flexible packaging paper. The aim here is to replace plastic in packaging by using so-called barrier paper wherever possible. The range covers a broad spectrum. It includes standard coated and uncoated paper used in laminates for pouches, sachets, and other applications, making them suitable for a wide range of packaging for food and non-food products. The next generation of paper for flexible packaging is sustainable barrier paper with functional surfaces for product-specific protection (Koehler NexPlus®). The NexFlex® product family also includes paper coated on one side with good dimensional stability and high smoothness (Koehler NexCoat®), as well as uncoated paper with a natural appearance (Koehler NexPure®).

New products from SÜDPACK

Stand up coffee pouches

The company offers a PP-based concept for packaging coffee in stand-up pouches as a substitute for the usual PET/aluminum composites. "According to our internal LCA calculations, that reduces the carbon footprint of a coffee package by more than 30%," said Valeska Haux, Vice President Strategic Marketing & Sustainability at SÜDPACK. Further advantages are the high material efficiency due to reduced density, optimal barrier properties thanks to the excellent water vapour barrier provided by PP, and outstanding ease of processing, which is down to the thermal resistance.

Multi Peel PET floatable top web

Innovations also include the (Multi-)Peel PET floatable solution. Thanks to its low density, the floatable top web can be separated during recycling from PET trays, producing a clean recycled material flow.

The Multifol Extreme stands out for a low material input. The high-performance flexible film from SÜDPACK is up to 30% thinner than other, conventional PA/PE structures. Thanks to exceptional sealing performance even when contaminated with oil or fat as well as high puncture resistance, Multifol Extreme films are ideal for securely

Multifol Extreme films are ideal for securely packaging greasy, protein-rich products and frozen food in MAP and vacuum packaging

The floatable top web can be separated from recyclable PET trays during recycling

PP based concepts for packaging

packaging greasy, protein-rich products and frozen food in MAP and vacuum packaging.

For producers of nuts, sweet and savoury snacks, as well as spices, coffee, and tea, SÜDPACK also offers a sustainable solution: PP and PE-based, recyclable monomaterials for manufacturing stand-up pouches with or without reclose systems are a sustainable alternative to conventional film structures. For producers and packagers of liquid or pasty foods such as fruit purees, pouches can also be fitted with spouts. Together with the cooperation partners SN Maschinenbau and MENSHEN, SÜDPACK offers an overall concept for easy and reliable in-house production of spouted pouches.

About SÜDPACK

SÜDPACK is a leading manufacturer of high-performance films and packaging solutions for the food, non-food and medical goods industries and also of customer-specific compounds for technically demanding applications.

The family business, which was founded by Alfred Remmele in 1964, is headquartered in Ochsenhausen. The production sites in Germany, France, Poland, India, Switzerland, the Netherlands and the USA are equipped with cutting-edge plant technology and manufacture to the highest standards, including the capacity to operate under clean room conditions. The global sales and service network ensures a high degree of proximity to the customer and comprehensive application technology support in more than 70 countries.

Dr. Nasim Amiralian, Group Leader of the Bio-Inspired Materials Group at the University of Queensland

Bio-packaging from agricultural waste

Amid escalating challenges on how to reduce global plastic pollution, a bio-packaging technology derived from agricultural waste is poised to revolutionise the industry by providing a sustainable, compostable, and recyclable alternative to conventional plastic.

This world-leading technology has been developed in Queensland by Dr. Nasim Amiralian, Group Leader of the Bio-Inspired Materials Group at the University of Queensland and her team.

“We are tackling the dual crises of plastic packaging waste and agricultural food waste, which collectively amount to 1.4 billion tonnes annually," Dr Amiralian said.

“We have created materials from sugarcane trash that can replace plastic packaging and extend the shelf life of produce thanks to its antimicrobial properties. These packaging solutions are optimised for mechanical strength, heat, and moisture resistance, ensuring prolonged shelf life for packaged foods.

Their innovative approach focuses on developing bio-packaging from agricultural waste, that is both compostable and recyclable and can be used to replace conventional items such as berry punnets commonly found in supermarkets.

“Key benefits of this technology include substantial reductions in waste and emissions, elimination of harmful chemicals through recyclable green solvents, enhanced biodegradability, and prevention of microplastic generation. These attributes position the packaging materials as ideal solutions for both earthy and marine environments, aligning with global environmental goals.”

Dr. Amiralian showcased her work as one of seven innovators at the recent AgriFutures Australia and growAG. Catalyst Pitch event in Sydney, NSW, where she detailed this opportunity for investors passionate about sustainability, net-zero, and zero-waste initiatives.

“We’re seeking support from industry partners, corporates, governments, or investors to advance our technology for scaling up in standard production facilities," Dr Amiralian said.

In addition to her groundbreaking work in bio-packaging, Dr. Amiralian is dedicated to advancing opportunities for women and youth in science, technology, engineering and mathematics (STEM). Her recent involvement in The University of Queensland’s Career Progression for Women programme and her role in inspiring youth through the Queensland Chief Scientist case studies highlight her commitment to gender equality and educational advancement in STEM fields.

NZFSSRC: Adding value to the red meat industry

Food safety assurance for our red meat exports adds $millions

Our red meat exports are worth over $10bn, our second biggest earner. The added premium for our products has been achieved by dedicated, continuous research to uphold a gold-standard reputation for food safety. NZFSSRC Associate Director, Dr Gale Brightwell, and her team at AgResearch have spent the last 20 years – since she came to New Zealand in fact – developing a whole suite of technologies, interventions and new knowledge that have incrementally extended the shelf life of high value chilled meats slow-steaming their way to Europe, and reduced the risk of contamination by pathogenic *E. coli* – the Shiga toxin-producing type called STEC, for short.

Gale Brightwell, Principal Scientist, Science Team Leader at AgResearch and Associate Director at NZFSSRC, leads the team focusing on food safety in red meat exports.

The US market was shocked by the "Jack in the Box" *E. coli* outbreak in 1992-3, when contaminated burger meat killed four children and made hundreds very sick – many were left with permanent brain and kidney damage. Their hypervigilance is understandable.

The risk of infection is relatively high in a country which consumes so much ground beef in burgers. When minced for burger or sausage meat, any bacteria on the surface of the meat are mixed inside. Thorough cooking is required to kill any of these bacteria in the centre. Steak tartare and rare burgers should be avoided! In litigation-sensitive US, STEC is regarded as an adulterant and tolerance is now virtually down to zero. That is challenging when calves are unavoidably colonised by *E. coli* (including STEC) at birth and are close together in sheds and during transport. Veal is a higher risk for STEC than adult beef and is mainly sent frozen to the US market for ground beef.

