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OFFICIAL PUBLICATION OF AIFST

## FOOD SCIENCE & EDUCATION

The key to our future

## FOOD SCIENCE & HUMANITARIAN AID

## EDUCATION OUTCOMES IN CHILDREN

Connections with good nutrition



Food Innovation Australia<sup>Ltd</sup>

### Regulars

- Food for Thought*
- AIFST News*
- The Pulse*
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- Fast Five*

# COLLABORATION: ESSENTIAL INGREDIENT FOR SECTOR GROWTH

Global food and agribusiness markets are evolving at an unprecedented rate.<sup>1</sup> These changes are characterised by a rising demand for food, amidst increasingly harsh and unpredictable farming conditions; globalised supply chains embedded within growing geopolitical instability; technological advances disrupting every element of the value chain. Consumers are now demanding convenience, expanded flavours and experiences, customised offerings, provenance and traceability, as well as products that enhance physical and mental wellbeing.

Despite these massive shakeups, the Australian food and agribusiness sector is projected to be a key source of growth for the national economy over the coming decades.<sup>2</sup> The potential is there for the sector to really strengthen its position as a small but significant exporter of sustainable, authentic, healthy, high quality and consistent products. Key to seeing this growth come to fruition is equipping businesses with the agility needed to embrace the changing nature of the market.

CSIRO's Food and Agribusiness Roadmap identified collaboration and knowledge sharing as a key growth enabler. This industry culture is being fostered by not-for-profit, Food Innovation Australia Limited (FIAL). FIAL supports Australian food and agribusinesses to grow their presence and compete in the global marketplace. It sees collaboration between researchers and industry as essential. Without it, businesses will not be able to develop the innovative, cost-effective, and differentiated offerings needed for the sector's sustained growth.



Recently, a new partnership between FIAL and Australian Postgraduate Research (APR) Intern was announced – the Mobility Fund. This initiative will open up new PhD talent, skills and thinking to industry. Funding will be awarded to expand the ability of industry to partner with researchers, regardless of location. This partnership will see food and agribusinesses tapping into new realms of innovation and opportunity, all while solving critical business problems. Key areas of focus for the projects are food security and sustainability, food waste value addition, native foods for wellness, improved food health ratings, novel functional ingredients, enhanced production and value addition, foods for healthy ageing, and foods for the future consumer.

To find out more, visit: <https://aprintern.org.au> and <https://fial.com.au>

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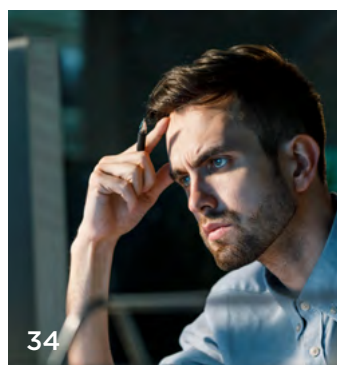
## CONTACT:

Tel. + 61 3 9731 3422

E: [info@fial.com.au](mailto:info@fial.com.au)

[www.fial.com.au](http://www.fial.com.au)





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*Food Science & Education,  
The key to our future.*

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## Editorial Coordination

Bite Communications

## Contributors

Dr Geoffrey Annison, Marc Barnes, Matthew Boyce, Carla Bourgy, Melissa Fitzgerald, Dr Roslyn Giglia, Debbie Hawkes, Dr Russell Keast, Nerida Kelton, Dr Gie Liem, April McElligott, Deon Mahoney, Emily Mantilla, Dr Martin Palmer, Chris Preston, Donna Rosa, Dr Georgie Russell, Nick Williams.

## Advertising Manager

Clive Russell

## Subscriptions

AIFST | aifst@aifst.com.au

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## AIFST National Office

11 Julius Avenue,  
North Ryde, NSW, 2113, Australia  
Tel: +61 447 066 324  
Email: [aifst@aifst.com.au](mailto:aifst@aifst.com.au)  
Web: [www.aifst.asn.au](http://www.aifst.asn.au)



## Food for Thought

Welcome to 2020 - a new year and a new decade.

We have recently finalised the theme for the 2020 AIFST convention: Food science revolution - building a sustainable future. One definition of revolution is 'a complete change in ways of thinking' which is appropriate given the world of food science and technology is changing rapidly to meet the future need for a safe, nutritious and sustainable food supply.

The convention (AIFST20) will be held on 6 and 7 July, so please lock these dates into your calendar.

In this January - March 2020 edition of *food australia*, education and learning are our key themes - both critical if we are to keep up with the food science revolution. Nelson Mandela said education is the most powerful weapon you can use to change the world - and the world of food needs to change, to revolutionise.

In this issue we explore a number of education related topics - food and nutrition education in Queensland schools, the connection between nutrition and education outcomes for children, educating the future food scientist and technologist, and food technology as a career. We also have contributions from student authors on the AIFST mentoring program and food science education.

Other topics of interest include humanitarian food science and technology and its role in enhancing food security, health and economic prosperity, plus an update on allergen management resources and a roundup on food research projects.

Education will continue to be a major focus for AIFST in 2020 under our key pillars of grow, learn, connect and champion.

Our first event for the year will be the NZOZ Sensory and Consumer Science Symposium in Melbourne. This is closely followed by the AIFST summer school for undergraduate and post graduate students, this year hosted by RMIT University in Melbourne.

The AIFST annual awards are designed to recognise the commitment and contribution of AIFST members to the Institute and the industry. Applications for 2020 are now open and I encourage all members to consider entering or nominating a colleague.

As always, I invite and encourage all members to take an active role engaging with the Institute. Talk to us in 2020.

## Fiona Fleming

B. App Sc (Food Tech); MNutr Mgt;  
FAIFST; MAICD  
Managing Director  
[fiona.fleming@aifst.com.au](mailto:fiona.fleming@aifst.com.au)



# How many Australians experience food insecurity?

The Foodbank Hunger Report, now in its seventh year, surveyed 2000 charities and 1000 individuals from around Australia who are experiencing food insecurity.

The October 2019 report found that in the past year, more than one in five Australians have been in a situation where they have run out of food and were unable to buy more - the equivalent of five million people. At least once a week, around half of these people skip a meal or cut down on the size of their meals to make their food go further. At least once a week, three in ten food insecure Australians go a whole day without eating.

The top three immediate causes of food insecurity are an unexpected bill or expense, living on a low income or pension, and meeting rent or mortgage payments. Being unable to afford enough food takes a significant toll on a person's physical health, and food insecurity can also have a devastating effect on an individual's mental health.

In spite of Foodbank now providing food relief for more than 810,000 people every month, the Foodbank Hunger Report shows the charity network is still not meeting demand. There has been a 22 per cent increase in the number of individuals accessing food relief in the past year and only 37 per cent of charities believe they are meeting the full demand in their communities.

As a result, Foodbank is calling for a commitment to introduce a National Food Security Strategy to ensure we achieve zero hunger in this country by 2030.