Maintaining market access

To maintain market access to the US, we've put in place a number of controls to stop contaminated meat leaving New Zealand.

Manifold efforts to reduce the bacteria on animals and support regulatory compliance include research on farm to understand its prevalence; developing and validating effective procedures in processing facilities to sanitise carcasses and equipment; and making sure that product testing protocols can reliably pick up any contamination before it is exported. The livelihoods of so many New Zealanders, and the economy overall, absolutely depend on the work of our scientists.

Recognising the value

Recently, Gale wrote a detailed chronological account of their research and consequent interventions over the years, and added up their value to the industry and, by extension, the New Zealand economy. She identified $41.7m of benefits per annum for an average expenditure on research, by industry and/or government, of $8.1m p/a. Two significant beneficiaries of their work are exporters to the US beef market (especially bobby calf exporters) and exporters of chilled lamb to the EU.

Here is an excerpt from 2020 that shows the range, inventiveness and practical nature of her team's work:

"It was shown that STEC can be transmitted via aerosols, particularly during hide removal. Additionally, it was determined that STEC can survive but not grow under chilled vacuum-pack conditions. Furthermore, a study funded by MPI showed that sample freezing did not affect the recovery of STEC during sample testing, allowing for increased production by extending the sampling to testing period, meaning that meat processors can process over the weekend when the testing labs were closed. From 2020 to 2021, blue light technology was explored for disinfecting meat and meat processing surfaces. This work 'socialised' the benefits of light disinfection technology within a meat plant which is now reflected in the interest in uptake of UV technologies."

That year was also the beginning of the pandemic, when processors had the added angst of assuring overseas markets that product and packaging were virus-free and avoiding closure due to staff becoming infected. Gale and many other Centre scientists had to deal with that challenge as well – advising on PPE and scanning the hundreds of international research papers related to the transmission and survivability of COVID-19.

The team working with Gale Brightwell on meat safety: left to right, Amanda Gardner, Tanu Gupta, Delphine Rapp and Rose Collis

EU market requirements

Any treatments used on beef and lamb carcasses for the EU must be chemical-free. If required they can be washed with hot water and lactic acid (a natural organic acid inimical to bacteria). Gale and her team have developed other very clever ways of sanitising not just the meat, but air, water and surfaces in processing facilities, using light in the visible spectrum, blue LED light, and 'far UVC' which kills or disables bacteria whilst being safer to use in the presence of workers than standard UVC. This light treatment and cold plasma (ionised gases) can be used more widely to safely sanitise fruit, vegetables and seeds, which can harbour bacteria like the PSA that devastated our kiwifruit industry. No chemicals are involved and no heat treatment that would degrade the product is used.(see the article on Gale's cold plasma research in the June 2023 issue of FoodNZ).

Training the next generation of scientists

Gale has invested a lot of her time in training and mentoring a group of outstanding young scientists to work in this field, which increasingly requires advanced technological, IT and statistical skills. The next generation are also expected to be much more sophisticated and motivated when it comes to commercialisation – networking with industry and taking their science out of the lab, through 'the valley of death' and making it pay.

Meet Amanda, Delphine, Rose and Tanu – four rising stars in the next generation of science leaders. Their awards and achievements are so numerous that we could only touch on a few.

Amanda Gardner

I was born and raised in Rotorua before moving to the Manawatu to study at Massey University where I earned a Master's degree in Biochemistry. I then joined AgResearch as a Research Associate where under the mentorship of Gale Brightwell and other senior scientists, I developed strong skills in microbiology, molecular biology, and genomics. I had a change in career when I moved to Auckland, spending 6 years in the Beer and Beverage Industry in various Team leader roles which gave me a great perspective of the manufacturing industry while developing leadership skills. I returned to research and after a solid four-year tenure, I was promoted to 'Scientist'.

My research has focused on the use of Far-UVC and Blue LED light for disinfection, leading to exciting applications. I had the opportunity to collaborate on and lead technical experiments for numerous SSIF programmes, including Food Integrity, Microbial Ecology and Shelf Life, Food Omics, Blue LEDs, and Calf Rearing Practices.

I was given fantastic opportunities to present my work at the International Conference for Far-UVC science and Technology in New York in 2023 and St Andrews, Scotland in 2024. And through the SSIF programmes I have cultivated a network of stakeholders in the meat and dairy industries, as well as light technology firms.

The KiwiNet Emerging Innovator award has helped transition my research into industry applications, enhancing my skills in networking, proposal writing, and market validation. This recognition has increased my confidence and leadership abilities, setting a strong foundation for future achievements.

Delphine Rapp

I grew up in a small village in the northeast of France and did my PhD research on bovine spongiform encephalopathy (BSE or 'mad cow disease') at the University of Lyon. Contributing to a wider European research programme, I studied the role of soil microorganisms in degrading the prion that causes BSE.

I started at AgResearch's Ruakura campus in 2007, as a postdoctoral researcher looking at on-farm reservoirs and transmission of *Campylobacter* and their effects on water quality. After joining the Food Integrity team and moving to the Hopkirk Research Institute, I embarked on a transformative leadership journey supported by NZBIDA (New Zealand Bioeconomy In a Digital Age) and SSIF Food Integrity, working with a diverse group of meat industry stakeholders to develop a digital analytic platform. This platform integrates and analyses the complex information generated along the food supply chain, positioning the New Zealand meat industry to respond effectively to future food safety risks.

Over the years, guided discussions and collaborative efforts with stakeholders of the beef and dairy industries have made significant strides in developing a common understanding of integrating food-safety relevant data. I have learned invaluable lessons along this journey, particularly in understanding the intricacies and challenges of data integration across diverse aspects of the supply chain. This has enabled me to hone my ability to facilitate discussions and guide stakeholders towards consensus, ensuring that all stakeholder voices and needs are heard.

Rose Collis

I grew up on a dairy farm in the Tararua District and have always had a passion for science. I've been exceptionally lucky to be supported in my studies, through AgResearch, the NZFSSRC and Massey University, which helped develop my skills in microbial genomics, antimicrobial resistance, metagenomics and bioinformatics.