More than  
**21% OF AUSTRALIANS**  
have experienced **food insecurity**  
in the past 12 months

**30%**  
of food insecure people  
go a **WHOLE DAY**  
without eating

**WOMEN** are  
**1.5 TIMES**  
**MORE LIKELY** than men  
to have  
experienced **FOOD INSECURITY**  
in the last 12 months

Only **37%**  
of charities are  
**MEETING** the  
**full NEEDS**  
of the people  
they assist

**Children** represent  
**22%**  
of all **food insecure**  
Australians

**FOOD INSECURE** Australians are  
**5 TIMES**  
**MORE LIKELY** to experience  
**PSYCHOLOGICAL DISTRESS**  
than the average Australian

In 2018, an estimated  
**40 MILLION**  
children under five were  
**OVERWEIGHT**

**70%**  
of **FOOD INSECURE** Australians  
experience high or  
very **HIGH LEVELS**  
of psychological **DISTRESS**

**FOODBANK** provides  
**RELIEF** to more than  
**815,000**  
Australians every month

**53%** of Australians  
experiencing **FOOD INSECURITY**  
have sought **ASSISTANCE** from  
a charity at least once in the  
past 12 months

**22% INCREASE** in the  
number of individuals seeking  
**FOOD RELIEF** from charities  
in the last 12 months

# A new technology for food preservation

A new technology that preserves food products at subfreezing temperatures, while preventing the damage caused by ice crystal formation inside the product, could be a game-changer for the frozen food industry.

Isochoric freezing, originally developed by Boris Rubinsky at the University of California, Berkeley, preserves biological materials without the formation of ice crystals. The key to this method is the thermodynamic condition in which freezing occurs. A food product is fully immersed in an isotonic solution inside a closed chamber so the volume remains constant during freezing.

This freezing technique was examined as a preservation method in the frozen food industry when Mr Rubinsky started a collaboration with the US Department of Agriculture in 2017. The team found that freezing under certain isochoric conditions produced frozen foods that were superior to those preserved with conventional freezing techniques.

In addition, thermodynamic analyses have demonstrated that freezing in an isochoric system can reduce energy consumption by up to 70 per cent compared with a traditional freezing processes.

The global frozen food market - valued at more than \$250 billion in



Roberto Avena-Bustillos (left) and Cristina Bilbao-Sainz demonstrate the use of isochoric freezing chambers. Photo U.S. Department of Agriculture.

2015 - is projected to reach \$282.5 billion by 2023. Many foods, especially those with delicate textures such as fruits and vegetables, are not suitable for traditional freezing methods because they deteriorate significantly during the freezing process.

The potential for isochoric freezing to maintain a food's 'fresh' qualities when stored at subfreezing temperatures has

so far been demonstrated with cherries, tomatoes and potatoes.

Other research into isochoric freezing has found it could also eliminate potentially harmful bacteria which are reduced during storage. This novel technology could therefore also find commercial applications in the sterilisation and preservation of beverages such as milk, tea, and juices.

## Aussies hungry for plant-based

A consumer research report looking at Australian consumers' evolving relationship with meat has found that Australians are increasingly hungry for plant-based meat options.

The research, commissioned by Food Frontier, Australia and New Zealand's independent think tank and industry advisor for plant-based and cultivated meat, and conducted by Colmar Brunton, found millions of Australians and Kiwis are reducing their meat intake.

Interest in plant-based alternatives is gaining considerable momentum with millions of Australians eating less

meat. One in three are consciously limiting their meat consumption and an additional 10 per cent are entirely meat-free.

The report also found interest in eating less meat has grown in just the last year. The number of Australians defined as 'flexitarian' has grown by 20 per cent and 20 per cent of meat eaters have reduced their meat consumption.

Baby boomers are leading the meat-reduction trend, whereas vegetarians and vegans are most likely to be millennials. Consistently, all generations nominated health, the environment and animal welfare as the most important reasons to reduce meat consumption.

Find the full report at [foodfrontier.org/reports/](http://foodfrontier.org/reports/)



## Aussie shoppers don't like wasting ugly fruit



Data from SAI Global has revealed 50 per cent of Australian consumers dislike the overuse of plastic packaging and discard imperfect produce across the country's supermarkets.

Around 53 per cent of survey respondents felt supermarkets used too much plastic packaging, although younger respondents appreciate its convenience. As many as 63 per cent of older respondents (aged over 65) wanted less prolific plastic packaging across all supermarkets, compared to 58 per cent of 55 to 64 year olds, 52 per cent of 35 to 54 year olds, 49 per cent of 25 to 34 year olds and 39 per

cent of 18 to 24 year olds.

The survey found 39 per cent of Australian consumers also wanted supermarkets to accept imperfect produce, with 43 per cent of 18 to 34 year olds supporting the inclusion of imperfect produce in supermarkets.

Andrew Nash, food safety expert at SAI Global, said they agree any overuse of plastics is unfortunate.

"Plastic should be reduced where possible. However, unbeknownst to many shoppers, supermarkets use plastic for food safety purposes," Mr Nash said.

"Plastic is effective in protecting high-risk foods, such as meat and

dairy, from contamination through the millions of pathogens and microorganisms in the environment. Plastic, particularly if shrink-wrapped, also helps prevent food from oxidising and spoiling quickly, and it is a good protectant from chemicals in the atmosphere," he said.

Coles will begin selling 'ugly' fruit and vegetables in the war against waste, with trials commencing in Victoria and South Australia. Woolworths has had a similar campaign, called 'odd bunch', running since 2014 which sells 'ugly' produce at reduced prices to combat excessive food wastage.

## Young consumers for food technology

A study by global communications consultancy Ketchum found generation Z and millennials are the most open to new food technologies. The good news for processors and manufacturers is that these younger consumers are also the most prone to want to talk about their food experiences. The key to success, therefore, lies in communication.

Ketchum's managing director of food, agriculture and ingredient practice, Kim Essex, said the latest research found food technologies must be introduced to consumers using the right combination of scientific fact and emotion to unlock acceptance before foods made with

technology are brought to market.

Earlier research by Ketchum found the trick with getting consumers to accept new food technologies is getting the messaging right. The path to trust involves using clear language, communicating the right information to the right audience, explaining technical and scientific terms and testing messages, rather than simply making assumptions.

The take-home message is that the younger generations are listening and engaging. The successful food companies of the future will be the ones that learn how to talk with these consumers about new innovations.



# Mars Wrigley celebrates 40 years

Mars Wrigley Australia has celebrated the 40th birthday of its chocolate factory in Ballarat, Victoria.

The Ballarat site opened in November 1979 and today is a regional technical hub for Mars Wrigley's global brand development and innovation pipeline. Many of Mars Wrigley's most celebrated innovations including Pods and M&M's Honeycomb were invented in Ballarat.

In 2018, Mars invested \$14 million into the Ballarat factory to maintain and upgrade its operations. This followed a \$50 million investment in 2012 to build a new Maltesers production facility at the site, one of four Mars factories in the world that manufactures and exports the extremely popular Maltesters.



General manager of Mars Wrigley Australia, Mr Andrew Leakey, said the success of the Australian business is a testament to the hard work and passion of Mars Australia's employees, referred to as 'associates' by Mars globally.

"Their commitment and our principles-led culture has allowed Mars Australia to continually be recognised as the number one FMCG

manufacturer in the Australian 'Great Place to Work' rankings," Mr Leakey said.

The Ballarat factory employs 350 associates and produces some of the world's best-known confectionery, including Maltesers and M&M's. Milky Way and Mars Bars were the first products to roll off the factory's main lines, and today the factory produces 18 billion chocolates every year.



Edith Cowan University researchers will get to the heart of which vegetables can best prevent cardiovascular disease thanks to a National Health and Medical Research grant worth almost \$640,000.

Dr Lauren Blekkenhorst, a post-doctoral research fellow in ECU's School of Medical and Health Sciences, has been awarded \$639,725 over five years to identify

which vegetables offer the most protection against heart attacks.

The research will build on Dr Blekkenhorst's previous work, which found that eating vegetables high in nitrate such as spinach, arugula and lettuce, may reduce the risk of heart disease and stroke by up to 40 per cent.

"Heart disease claims the life of someone every 12 minutes in Australia, making it our leading

cause of death," Dr Blekkenhorst said.

"We know that eating a wide variety of vegetables can reduce your risk of heart disease. This grant will allow me to dig deeper and look at which specific vegetables provide the greatest reduction in risk."

Dr Blekkenhorst will also explore what particular compounds in vegetables provide the protective effects against heart disease.

Dr Blekkenhorst's NHMRC-funded research will focus on three types of vegetables. Cruciferous and allium - as there are particular sulphur-containing compounds found almost exclusively in these vegetables which may help prevent heart disease - and leafy green vegetables - as they are a rich source of inorganic nitrate, which Dr Blekkenhorst's previous research has shown may protect against heart disease.

The first part of Dr Blekkenhorst's project will involve studying the diets of more than 500,000 people around the world to establish which types of vegetables are associated with a reduced risk of heart disease. They will then establish causal effects by using randomised controlled trials to show definitively which vegetables are the best for heart health.



## Hilton Foods Australia opens \$190m meat production facility

Hilton Foods Australia has unveiled a \$280 million meat production facility in Heathwood, Queensland. The investment, which is underpinned by Hilton's long-term national supply partnership with supermarket chain Woolworths, will see the facility on the outskirts of Brisbane produce fresh meat products for more than 450 Woolworths stores across Australia.

Hilton Foods Australia CEO Pat

McEntee said the technology at the plant is set to drive a step change in consistency and quality of fresh red meat at its stores, as well as improve stock availability across more hours of trade for shoppers.

"We value our partnership with Woolworths and look forward to assisting in developing a faster and fresher supply of high-quality meat and value-added products," said McEntee.



The Heathwood facility features Australia's second-largest rooftop photovoltaic solar installation, which will provide around 50 per cent of the site's energy needs.

The news follows Hilton Food Group and Woolworths extending their meat supply agreement in 2018.

## FSANZ Regulatory Science Strategy 2019–2023

FSANZ has released its 2019–2023 regulatory science strategy, which aims to ensure Australia's food system remains prepared to respond to global challenges, trends and emerging risks. The strategy describes how FSANZ will continue to align its work to ministerial priority

areas and sets out its plan to grow its scientific and risk analysis capabilities, and its scientific evidence base and risk assessment methodologies, to underpin standards setting activities.

Through the new strategy FSANZ aims to build stronger links with academia and industry, further

leverage resources through strategic partnerships and communicate its science to meet the needs of its stakeholders.

The Strategy is available on the FSANZ website at [foodstandards.gov.au/Publications/RegulatoryScienceStrategy](http://foodstandards.gov.au/Publications/RegulatoryScienceStrategy)



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## Uncommon partnership launches innovative food company

Scientists, big business and entrepreneurs have formed an uncommon partnership to launch v2food, an Australian plant-based meat company.

v2food, an Australian startup with potential global outreach, is the product of collaboration between CSIRO, Main Sequence Ventures (CSIRO's innovation fund), Hungry Jack's and founding CEO, ex-PepsiCo research director Nick Hazell.

v2food aims to service the multi-billion dollar global plant-based meat market. Following the first design workshop in August 2018 and company formation in January 2019, the company launched the Rebel Whopper by Hungry Jack's with a plant-based meat patty by v2Food, in October 2019, a testament that rapid innovation is possible when scientists, big business and entrepreneurs collaborate to address a market-led opportunity.

The development of the company is an example of a new 'venture science' approach to innovation. The delivery of a new plant-based meat



L-R: Phil Morle (CSIRO Main Sequence Ventures), Nick Hazell (v2food), Prof Martin Cole (CSIRO), Dr Mary Ann Augustin (CSIRO) and Jack Cowin (Hungry Jack's).

pattie at commercial scale within ten months of formation was possible because of collaboration, including with a large go-to-market partner - a crucial element that allowed rapid prototyping and focused the research effort on a consumer outcome - and injection of venture capital. The model uses design-led thinking to bring a transdisciplinary research team together around a market opportunity, with a focus on the opportunity and developing strategies that enable new products to fill a market gap.

The venture science model is

now being used to develop the concept of a 'venture kitchen'. This kitchen examines ingredient and food product development based on first principles in science to develop nutrient delivery platforms to feed the world sustainably and provide culturally acceptable diets for various populations.

The uncommon partnership, grounded in sound science and scaled through joining with corporations, is the future of new food companies to operate on a global scale.

## ARC training centre for uniquely Australian foods

New government funding of \$3.6 million will be used to establish a research training centre to develop selected native Australian crops, food and ingredients. The aim is to help create new opportunities in the food, tourism and health sectors in relation to bush tucker, while also showcasing native Australian cuisine to the world.

Research at the Australian Research Council (ARC) *Training Centre for Uniquely Australian Foods* will focus on seven promising native plant groups with the potential to become branded food products: native herbs and spices, native fruits, native nuts, kakadu plum, wattle seeds, native honey and native seaweed.

Federal Minister for Education Dan Tehan said the research will give Australians a better understanding of our unique native foods and their health benefits, leading to new

products, new uses, new business opportunities and new jobs.

"The training centre will equip early career researchers with skills in sensory, nutritional and toxicological studies," he said.

Member for Groom John McVeigh, who launched the centre, said it will also have a heavy focus on indigenous participation.

"The centre will have Indigenous partner organisations and an Indigenous governance group to help create sustainable business models and to oversee how we apply traditional knowledge to branded products," Dr McVeigh said.

Expected outcomes include technical information to support branding and market development, best practice development in social factors and legal arrangements for benefit sharing, and a cohort of trained and industry-ready



researchers who can lead the native foods industry forward.

The University of Queensland will administer the training centre in collaboration with five participating organisations across two countries that will contribute a total of \$5.8 million in cash and in-kind support.

Participating organisations include: Australian Native Food and Botanicals, The trustee for Kindred Spirits Foundation, Karen Shelldon Catering, Beeinventive Pty Ltd and Venus Shell Systems Pty Ltd.