After I gained my PhD in Veterinary Science at Massey University, I began a post-doctoral position with AgResearch and led the development of Nanopore long-read sequencing and bioinformatic analysis for the SSIF 'Food Integrity Kaupapa Health' project, enhancing microbial water quality assessments and pathogen detection.

I have also been encouraged to present my research to a wide range of audiences including the Primary Production Select Committee at Parliament and the Annual Microbiology Society 2024 Conference in Edinburgh, Scotland, where I presented my first international oral presentation. It was a great opportunity and expanded my international networks for future collaborations.

Throughout my research career, I have had the opportunity to work with and encourage our tamariki and rangatahi to engage with science, an area I really am passionate about. I was recently awarded a prestigious Kia Niwha Leader Fellowship from Te Niwha, and the leadership and technical skills, along with the collaborations that have been developed while being mentored in the Food System Integrity Team will greatly support me in this next chapter of my research journey.

Tanu Gupta

I moved to New Zealand in 2010 from India, having completed my PhD in medical microbiology at the University of Delhi, studying antimicrobial resistance in hospital pathogens. My husband was doing his PhD at AgResearch in Hamilton and being at a loose end when I first arrived, I started volunteering at AgResearch, creating knock-out mutants and producing proteins using recombinant technology. That foot in the door led to a postdoctoral position in Gale's team. With her invaluable support and guidance, I transitioned to a scientist role, focusing on on-farm factors affecting milk safety and strategies to mitigate STEC contamination on meat carcasses.

Over the past seven years, my research has focused on novel peptides and metabolites with antimicrobial properties and my dedication to this field earned me the Basil Jarvis Award for Food Safety and Security in 2022 (one in a whole series of awards Tanu has received). This gave me money for research and travel, and I went to London to receive the award at the Science Museum, "The best trip of my life!"

Recently, I was the only scientist selected from New Zealand, as a finalist in the AgriFutures Grow Australia Women competition, to go over there and pitch my science ideas to investors.

When Gale's team moved to Palmerston North, my partner and I went too. I love the city and its people, and so do my parents when they come to stay for part of the year. The peace and quiet and lack of pollution suit us very well. I feel liberated and accepted by the farmers and others I deal with. I have always hoped that my work will speak for me.

NZIFST NEWS

Welcome, nau mai, haere mai

I am pleased to share that we have started planning for next year's 2025 Annual NZIFST Conference, "Embracing Tradition, Transforming the Future", which will be held in Palmerston North, 24th - 26th June next year.

An enthusiastic group of NZIFST members have either volunteered or been tapped on the shoulder to help organise the conference and the ideas have started flowing in. At this stage we are brainstorming ideas for our different sessions before we put out a call for Abstracts later in the year.

Don Otter is Chair of the Committee for our 60th Anniversary Conference

In 2025 NZIFST will be celebrating its 60th birthday and this will be reflected in a number of the sessions at our conference. It is also rather serendipitous that I was also the conference chair in 2015 for the 50th celebrations in PN, will I still be here for our 75th?

We will be using the conference as an opportunity to recognise a number of our 'early adopters'. I was amazed by the dedication over the years of some of our founding members, to both nurturing the Institute and getting our message out to the public at large.

Leading on from the successful 2024 conference we will also be further highlighting some of the new challenges to the New Zealand food industry including the utilisation of AI and possible changes to our GE regulations. It is important that we as New Zealand's leading food scientists and technologists are cognisant of all these changes when developing new food products, interacting with our customers and consumers, and the regulatory bodies.

We would like to develop a programme that challenges you all to think about what we have achieved over the last 60 years, what is going to happen in the next 60 years, and how we, as New Zealand's food experts, can lead and advise in the food space.

We welcome any input from our members with ideas for sessions, plenary speakers and social events.

Don Otter, FNZIFST , Conference Chairman

NZIFST Directory

EXECUTIVE MANAGER	Wendy Bayliss PO Box 44322, Pt Chevalier Auckland 1022 New Zealand Phone: 022 549 8483, Email: wendy@nzifst.org.nz
PRESIDENT	Esraa El Shall esraaelshall@gmail.com
VICE PRESIDENT	Bob Olayo bob@matt.nz
TREASURER	Grant Boston grant@boston.net.nz

THE NEW ZEALAND INSTITUTE OF FOOD SCIENCE & TECHNOLOGY INC

Branch Reports

Presenters at the Consultants FED talk, left to right, Sam Borgfeldt, Shane Hopgood, Cathy McArdle, David Clark and Anny Dentener, Marie Grandjonc is not present

Auckland

Auckland Branch FED Talk – Is Consulting for you?

(Anny Dentener's key points will be published in the next issue of FNZ)

Anny Dentener hosted and presented at an enlightening FED Talk at Callaghan Innovation, Parnell featuring Cathy McCardle, David Clarke, Marie Grandjonc, Shane Hopgood and Sam Borgfeldt. The event was timed to coincide with the launch of the new NZIFST Food Consultants Directory: https://nzifst.org.nz/Food-Industry-Consultants-Page

Our speakers came from a wide range of disciplines across the consulting space from new product development, labelling and NIPs through to processing advice, food safety auditing and HACCP risk management.

All of the speakers were generous with sharing their successes, failures, do's, don'ts and accumulated wisdom with the audience. Don't forget to save to pay your tax!

There was a lot of networking and reminiscing before and after the event and going by the enthusiasm and number of questions asked, a lot of our fraternity harbour not-so-secret ambitions of becoming consultants in future.

Many thanks once again to all of our speakers for sharing their time and advice, and especially Anny for helping to put this event together.

Please check out the website link above if you require a consultant!

Clinton Meharry, Auckland Branch Chair

Student Careers Evening

On Tuesday 30th July, the Auckland branch held its annual 'Student Careers Evening' at the University of Auckland. We had speakers from different areas of the food and beverage industry to showcase and highlight the different career paths a Degree in Food Science can lead to. This included areas such as product development, packaging, quality, supply chain, business development, operations and further study into a PhD.

We had a fantastic panel of speakers (including 2 of our own Auckland Branch Committee members) who talked about their career journeys since graduating University. Their presentations highlighted what a day in their life looks like through a series of photos and also shared with students' useful advice. It was great to see a common theme of how important networking is and not to be afraid to put yourself out there to gain opportunities and experience. Our immediate past Chair Jess Chong facilitated the Q&A panel session at the end with a mixture of students asking questions or submitting them through

an online portal, Slido. We had a great turnout with 48 students across AUT and University of Auckland and they enjoyed interacting not only with the speakers but also the committee members who were there during the mix and mingling session at the end.

A big thank you to the following speakers who volunteered their time to speak;

- Apiksha Kant – Quality Lead, Fresh Beverages at Fonterra Oceania
- Christine Jian – Applications Technologist at Hawkins Watts
- Gabrielle Lobo – Client Solutions Coordinator at The Foodbowl
- Manasweeta Angane – Microbiologist at Plant & Food Research
- Ryoma Fuse – Packaging Technologist at Suntory Oceania

And finally, this event could not have come together without the hard work of our student sub-committee and product donations from Suntory Oceania and Griffins!

Rebecca Fok - Auckland Branch Secretary

Speakers at the Auckland Careers Evening, left to right, Apiksha Kant, Christine Jian, Gabi Lobo, Manasweeta Angane and Ryoma Fuse

New Members

NZIFST welcomes the following new Standard Members and new Student and Graduate Members

New Standard Members

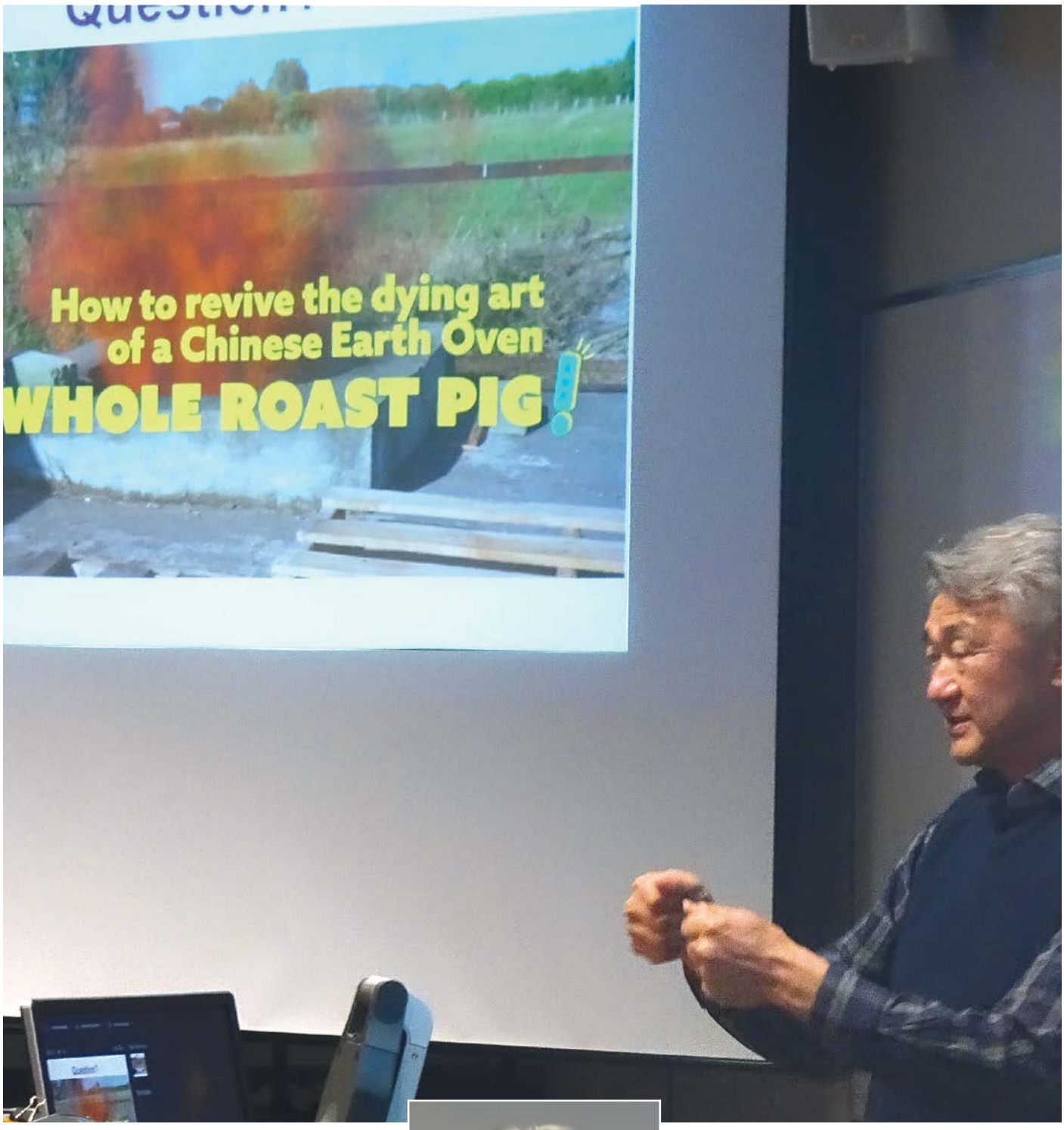
Adarsh Abraham	Quality Assurance Technician	Hellers NZ
Donnell Alexander	Health and Regulatory Manager	New Zealand Food and Grocery Council
Lily Benton	Lead Technologist	Fonterra
Lundi Chhun	Business Development Manager	Hawkins Watts
Nicole Estefani Jerez Espinoza	Food Technologist	Plant & Food Research
Rafea Naffa	CSO	Keraplast
Yadnyavalkya Patil	Food Compliance Officer	NZFS
Ruth Porter	Quality Manager	Hellers
Renn Thompson	Business Development Manager	Hawkins Watts New Zealand
Shaoyang Wang	Lecturer in Food & Sensory Science	Lincoln University
Grant Washington-Smith	Chief Scientist	Carefore Global NZ Ltd
Hayden Pohio	Business Development Manager – Food & Beverage	Freemen Nutra

New Graduate Members

Remy Rose Bagares	Technical Writer	Synlait Milk Limited
Anna Harrison	Graduate Food Technologist	Real Foods Ltd
Alyssa Mitchell	Quality Assurance Technician	Hellers
Trishika Nand	Optical Assistant	Specsavers
Amy Pilkinton	Applications Technologist	Hawkins Watts
Georgia Thompson	Quality Administrator	Hawkins Watts

New Student Members

AUT: Rifqah Azzahra Naulidia, Jissa Sunny **Lincoln University:** Brooke McNamara, Gaosheng Wu, **Massey University:** Dinh Huy Bui, Olivia Powell, Arlo Rea, Sujirtha Vishnukumar **University of Auckland:** Xuan Dong, Dahye Jeong, Charis Prins, Yuan Wen, Caiyan Ye **University of Otago:** Millie Hansen, Stephanie McLeod, **WINTEC**, Kaleb Nordstrom



Central

"History never repeats, until it does". Rodney Wong.