# The next generation of agricultural crops



A new major research centre to be based at the University of Queensland will identify the next generation of agricultural crops that can withstand the effects of climate change and increase food security. Government funding of \$35 million will establish the Australian Research Council (ARC) Centre of Excellence for Plant Success in Nature and Agriculture.

UQ vice-chancellor and president, Professor Peter Høj, said the centre will deliver innovative and world-leading research to improve crop resilience and boost yield which will help provide solutions to the critical issues of climate change and food security.

"The ARC Centres of Excellence scheme funds highly innovative and transformational research and this is the ninth Centre of Excellence established at UQ, which is an outstanding achievement," Professor Høj said.

Director of the new centre, University of Queensland's Professor Christine Beveridge, said around two-thirds of the world-wide human calorie intake comes from just three plant sources - wheat, rice and corn, and therefore future-proofing these crops against diverse climates including drought, and expanding gains in diverse plants is a must in order to improve food security for the projected 25 per cent increase in world population over the next 30 years.

The Centre will lead a global research network to translate novel genetic discoveries into on-farm crop productivity.

The University of Queensland will collaborate with four Australian universities and CSIRO, as well as 12 other academic and industry partner organisations from Australia, Europe, Asia, USA and Canada.



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**Queensland**  
Ph: (07) 3376 9411  
[roweqld@rowe.com.au](mailto:roweqld@rowe.com.au)

**South Australia & NT**  
Ph: (08) 8186 0523  
[rowesa@rowe.com.au](mailto:rowesa@rowe.com.au)

**Victoria & Tasmania**  
Ph: (03) 9701 7077  
[rowevic@rowe.com.au](mailto:rowevic@rowe.com.au)

**Western Australia**  
Ph: (08) 9302 1911  
[rowewa@rowe.com.au](mailto:rowewa@rowe.com.au)

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## Anne-Marie Mackintosh joins AFGC

Anne-Marie Mackintosh has been appointed to the role of policy manager, nutrition and regulation, with the Australian Food and Grocery Council.

As an accredited practising dietitian with more than 25 years experience, Anne-Marie has worked in nutrition, food reformulation, food regulation and food supply across a variety of sectors including food industry, non-government, government and clinical.

Ms Mackintosh has food policy experience with the NSW Ministry of Health whilst implementing a healthy food and drink policy in healthcare facilities, as well as corporate experience as a nutritionist for global food companies including Cereal Partners Worldwide and PepsiCo,

strategically driving and delivering a nutrition agenda both internally with staff and externally with stakeholders. Ms Mackintosh helped Cereal Partners Worldwide to become one of the first companies to have HSR packaging, and helped all of Uncle Toby's cereal portfolio to attain an HSR rating of four or more.

Additionally, Ms Mackintosh has chaired the Dietitians Association of Australia Food Regulation Working Group for eight years, writing food standards submissions to FSANZ and was the DAA's representative on FRSC roundtables.

Ms Mackintosh is a member of the Federal Government's Healthy Food Partnership Reformulation Working Group, a voluntary initiative



with the food industry, public health/ non-government organisations and academics. A key objective of this partnership is to work collaboratively to set nutrient benchmarks for key food categories to improve the food supply.

## Bill Heague returns to lead Mars Food Australia

Mars Incorporated has appointed a new General Manager, Bill Heague, to lead Mars Food Australia, the local arm of one of the world's most successful privately-owned manufacturing businesses.

Mr Heague originally joined the Mars company in 2008 as Sales Manager for Mars Food Australia, the manufacturer of some of Australia's most loved food brands including Masterfoods, Uncle Ben's, Dolmio and Kantong.

Following a successful five-year stint with Mars Food in Australia,

Mr Heague relocated to Europe to take up the role of Market Director, Multisales, for Mars in the Czech Republic and Slovakia. Mr Heague then managed Mars' Irish Multisales business from 2018, before returning home to Sydney and taking up his new role with Mars Food Australia.

Mr Heague said he is thrilled to be returning to Mars Food Australia.

"I'm a foodie at heart and very excited about the major advances and significant challenges we are seeing in the food industry, both in Australia and around the world, and



the innovation that our business can bring to the table," Mr Heague said.

## Deon Mahoney new head of food safety

The Produce Marketing Association Australia and New Zealand (PMA A-NZ) has appointed Deon Mahoney it's head of food safety.

Mr Mahoney has over 30 years' experience working in food safety across the world. In his role as head of food safety, Deon Mahoney will provide high level technical support and guidance under the PMA A-NZ food safety pillar, with the goal of ensuring the safety and suitability of fresh produce.

Mr Mahoney has considerable experience working in food safety

across a wide range of disciplines and industry sectors. This includes roles covering the development of food safety policy, microbiological risk assessment, risk communication, development and enforcement of food legislation, quality assurance, and training and education.

Mr Mahoney's previous work for the World Health Organisation and the Food and Agriculture Organisation, with Food Standards Australia New Zealand and a State regulatory agency has seen him develop and publish a wide range of technical guidance material, provide



forward-looking scientific advice addressing factors that impact the safety of food products.

## John Varcoe appointed Cheetham Salt quality manager



John Varcoe has joined Cheetham Salt Ltd as group quality manager overseeing food safety and quality programs across the Australian, New Zealand and Asian operations.

Mr Varcoe spent 23 years in the food manufacturing industry working his way to technical director, before stepping into the retail world and joining Coles supermarket group where he was responsible for shaping and managing the core supplier quality programs for the \$8 billion Coles-branded private label business, and was the architect behind the Coles Quality Academy.

After six years with Coles and gaining the opportunity to explore and work with global best practice manufacturers, he then formed his own consultancy company Quality Associates Pty Ltd.

Quality Associates rapidly grew to a national company with over 50 employees servicing many well-known brands. After six years he divested his interest in the company and joined the Cheetham Salt Group.

Mr Varcoe said it is exciting being a part of a global market leading company and being entrusted to supply the world's most essential mineral, which touches all our lives in some way.

## New food science lecturer for the University of Tasmania



Dr Matthew Wilson has relocated from Launceston to Hobart to start a new position as a lecturer in food science at the University of Tasmania. Dr Wilson will be based within the Tasmanian Institute of Agriculture's Centre for Food Safety and Innovation, and will teach and research on food science, regulations and technology. He previously worked as a postdoc in the ARC Training Centre for Innovative Horticultural Products, based at Newnham.

Dr Wilson's research interests

specialise in the field of food packaging, quality and shelf life, including understanding how innovative packaging techniques can extend shelf life and preserve quality of fresh fruits and vegetables. More broadly he is investigating cultural and management conditions influencing the growth and development of horticultural crops, as well as plant physiology, nutrition, pollination and plant extract production. He is also interested in using gas chromatography and sensory evaluation techniques.

## Dr Vassilis Kontogiorgos

Dr Vassilis Kontogiorgos has been appointed to the role of senior lecturer in food chemistry, school of agriculture and food sciences at the University of Queensland.

Dr Kontogiorgos received B.Sc. and M.Sc. degrees in food science from the Aristotle University of Thessaloniki (Greece) and a full scholarship from the Greek State Scholarships Foundation (I.K.Y) for PhD studies in food science at the University of Guelph (Canada).