Rodney Wong is a long-standing and active member of our branch whose food industry involvement has mostly been in the rare air level of governance roles at the innovation bleeding edge. In this "off the record" talk Rodney outlined some of the learnings he has absorbed through his time in food industry management and governance. Amongst those experiences were:

- The fusion of two Crown Research Institutes to form the amalgamated Plant&Food Research Institute while Chairman of Crop and Food Research in 2008.
- Formation, development and divesting a technology-led entrepreneurial food ingredient company (Speirs Nutritionals) as Chairman.
- Directing food industry research priorities as a board member of the High Value Nutrition National Science Challenge.

Above: Rodney explains the dying Chinese art of pit-roasting a whole pig

Longstanding branch member Rodney Wong recounted some of his experiences in governance in the NZ Food Industry.

Rodney offered his audience a choice between examples he classified as "the good, the bad and the ugly"; needless to say audience priorities put "bad" and "ugly" before "good"! Rodney related personal highlights, frights and insights from his forty years in food industry governance through anecdotes and cautionary tales. In the course of this presentation Rodney presented gems like "look big, act small", "workers always know what is wrong and how to fix it … if resourced", and the titular insight "history never repeats … until it does".

After his core talk Rodney surprised us with an unexpected second course, a YouTube video of him roasting a 65kg whole pig in a traditional Chinese earth oven. This traditional means of cooking roast pork is a dying part of immigrant Chinese culture and Rodney and daughter Jess prepared the video to help preserve the art. Whereas there used to be a dozen Chinese pig ovens in the Manawatu there is now just one remaining. The process involves preparing a brick-lined hole in the ground, heating the bricks through direct fire then suspending a prepared whole pig in the pit using the residual heat to cook the pig to its crackling best. You can see this by searching "dying art of the Chinese earth oven" in the YouTube search screen.

In addition to his food industry contributions, Rodney notably also invests energy in local community and service projects. Beyond engagement with the local Chinese community as indicated by his pig-roasting video, Rodney led the initiative to develop the publicly-accessible Wildbase veterinary care facility in the Palmerston North Esplanade public gardens. Through this facility locals and visitors can check-in on recovering native fauna being cared for in a sympathetic setting by Massey University veterinary personnel. Just one more aspect of Rodney's contribution to our local Manawatu community that led to him being awarded the Palmerston North Civic Award in 2019.

August FED talk: Sarah Golding

Social media for food scientists

On a miserably cold mid-winter evening in August, Central Branch hosted a FED talk in which Sarah Golding, Massey University College of Sciences Communications and Engagement Advisor, briefed us on how food scientists can be more effective with social media. The weather deterred many from leaving home so in-person attendance was disappointing, but on-line attendance compensated.

Sarah told us that social media emerged in 1979 with an on-line chat room "Talkomatic" and evolved through an increasingly sophisticated sequence of chat platforms, messenger services and smart-phone apps until the modern goliath Tik Tok was spawned in 2016, and Twitter morphed to "X" last year. LinkedIn arriving in 2003 was a key development in business social media. Social media's distinguishing attribute is that it provides two-way communication channels within and between communities, enabling remote collaboration. Social media is unhindered by geographic separation: it being as easy to engage with someone on the other side of the world as your neighbour. So, as Sarah quoted, "We don't have a choice whether we do social media; it's just a matter of how well we do it".

Sarah shared data showing average year-on-year internet use in New Zealand had increased by 4.3% (or 15mins a day) but surprisingly most media use (physical and electronic) had declined, including social media (12% reduction or 16 mins less each day). Over three quarters of New Zealand's population (78.7%) admit to being social media users with a slight skew to female users across all platforms.

The value of social media for research scientists is real as it provides a responsive means to disseminate your information, to link with others (for collaboration or employment opportunities) and contribute to academic performance scoring. Effective use requires providing the right message to the right audience at the right time, so picking the channel that links you with your "like-minded community" is crucial. Each platform has distinct styles and demographics: Instagram generally hosts younger people whereas Facebook is predominantly populated by older age groups. Aligning the medium with the target audience is a key aspect of effective social media strategy.

LinkedIn is the appropriate social media choice for professional engagement since its focus aligns best with business and career aspects. About one in two Kiwis use LinkedIn. The gender skew is reversed on this platform with a slightly greater proportion of male participants. Globally, LinkedIn also shows a higher presence of graduate participants with only 2% having secondary education as their highest qualification, a further factor that aligns with professionals. LinkedIn also provides opportunities to dice and slice your reach into a diverse range of peer groups and to "sell" yourself to a global professional audience.

Sarah spent the final section of her talk advising how users can best frame content to be noticed on LinkedIn distinguishing how social media posts differ from traditional scientific publications.

The world of social media is evidently its own communications world. It provides nuanced elements of conversation, print and broadcast performed in an echo chamber. Powerful when done well, it can be as precarious as a slippery slope if done ineptly. Sarah provided interesting insights to how to give yourself the best opportunity to excel should your professional ambitions need the boost of a social media personality presence. For the rest of us social media provides an interesting lens through which to observe the world.

Allan Main FNZIFST

Canterbury – Westland

Networking Event with Lincoln University – 10th Sept 2024

A networking evening on 10th Sept was a collaboration with Lincoln University and an opportunity for students to meet industry professionals and receive mentoring about their future careers.

With around 70 attendees, the evening kicked off with two LU lecturers giving short presentations on their specialist subjects:

- Wine Food & Molecular Biosciences lecturer, Chrystal O'Connor, spoke about her research into New Zealand's edible insects and how they could be introduced into the market.
- Food & Sensory Science lecturer Dr Shaoyang Wang spoke about the role of food sensory science in the industry.

Mentors then briefly introduced themselves so that students could select whom to talk to according to their areas of interest. There was no shortage of students with questions, and the demand resulted in the event carrying on for an hour past its scheduled finish time.