Following his PhD degree Dr Kontogiorgos worked as a NSERC research fellow at Agriculture and Agri-Food Canada, and as an academic at the department of biological sciences at the University of Huddersfield, before joining the University of Queensland.

Dr Kontogiorgos' research

interests are focused in the area of chemistry and physical chemistry of food macromolecules, gels, emulsions, and polysaccharide characterisation. Currently, he is working on the physical, chemical and technological properties of soluble and insoluble fibres extracted from agricultural wastes. Dr Kontogiorgos is also associate editor of Food Hydrocolloids and associate editor of Food Biophysics.



## IAEF lifetime achievement awards

Three AIFST fellows, Minh Nguyen, Janet Paterson and Jay Sellahewa were honoured with International Association for Engineering and Food lifetime achievement awards on 26 September at ICEF13 in Melbourne. Mr Nguyen, Ms Paterson and Mr Sellahewa were active members of AIFST's food engineering group in NSW for many years.



**Minh Nguyen**

*The Universities of Western Sydney and Newcastle*

Highly recommended for contributions in membrane processes of foods.

Mr Nguyen is a pioneer in food engineering education in Australia, a past president of AFEA, and the current IAEF country representative.



**Janet Paterson**

*The University of NSW*

Recognised for her outstanding contributions to the food engineering profession by applying her industrial experience to academic research and education, teaching in food science and technology and chemical engineering degrees at UNSW. She is also the first woman to receive the award.



**Jay Sellahewa**

*CSIRO and the University of NSW*

Mr Sellahewa has made a significant contribution to industry, the research community and the food engineering profession through managing multi-disciplinary groups and projects and in the successful commercialisation of research in the agrifood sector in Australia and overseas.

## Martin Cole new head of agriculture, food and wine

Professor Martin Cole has been appointed the new head of the University of Adelaide's School of Agriculture, Food and Wine.

Professor Cole is internationally regarded for his work as a food scientist, with expertise in food safety, food trends and innovation, processing and nutrition, and the translation of science into community and commercial outcomes.

In his new role, which begins in February 2020, Professor Cole will have overall responsibility for the teaching and research efforts in the School of Agriculture, Food and Wine, based at the University's Waite campus.

Professor Cole is an internationally recognised food scientist and visionary science leader, with impacts across government, academia and industry. He has held senior management roles in research and industry in Australia, the US and Europe and served

as an expert for various global organisations including WHO and FAO and committees including the UN Food Security Committee and the International Commission on Microbiological Specifications for Foods.

Known for his strategic, science-business leadership, Professor Cole led the development of the National Food and Nutrition Strategy and Roadmap in Australia and developed business partnerships with significant impactful commercial outcomes for novel food technology, diet programs and agricultural bio-products.

The University of Adelaide's new strategic plan, Future Making, has identified agrifood and wine as a key industry engagement priority, and food security, environmental sustainability and good health and wellbeing as among the grand challenges to be addressed.

Professor Cole is a fellow of AIFST and was recognised for his



achievements within food science and technology in the wide areas of research, industry and education by the Institute, being awarded the Keith Farrer Award of Merit in July 2020.

## Vale June Olley: a trailblazing seafood scientist

Professor June Norma Olley AM FTSE, FAIFST was a world-renowned seafood technologist and influential role model for women and girls in STEM.

Born in South London on 2 March 1924, she had a love of science from a young age. Although her father “didn’t believe in education for girls,” her mother succeeded in enrolling her in a good boarding school, a substantial expense for the working class family.

The young Professor Olley was so devoted to her studies that her teachers blocked out the windows of the science library so she could work there at night during the London blitz. She received a Bachelor of Science with honours from University College London in 1944, and her PhD in 1950.

Shortly after, Professor Olley joined the Torry Research Station at Aberdeen, a laboratory focused on seafood technology. Her particular expertise was fish lipid biochemistry. She did fundamental research on the nutritional value of oils like omega 3 and practical research on the production and use of fishmeal.

Professor Olley had an extraordinary scientific acumen and gained a global industry reputation for troubleshooting seemingly intractable problems. This was especially remarkable considering the cultural and institutional barriers women scientists faced at the time. Over her 18 years with the Torry Research Station, she worked in countries including the US, Israel and Italy.

In 1968, Professor Olley moved to Tasmania, where she joined the CSIRO Division of Food Preservation at the Tasmanian research laboratory and married Frank Cumberae-Stewart.

There she led a number of projects, including modernising the burgeoning abalone industry and investigating the effects of heavy metal pollution on seafood stocks.

In 1976, Professor Olley was elected one of two women foundation fellows of the Australian Academy of Technology and Engineering (then the Australian Academy of Technological Sciences).

Professor Olley published more than 100 papers and played crucial roles in fish industry projects across the world, from South Africa to South East Asia.

The most important work of her career was on temperature function integration, bacterial growth rates and rates of deteriorative change in stored foods. She always maintained a high level of industry liaison to ensure her work had real impact.

She also attained a prodigious list of other honours, including:

- Doctorate of Science from the University of London, 1968
- Senior vice-president of the Tasmanian Royal Society, 1973-1974
- Award of Merit from AIFST, 1986



- Membership of the Order of Australia, 1987
- Honorary Doctorate of Science from the University of Tasmania, 1989

In 1989 Professor Olley retired from CSIRO and became an honorary research associate in the then Department of Agricultural Science and also the Department of Civil and Mechanical Engineering at the University of Tasmania.

Professor Olley continued to pursue her research into aspects of fish technology and microbiology and contributed to a number of scientific papers and a microbiology textbook.

She was a member of the Academy’s Climate Change and Education Forum, Membership Selection Panel and Tasmanian Division well into her 80s.


Professor Olley’s greatest legacy was her ability to lead by example and inspire young researchers (both men but especially young women) to maintain high standards and to challenge conventions. June also worked productively and collaboratively with colleagues from diverse disciplines. Many students and fellow scientists have benefited from her unique wisdom, mentoring and support. She continued these activities, including co-authoring publications, providing feedback on research students’ written work, and providing new scientific perspectives and insights to colleagues until her sudden, but peaceful, death.

Professor June Olley AM FTSE died on 29 July 2019, aged 95.


# Taming the Tsunami of Plastic Waste







The pressure to curb use of plastic packaging is mounting, and it's prompted food and beverage companies and foodservice chains to come up with some creative solutions that are recyclable, reusable, biodegradable, or compostable.



In the annals of photographs that changed history, the 2015 photo of an olive ridley sea turtle may not be the Hindenburg dirigible blowing up in 1939, Neil Armstrong on the moon in 1969, or the man holding off a tank column in Tiananmen Square in 1989. But the image of a turtle captured off the coast of Costa Rica with a plastic straw up its nose accelerated a global movement against plastic disposables and packaging—and now is rippling through the consumer packaged goods (CPG) and foodservice industries.