One student said the conversations with mentors gave him an advantage heading into his career, as now he knew what employers

Branch Members at the Opal Fibre packaging tour

A fully engaged audience at the Lincoln University Networking Event

were looking for and the challenges they might face in the future. "The night really opened my eyes for what to prepare for going into the industry and that a lot of hard work is required to be successful."

Agriculture and Life Sciences lecturer and NZIFST C-W Committee member, Hannah Lee, said it was valuable experience for students who may never have been able to meet industry professionals in senior positions otherwise.

A successful event that we will certainly be repeating.

Margot Richards

OPAL Fibre Packaging Plant Tour

On 30th July, Opal hosted 8 members of the Canterbury-Westland branch for a tour of their plant at Branston Street, Hornby, Christchurch.

Some key facts and figures we learnt:

- The plant was originally owned by Amcor, who sold it to Orora, who sold it to Nippon Paper Group. Opal Packaging is a subsidiary of Nippon, operating in Australia and New Zealand.
- There is one large, corrugated board forming line which takes in large (1T +) rolls of card and produces corrugated board at an impressive speeds of a few 100 metres per minute.
- From there the board is used to make a variety of cardboard box styles for mainly meat, FMCG, and horticulture clients.
- Printing is done as the boxes are formed automatically on three main box forming lines, and can do up to 4 colour spot printing.
- Cartons are designed on site to each specific customer's needs.
- Several hundred pallets of finished cartons (flat) leave site every day.

Thanks to Kylee Stack for taking the time to conduct this plant tour and educating us on the manufacturing process for corrugated board cartons. NZIFST members really appreciate these on-site visits and learning about suppliers to the food industry.

Rex Johnstone and Margot Richards

At the Kilmarnock Enterprises presentation: Rex Johnstone (Branch Chair), Michael Toothill (Kilmarnock Enterprises) and Charlotte Sullivan (Branch Secretary)

Kilmarnock Enterprises

Michael Toothill, CEO of Kilmarnock Enterprises which provides employment for people with intellectual disability, talked to the Canterbury-Westland branch members on 21st August. Michael is clearly passionate about his work and previously served as the General Manager of the Kilmarnock Trust.

After summarising the history of this enterprise, from its establishment in 1958, Michael shared the types of work that Kilmarnock currently undertakes. Around 70 staff carry out a variety of contract tasks including:

Herb and Spice packing, Labelling of Food Service bags prior to filling, Metal detection services for food products, E-waste Recycling – deconstruction of old electronic equipment to recover the various valuable components.

In 2017, Kilmarnock moved into purpose-built premises in Wigram. This location has given them significantly more space including areas designed specifically for food processing activities. The operation has ISO9001 Accreditation.

In 2020 the Will & Able range of cleaning products was launched. This range of eco-friendly, non-animal tested, vegan products is filled, packed and dispatched by Kilmarnock staff at Wigram.

A key aspect of Kilmarnock's philosophy is creating meaningful jobs for people with disability, and to that end, they provide training to equip staff with skills and confidence for a range of tasks, both within Kilmarnock and for external employment.

We really enjoyed hearing Michael's talk about this inspiring enterprise providing a great service to both its employees and customers.

Margot Richards

Otago – Southland

Student Careers Evening

The NZIFST Otago Southland Branch has had an exciting past month with events that focused on the budding food scientists and technologists in the region.

Early in August, the NZIFST Otago Southland branch hosted an inspiring and informative student careers evening. With support from the Department of Food Science, the University of Otago Careers Hub, and willing student helpers, the event featured three guest speakers from diverse areas of the food industry.

- Paulette Elliot from KPMG Propagate shared her career journey from hands-on development technologist to a managerial role supporting agri-food innovation.
- Georgia Mayer gave us thoughtful insights into her experience as leader of cooking product performance at Fisher and Paykel Appliances, along with her team that includes several University of Otago Food Science graduates.
- Jamie Scrimgeour shared some practical advice for getting a foot in the brewery door, and his progression from cellar hand to lab technician, to food safety and environmental coordinator at Emerson's Brewery.

The evening finished with refreshments prepared by the Food and Agriculture Students Association, and informal networking, creating an opportunity for students to speak with Jamie, Georgia, and the attending academic staff. Thank you to the speakers for kindly providing their time and experience and to everyone for another successful and inspiring careers evening. These events truly illustrate the plethora of exciting opportunities for graduates in the food industry.

Science Fair judging

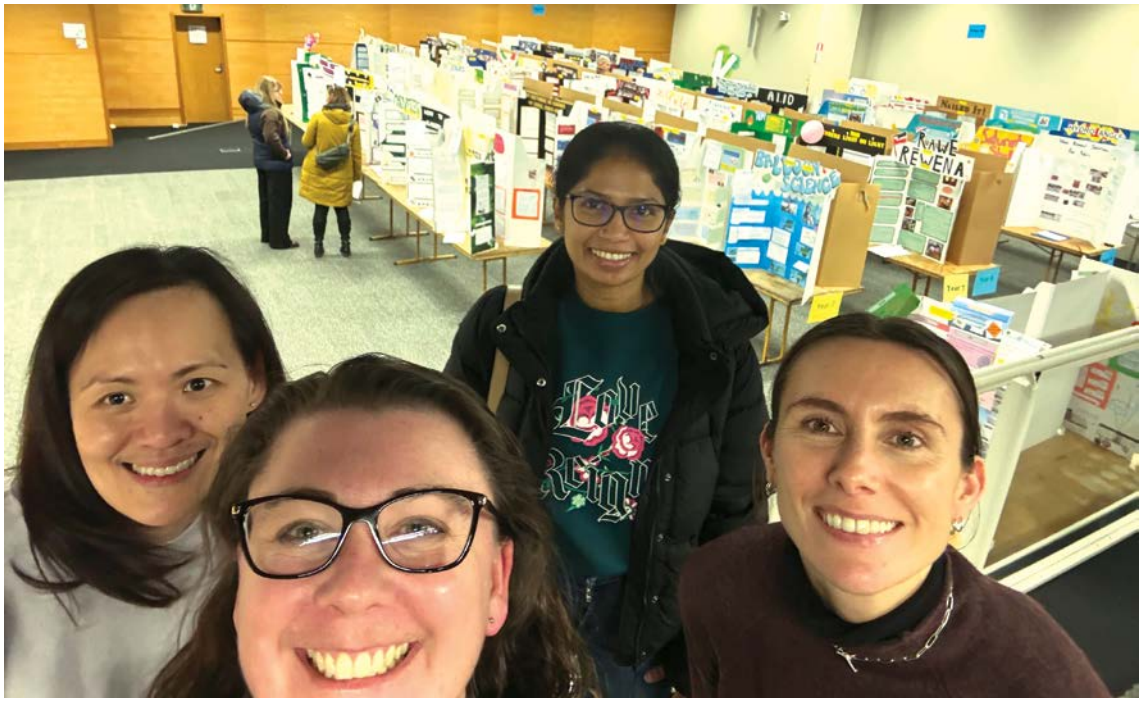
The second event on the calendar was judging for the Aurora Energy Otago Science and Technology Fair which ran from the 12th to the 13th of August 2024. Five judges representing NZIFST reviewed the 21 entries across the two days that met the food science inclusion criteria and made a shortlist of the top six entries. All the entries showed a lot of enthusiasm and great work, and the six best were determined to be prize winners, covering the full range of ages from Year 7 to Year 13. The winner of the $250 Seperex Nutritionals-sponsored prize was awarded to a Year 13 project called "Keen for Green", where the students investigated producing and using bioplastic alternatives, that can be made in the home, as a sustainable alternative to traditional plastic-based food packaging materials. The runner-up prizes were all $30 each and included the following projects:

- A year 7 project on how to treat a shaken can of soda to minimise product loss when opening "Shaken, not Stirred",
- a year 7 project on egg replacement options in biscuits and cupcakes "No Eggs, No Worries",
- a year 8 sensory study into which foods are preferred by dogs: "Dogs Food",
- a year 8 project evaluating the differences between different coloured capsicum "Rainbow Peppers", and
- a year 8 sensory study into spice tolerance "Spice up your Life!"

We also wanted to give special mention to the "Shaken, not Stirred" project, where they acknowledged and thanked their dad for drinking all the leftover Sprite generated by their project.

For the Southland Science and Technology Fair there were four winners chosen to receive an NZIFST award, each student took away a $100 prize as the top entrants were deemed too close to separate:

Jamie Scrimgeour from Emerson's Brewery presenting his career journey



Aurora Energy Otago Science and Technology Fair Judges, left to right Stephanie Then, Erin Young, Sakuni De Silva, Stephanie McMcLeod

- Yuck! Brown Apples – Louis Boekhout (Woodlands Primary)
- Does Smell Affect Taste? – Hannah Roberts (Drummond Primary School)
- What Makes A Good Heat-up – Niamh Fortune-Harris
- Avocado – Vivian Rout (Waihopai School)

Brigitte Klimek

Waikato

Waikato Niwa Science and Technology Fair

The Waikato Niwa Science and Technology Fair was held at the Distinction Hotel Conference Centre, on the 19th of August. The NZIFST donated special prizes for the best food related entries in the Junior and Senior sections. David Platts and Katharine Adam attended as judges for the awards. The topics covered by the food related entries included the chemistry of baking, consumer perception, and food production. The students selected to receive the awards were enthusiastic and demonstrated excellent understanding of scientific process. The Junior prize went to Finlay Opie for his entry, "Healthy Muffins? Do they taste the same?", and the senior prize went to Aliyah Alchin for her entry, "Let it Grow".

Katharine Adam

Upcoming Events

The Waikato branch will host a FED Talk in October titled "Foreign Objects in Food: The Importance of a Definitive Identification," presented by Rob Archibald. Join us in person or online to gain valuable insights into foreign object detection from industry expert Rob, whose extensive food science and engineering career offers unique perspectives on addressing complex contamination challenges.

Marcus Loi

Fancy a Huhu Grub? In New Zealand, historically, Huhu grubs were the most commonly consumed insect

Entomotherapy – A Novel Approach to Combatting Disease

Marco Davis, Student, Department of Food Science, University of Otago

This article was awarded first prize in the Food Tech Solutions NZIFST Undergraduate Writing Competition 2024. The annual competition is open to undergraduate food science and food technology students who are invited to write on any technical subject or latest development in the food science and technology field that may be important to the consumer.

The consumption of insects as a nutrient source, known as entomophagy, has been practiced for millennia across Africa, Asia, Latin America and Oceania (Zhou et al., 2022). In New Zealand, historically, Huhu grubs were the most commonly consumed insect (O'Connor et al., 2023). Approximately 2100 species of edible insects exist, with consumption occurring at all insect life stages, from eggs to mature adults (Krongdang et al., 2023).

Entomophagy became commonplace due to the rich nutritive value of insects. They contain high levels of protein, fat, and vitamins (Zhou et al., 2022). Insects also have smaller ecological impacts compared to traditional livestock, with fewer land and water requirements, and greenhouse gas emissions (Chantawannakul, 2020). Unsurprisingly, insect sustainability and nutrition has attracted much attention to the practice and its potential as a novel food source (Zhou et al., 2022). However, the therapeutic potential of edible insects, known as entomotherapy, remains relatively unexplored.

What is Entomotherapy?

Entomotherapy focuses on bioactive compounds found in edible insects, and their functional benefits, including being used as cures for ailments and disease (Chantawannakul, 2020). Entomotherapy is not a novel concept, with the practice being utilised for millennia. In China, around 300 different insects were used to create approximately 1700 traditional medicines (Feng et al., 2009). While in New Zealand, entomotherapy plays a traditional role in Māori rongoā or medicine, including the use of snail slime for wheezing lungs (O'Connor et al., 2023).

Bioactive Compounds and Functionalities

Edible insects used in entomotherapy possess various bioactive compounds, including polyphenols, active polysaccharides, peptides, sterols, chitin, and chitosan (Chantawannakul, 2020; Qian et al., 2022). Specific functionalities depend on compound structure, but effects include tumour suppression, blood sugar and lipid regulation,

antioxidant activity, immune system modulation, and antimicrobial activities (Zhou et al., 2022). Although a single bioactive compound can possess several functionalities, there are numerous compounds which exhibit similar pharmacological effects (Qian et al., 2022) For example, the pygidial gland secretion from the forest caterpillar hunter (*Calosoma sycophanta*), and chitin/chitosan extracts from the domestic silk moth (*Bombyx mori*) both exhibit strong antibacterial activity against the common pathogen *Escherichia coli*.Additionally, the gland secretion possesses stronger antifungal effects, and the extract exhibits stronger anti-bacterial potential, than certain currently available medications (Battampara et al., 2020; Nenadić et al., 2017). These show the potential of insect-derived bioactive compounds as effective medicines, with the potential to have similar or better treatment prospects than currently-existing therapeutic interventions. Two important activities of insect-derived bioactive compounds include their anticancer and antioxidant potential

Anticancer potential

The ability to inhibit cancerous tumours is greatly important. Current treatments, including chemotherapy and radiotherapy, possess toxic effects and cannot selectively target cancer cells, ultimately destroying healthy human cells (Sinha & Choudhury, 2024). In the search for novel cancer treatments, entomotherapy is one solution, with numerous insect-derived compounds, including peptides, proteins, and chitosan, possessing anti-cancer potential, through selective tumour inhibition and enhanced immunity (Qian et al., 2022). In vitro and in vivo experiments have shown specific compounds to inhibit different cancers, including breast, lung, skin, colon, and liver (Zhou et al., 2022).