Also amplifying consumer alarm have been documentaries such as BBC's *Planet Earth II* that chronicle the contagion of plastic waste in the great outdoors. Throw all of that emotional messaging into the echo chamber of social media, and it has created rapidly coalescing worldwide outrage over single-use plastic.

"It has really galvanized consumer action against plastic," says Chase Buckle, trends manager for GlobalWebIndex, a consumer research firm based in London and New York City. "And the war on plastic is part of a wider shift toward consumers taking a leading role in all things green."

Indeed, plastic waste has become Public Enemy No. 1 in the food and beverage business these days. As a result, traditional packaged goods giants, huge restaurant chains, and startups in both businesses—and their packaging suppliers—are scrambling to create new single-use plastic packages that are recyclable or biodegradable—or, preferably, are reusable or eliminate plastic altogether. As part of this ethos, in fact, many companies are performing thorough reexaminations of their approach to all their packaging.

#### A Rising Tide of Consumer Concern

Yet their response still can't keep up with a tsunami in public sentiment that continues to shift massively against soda and water bottles, plastic bags, and plastic straws, and simultaneously to elevate commitment to a "circular economy." The concern has rocketed from a marginal plaint of environmentalists to one that is at the very center of green sensibilities, nearly on a par with discussions of climate change.

WestRock, a giant paper and packaging supplier, shares research with clients that shows that 74% of consumers now say materials used in packaging are an

important way companies can show interest in and support for the environment.

"It's a gatekeeper concept for consumers and a representation of that company," says Jeremy Keenan, strategic marketing director for the Atlanta-based company. "They're competing on-shelf for presence, and consumers will choose the product and brand that connects with them on sustainability measures."

More than 60% of consumers are likely to switch

*Concern has rocketed from a marginal plaint of environmentalists to one that is at the very center of green sensibilities, nearly on a par with discussions of climate change.*

away from a brand that they don't believe is sustainable, according to research with American and UK consumers conducted by GlobalWebIndex. And 56% now are likely to pay more for products they perceive as sustainable, up from 40% in 2011.

All this attention and concern is hardly surprising. The world seems to be literally choking on single-use plastic. While some still argue about the science behind man-made global warming, there is little argument with the evident ravages of plastic wastes that aren't quarantined and hidden in landfills. Out in the ocean, there is a NASA-measured "gyre" of plastic wastes of various concentrations that has become the size of Alaska. Microcapsules of broken-down plastics are said to inhabit every creature that plies the seas and end up in human digestive systems.

*This is an excerpt from the article "Taming the Tsunami of Plastic Waste" by freelance writer Dale Buss, which appeared in the July 2019 issue of Food Technology magazine.*



Read the complete article at [ift.org/foodtechnology](http://ift.org/foodtechnology).



## Agriculture & food tech - paddock to plate

AIFST was pleased to be involved in the Agriculture & Food Tech - Paddock to Plate workshop for teachers, held in Sydney in October. It included real world insights into the food industry, innovation in food technology and food safety, supported by case studies that could be used to inspire students.

FoodEdu in conjunction with the Professional Teachers Council of NSW ran its second Agriculture and Food Technology workshop in October for Secondary School teachers of food technology. Presenters supporting the event represented a number of industry sectors including Fiona Fleming MD AIFST, Alan Edwards Snr Food Incident response and Complaint Coordinator NSW Department of Primary Industries, Daniel Mullette R&D Director Campbell Arnott's as well as AIFST members from FoodEdu Duncan McDonald and David Welch.

The programme included in-depth presentations, interactive breakout sessions, and provided participants with in-class teaching resources. Teachers received up to date information regarding food innovation trends; food product development processes; food preparation and processing, with considerable attention drawn to practical insights for allergen management; and product recalls. A key session facilitated by Fiona covered career



David Welch, Alan Edwards, Fiona Fleming and Duncan McDonald.

opportunities in the Agrifood sector.

This professional learning day was accredited by the NSW Education Standards Authority (NESA) to be able to contribute towards mandatory professional development requirements for teachers.

## An evening of food and nutrition science in Adelaide

The Bachelor of Food and Nutrition Science program joined forces with Food South Australia and AIFST to put on a careers evening for current food and nutrition science and AIFST students.

Dr Steven Lapidge was the MC for the evening. Dr Lapidge is the inaugural CEO of the Fight Food Waste Cooperative Research Centre (CRC) and a non-executive Director of AIFST.

The event included short presentations from graduates showcasing different career outcomes, a presentation on student employability and presentations from Food South Australia board members and Catherine Sayer, CEO of Food South Australia. The evening concluded with an opportunity for networking with various food/nutrition organisations as well as members of Food South Australia and AIFST.

## Chocolate 101



Emma Rowe, Fipe Preuss and Lyn Davies.



Martin Eagle, Mark Alton and Leo Bohorquez.

On Tuesday 12 November the AIFST Chocolate 101 event was held in Melbourne. The night took a deep dive into the world of cacao and chocolate. Attendees learnt about the magic of chocolate from three experienced speakers, Alan Mortimer, Juraj Durco and Neil Smith.

AIFST would like to thank our event speakers and attendees for contributing to such an exciting event.

## Food and beverage packaging forum (WA)

A strong interest in sustainable packaging and trends resulted in the State Government delivering a packaging forum to the WA food and beverage industry in October 2019. The Department of Primary Industries and Regional Development partnered with AIFST and the Australian Institute of Packaging to deliver the full day program which attracted nearly 100 attendees.

Participants included primary producers, small and large scale food and beverage manufacturers, food service companies, industry service providers, tertiary institutions and government departments.



*Jon Day, Shopability, Patricia Elphinstone, DPIRD, Amelia De Groot, DPIRD, Ralph Moyle, AIP, Nikki Poulish DPIRD.*

## Newcastle University product development competition



*Carilee Hicks, April McElligott and Ji-Hun Lee.*

Food science and human nutrition students at the University of Newcastle (UoN) displayed new food products at the Central Coast campus on 30 October 2019. The expo-style event was part of the students' third year product development course, which involves turning innovative ideas into final products within just 12 short weeks. The theme for products this year was "food from functional ingredients".

The following products were featured

'Power slice' breakfast bars are made using a by-product of soymilk production. This ingredient, called okara, is rich in dietary fibre, proteins and bioactive compounds including soy saponins and flavonoids, which are linked with health benefits. The okara is mixed with flour, fruit, nuts, oats and coconut into a nutritious breakfast to eat on the go.

'Jammed Packed' is a revolutionary new jam prepared from natural ingredients including mixed berries, chia seeds, maple syrup, acai berry powder, beetroot powder and apple juice. It boasts no refined sugar and is high in antioxidants, making it a healthier alternative to traditional jam.

'Dough & Go' is an innovative, ready to eat dough dessert flavoured with chocolate, coconut and macadamia. Dough & Go is rich in fibre with seven grams per serve, which equates to 28 per cent and 18 per cent



*Unbeetable Brownies team - Charlotte McIntyre, Michael Oksinki, Bianca Russell and Francesca Mangini.*

of the daily-suggested intake of dietary fibre for adult men and women respectively.