Hui et al. (2002) also demonstrated the potential for combination therapies and showed that combining the bioactive cecropin A, isolated from *B. mori*, with specific chemotherapeutic drugs, achieves a greater anticancer effect. Although there is potential for entomotherapy-based treatments, more research into exact anti-cancer mechanisms is required to develop therapies which are safer and more effective than current treatments.

Antioxidant effects

Although oxygen is required for human cellular metabolism, the abundance of it creates reactive oxygen species (ROS), which damage cells in high concentrations. Antioxidants are important in scavenging ROS, reducing oxidative stress, and lowering the risk of diseases, specifically cardiovascular disorders, and cancers (Qian et al., 2022; Zhou et al., 2022).

Several bioactive compounds from edible insects, including chitosan and specific peptides, demonstrate great antioxidant effects. For example, in-vitro studies showed the antioxidants of water-soluble extracts from crickets, grasshoppers and silkworms to be five times greater than fresh orange juice (Zhou et al., 2022). Further showing the potential of entomotherapy to produce novel treatments which are more effective than current medications.

Safety concerns

Before entomotherapy can be deemed an effective alternative to traditional treatments, several safety concerns must be addressed. Insect allergenicity remains an issue, with over 230 allergens identified from arthropods, predominantly locusts and grasshoppers. Despite allergen sensitivities, the sheer potential to exploit edible insects for disease treatments necessitates further research to better prevent undesired reactions (Zhou et al., 2022).

Pesticide residues and heavy metal contamination present additional risks. However, as these variables are primarily a result of the environment which insects feed from, these concerns are more relevant for wild-harvested insects. Both concerns can be mitigated through farming, as greater control can be placed over the environment, and subsequent contaminant exposure (Zhou et al., 2022)

Future potential

Despite the evident potential of entomotherapy as novel treatments for disease, further research is required before they can become a widespread and viable alternative to traditional and orthodox medicines. More research is needed to unravel the identities and properties of bioactive compounds, their therapeutic mechanisms, and the potential risk of allergenicity, to ultimately ensure effective and safe outcomes.

References

Battampara, P., Nimisha Sathish, T., Reddy, R., Guna, V., Nagananda, G. S., Reddy, N., Ramesha, B. S., Maharaddi, V. H., Rao, A. P., Ravikumar, H. N., Biradar, A., & Radhakrishna, P. G. (2020). Properties of chitin and chitosan extracted from silkworm pupae and egg shells. *International Journal of Biological Macromolecules*, 161, 1296-1304. https://doi.org/https://doi.org/10.1016/j.ijbiomac.2020.07.161

Chantawannakul, P. (2020). From entomophagy to entomotherapy. FBL, 25(1), 179-200. https://doi.org/10.2741/4802

Feng, Y., Zhao, M., He, Z., Chen, Z., & Sun, L. (2009). Research and utilization of medicinal insects in China. *Entomological Research*, 39, 313-316. https://doi.org/10.1111/j.1748-5967.2009.00236.x

Hui, L., Leung, K., & Chen, H. M. (2002). The combined effects of antibacterial peptide cecropin A and anti-cancer agents on leukaemia cells.*Anticancer Res*, 22(5), 2811-2816.

Krongdang, S., Phokasem, P., Venkatachalam, K., & Charoenphun, N. (2023). Edible Insects in Thailand: An Overview of Status, Properties, Processing, and Utilization in the Food Industry [Review]. *Foods*, 12(11), Article 2162. https://doi.org/10.3390/foods12112162

Nenadić, M., Soković, M., Glamočlija, J., Ćirić, A., Perić-Mataruga, V., Ilijin, L., Tešević, V., Todosijević, M., Vujisić, L., Vesović, N., & Ćurčić, S. (2017). The pygidial gland secretion of the forest caterpillar hunter, *Calosoma (Calosoma) sycophanta*: the antimicrobial properties against human pathogens. *Applied Microbiology and Biotechnology*, 101(3), 977-985. https://doi.org/10.1007/s00253-016-8082-7

O'Connor, C. T., Gathercole, J., Finlay-Smits, S., McNeill, M. R., Bowie, M., van Koten, C., & Morton, J. D. (2023). Attitudes to consumption of edible insects by indigenous Māori in Aotearoa New Zealand: future commercial opportunities. *Journal of Insects as Food and Feed*, 10(2), 219-235. https://doi.org/https://doi.org/10.1163/23524588-20230105

Qian, L., Deng, P., Chen, F., Cao, Y., Sun, H., & Liao, H. (2022). The exploration and utilization of functional substances in edible insects: a review [Review]. *Food Production, Processing and Nutrition*, 4(1), Article 11. https://doi.org/10.1186/s43014-022-00090-4

Sinha, B., & Choudhury, Y. (2024). Revisiting edible insects as sources of therapeutics and drug delivery systems for cancer therapy. *Front Pharmacol*, 15, 1345281. https://doi.org/10.3389/fphar.2024.1345281

Zhou, Y., Wang, D., Zhou, S., Duan, H., Guo, J., & Yan, W. (2022). Nutritional Composition, Health Benefits, and Application Value of Edible Insects: A Review [Review]. *Foods*, 11(24), Article 3961. https://doi.org/10.3390/foods11243961

19th NZOZ Sensory Symposium 2025

19 - 21 February 2025 - Palmerston North, New Zealand

Expanding Horizons

Registration

Information

Abstract Submission

The New Zealand Institute Of Food Science & Technology Inc

australian institute of food science & technology