'Kale'd it' pizza bases are made with freeze-dried kale, which is rich in fibre and vitamins, especially carotenoids lutein and zeaxanthin, functional compounds both linked with eye health.

'Unbeetable brownies' are not your typical slice. The brownie is 25 per cent beetroot puree, mixed with nuts and gluten free flour and fortified nut milk boasting a low four per cent sugar content. Currently there is a hole in the market for prepared vegan foods and as beetroot is a rich source of vitamins, minerals, antioxidants and dietary fibre it gives these brownies added health benefits.

Approximately 150 people attended the event, including representatives from AIFST, Central Coast Industry Connect and local food manufacturers including Sanitarium, Mars Food, McCain Foods and Ingham's. There were also 40 PTECH students from Wyong High School who participated to broaden their knowledge about careers in the food industry. The event concluded with the election of a people's choice product, based on its sensory performance and promotional information. Unbeetable Brownies lived up to their name, winning people's choice. The four members of the group received one year's free student membership to AIFST.

## Vegan and healthy products win at William Angliss food science showcase



Sandra Loader.

Vegan and healthy food alternative trends featured at the 2019 Student Product Development Showcase for Diploma of Food Science and Technology students at William Angliss Institute.

All final year students from the Diploma of Food Science and Technology participated in the student product development showcase, a major assessment piece assessed by a panel of industry experts.

Products developed ranged from cauliflower fettuccine and organic vegetable soup to rhubarb apple chutney and high-protein chocolate hazelnut spreads.

Three products also featured dehydrated ingredients, including asparagus spears and a dehydrated concentrated dissolvable vegetable stock cube.

The overall winner sponsored by AIFST, and the people's choice award



Lisa Foster, Gregory Duke and Danika Elley.

winner was Gregory Duke with his vegan gluten-free, nut-free, crumbed and deep-fried soy-free snacks.

"My initial idea started with the idea of a deep-fried mozzarella stick which I wanted to make a healthy alternative of, that vegans could also enjoy," Gregory said.

The runner up was Danika Elley with her heart-shaped, dissolvable tea portions which allow brewing tea without any sort of packaging such as the traditional tea bag.

A delicious chicken, corn and quinoa soup was awarded third prize for its healthy organic ingredients and clever packaging, made by Lisa Foster.

Food processing coordinator Kathy Majstorovic said she was very impressed with the students' hard work and results.

"Although this project is focussed on the actual product innovation, every student also developed

sustainable packaging for their new food," Ms Majstorovic said.

Students displayed their products, offered samples and talked about the process of developing their product from idea through to final delivery.

They were assessed based on the entire scope of the project, including whether the product had the potential to succeed in the marketplace and whether they had delivered sufficient description of the manufacturing equipment as well as completing a shelf life test. They also had to complete a cost analysis and a mock up of the package with labelling requirements to meet FSANZ standards.

During the launch event, industry judges then assessed the products on innovation, sensory acceptability, market potential, presentation and packaging.

## Food recall workshop

In November, the third AIFST Food Recall Workshop for 2019 was held in Melbourne, at GS1 Australia. The workshop demonstrated the skills to implement, evaluate and test recall policies and procedures and included a hands-on recall scenario requiring participants to work through the recall process.

AIFST welcomed team members from Foodbank Victoria to the workshop.



Daniel Parsons-Jones, Peter McGee, Andrew Brown, Fiona Fleming and Sunil Lakshmanasinghe.



# SAVE THE DATE-2020 AIFST CONVENTION 6-7 JULY

## FOOD SCIENCE REVOLUTION - BUILDING A SUSTAINABLE FUTURE

The AIFST Convention is to be held on 6 & 7 July 2020 at the Melbourne Convention and Exhibition Centre (MCEC). This year, the convention will be co-located with foodpro.

The Convention theme is Food Science Revolution – building a sustainable future.

The 2020 AIFST Convention will once again bring together an exciting, diverse and experienced line-up of international and local speakers to share their knowledge, insights and learnings about what the future holds for the food industry both here and beyond our shores.

## WHAT CAN YOU EXPECT IN 2020?

AIFST20 will feature four concurrent streams with keynote speakers in the plenary sessions on each of the two days.

The 2020 AIFST Convention will feature networking opportunities including the Young Professionals & Mentoring Networking Breakfast and the Wine & Cheese Tasting Sensation.

## WINE AND CHEESE TASTING SENSATION - 6 JULY 2020

The ever-popular Wine and Cheese Tasting Sensation remains a key part of the social program and will be held on Monday 6 July 2020.

## CALL FOR RESEARCH POSTER PRESENTATIONS

AIFST is calling for Poster Presentation submissions. The competition provides a space for scientists to present a summary of their recent work in poster form. As space on the poster is limited, the challenge for entrants is to effectively condense their research without losing the quality of their research.

For more information visit the AIFST website. To be eligible for a poster presentation, at least one of the authors must be registered to attend the Convention. To submit a poster, please use the provided poster template on the AIFST website and submit to AIFST via [aifst@aifst.com.au](mailto:aifst@aifst.com.au) by close of business on Friday 29 May 2020.

## AIFST AWARDS PROGRAM OPEN FOR 2020

Applications are open for the 2020 AIFST Awards. Nominations close on Monday 27th April 2020. Winners will be presented with their award at the 2020 AIFST Convention.

Visit the AIFST website for all award guidelines and nomination forms.

## AIFST STUDENT PRODUCT DEVELOPMENT COMPETITION

The SPDC was created over 15 years ago to provide students with a chance to create a new product and demonstrate their skills, knowledge and creativity. Each year students are asked to create a product based on a brief and submit the development of their product at various stages to the judges. The theme for this year is **Rethinking Protein: Creating Products using Alternative Proteins**.

The competition culminates at the annual convention, where teams must present their final product to the judges and submit it for tasting.

## PARTNERSHIP OPPORTUNITIES

Partnership opportunities are available for companies wanting to link their brand with the Convention and extend their reach in the Australian food industry.

To discuss ways your organisation can participate in the 2020 AIFST Convention, contact AIFST today via email [aifst@aifst.com.au](mailto:aifst@aifst.com.au) or phone 0447 066 324, or visit the AIFST website [www.aifst.asn.au](http://www.aifst.asn.au)

Registrations to attend the 2020 AIFST Convention open in late February via the AIFST website. All Full Convention Registrations include a ticket to the Wine and Cheese Tasting Sensation. Early Bird Registration is available until close of business on Monday 18 May 2020. After this date full pricing will apply. AIFST offers individual and group booking options including corporate registrations and discounted packages. Contact us to find out more information.



# Continuing Professional Development

## Education and continuing professional development

Nelson Mandela said education is the most powerful weapon which you can use to change the world.

The world of food science and technology is changing rapidly and, as an industry, we need to ensure we keep up to date with changes.

This year, education will be a major focus for AIFST as we develop and implement our 2020-2022 strategy built around the key priorities of grow, learn, connect and champion. As an organisation it is important AIFST supports the continued growth of the Australian food industry by building the skills, capacity and networks of food industry professionals to ensure they contribute value to the global operating environment.

### Why a CPD program?

In today's increasingly competitive and changing world, food scientists and technologists must stay at the cutting edge of new developments throughout their careers. It is no longer possible to rely on basic studies or on-the-job training to provide professional advice and service to our employers, customers and clients.

This means to continually improve our technical knowledge and skills we need to engage in continuing professional development. AIFST also recognises that in modern

organisations, food scientists and technologists are increasingly responsible for developing their own careers. CPD allows you to enhance your future.

A CPD program reflects the professionalism of the members, improves their professional standing and enhances their employability by formalising and documenting CPD activities. It assists in keeping knowledge up to date and illustrates an ability to adapt to changing roles in the food industry and food production environment. Ensuring currency in a complex job market can be difficult and companies look for staff who bring a broad range of skills.

### What is a CPD program?

A continuing professional development program is an active self-planned and structured program for developing and enhancing your professional skills. Ideally, the program is designed with clear objectives, extends your professional knowledge and capabilities, and allows you to engage in a broad range of activities to increase your career options.

### The AIFST CPD program

The AIFST CPD program was launched in 2019. It is voluntary and designed to encourage members to maintain currency of skills and knowledge and assist with career

planning. It will provide recognition of experience and interests and align food scientists with other well-respected professions.

Much of AIFST members' skill set is developed over their working life but is not always part of their formal qualifications. The CPD program is intended to provide recognition of these activities and skills by formalising and recording the process in a straightforward and transportable way.

The best outcome for the food science community is to develop a recognised professional identity. The competence of members is vital to the development and credibility of food science practitioners and AIFST is committed to providing value to members by developing and supporting this program.

### How do I get involved?

Keep an eye out for member communications or talk to our Education and CPD Manager, Robin Sherlock ([education@aifst.com.au](mailto:education@aifst.com.au)).



# MENTORING MATTERS

Words by April McElligott



Numerous research papers studying mentoring programs conclude a distinct relationship between mentoring and overall professional growth, with findings noting how mentored individuals are more inclined to reach higher and greater career outcomes than non-mentored individuals.

The effectiveness of mentoring programs has been long understood by professionals in both public and private sectors as more and more organisations are actively seeking formal mentoring programs to recruit, gain access to fresh perspectives and build professional networks.

Equipping AIFST members with opportunities to learn, grow and connect has always been the core behind what drives the institute's membership offerings. This value is what inevitably catalysed AIFST's actioning of its mentoring program. In 2017, AIFST launched the pilot mentoring program, with seven mentees and seven mentors. The program ran for six months and despite only having 14 participants, received an overwhelming amount of positive feedback. It was clear to the team at AIFST that this program had significant potential to offer student and graduate members an opportunity to gain industry contacts, access tailored career building feedback and improve interpersonal skills whilst also providing experienced food industry professionals an opportunity to give back to the industry and share knowledge and expertise.

Following the success of the 2017 pilot, AIFST officially commenced the six-month program in March of 2018. The program had 49 participants, all coming from different stages in their careers and areas of the food science and technology industry. The number of participants grew by 55 percent in 2019 with 76 members partaking in the program. Over the two years this program has been running, AIFST has based pairings between mentees and mentors on similar career related interests, goals and geographic locations. This has proved to be a successful method of matching, particularly so in the 2019 Mentoring Program with 95 per cent saying the mentor/mentee they were paired with was a 'good' or 'perfect' match.

The Mentoring Program Handbook has been offered to mentors and mentees as an optional resource to help guide the direction throughout the six-month program. Each month is dedicated to a specific focus. Some of the foci include 'networking effectively', 'listening effectively', 'giving and receiving feedback' and 'work/life balancing'. With the positive feedback received from mentor-mentee pairings who used the handbook, it has proven to be a very useful resource.

At the 2018 and 2019 AIFST Annual Conventions, mentors and mentees were invited to attend the Young Professionals Breakfast. This provided the opportunity for mentors and mentees to meet in person if they had not had the opportunity previously. Despite some not being able to meet in person, many pairings got creative with technology and used video communication platforms such as Zoom and FaceTime to communicate with one another. Amongst all participants it was interesting to see how mentees and mentors were utilising emails, phone calls, LinkedIn and Google Hangouts to communicate. This followed from AIFST's advice and use of such platforms to conduct all 'catch up' session meetings offered to mentors and mentees. The sessions allowed for input from all participants about how the mentoring program was progressing for them and created opportunities for suggestions on ways to encourage better mentor-mentee discussions. The sessions provided the team at AIFST with an opportunity to receive feedback about areas in which the program could be improved and where more refinement was needed.

From the feedback received from mentors and mentees involved in the 2019 AIFST Mentoring Program, 82 per cent of participants described their experience to be of high quality. Overall, 85 per cent of participants said they would be very interested in participating in the 2020 AIFST Mentoring Program. 90 per cent of participants also agreed that the six-month duration of the program was the perfect amount of time to have a formal mentoring pairing run.

2019 mentee Surin, said "the mentoring program helped me to connect with industry professionals. My mentor guided me throughout the program and pointed out my strong points, which allowed me to identify where and how I can make contributions to the Food Science and Technology Industry."

Oprah Winfrey said "mentors are important and I don't think anybody makes it in the world without some form of mentorship. Nobody makes it alone. Nobody has made it alone." From witnessing the growth of many mentees and mentors involved in the program, Winfrey's comments could not resonate more with the team at AIFST. From an initial trial run of 14 people in 2017, to 76 people in 2019, it is clear how positively the program is seen by members. We can't wait to see what's in stall for the future of AIFST Mentoring Programs.

**April McElligott**, AIFST Membership Services Officer



# Food science has much to offer humanitarian aid

Words by Donna Rosa

Have you noticed that the latest advances in food science and technology, touted to feed the world, haven't really been leveraged to feed the world's hungry?

With all the whiz-bang technology and convenience that's been applied to food, the 26.4 per cent of the global population who experienced severe and moderate food insecurity in 2018 aren't reaping the benefits. It's high time we paid some attention to those who most need our expertise.

Thankfully, a new movement is afoot in the food industry to help address this need. An emerging field, called Humanitarian Food Science and Technology (HFST), offers innovative solutions to reduce food insecurity and malnutrition.

## What is HFST?

HFST is the application of food science and technology to enhance food security, health, and economic prosperity for global humanitarian and development purposes.

Food-related aid has traditionally

centred on humanitarian crises, agriculture in development, and nutrition in both. These are critically important areas for addressing food insecurity, but HFST seeks to create a more comprehensive food system that would allow food science to connect and enhance all three.

It can be utilised in both acute and chronic aid situations, and would incorporate long-term sustainability and food options that are precisely fit for purpose.

## Key characteristics

HFST's holistic and inclusive methodology includes the following features:

- Emphasises long-term development approaches to include prevention, relief, improvement and rehabilitation
- Implemented in consultation with local communities and other partners
- Utilises locally sourced materials and resources
- Employs culturally appropriate and

innovative food solutions

- Human centred
- Economically and technically feasible
- Sustainable
- Useful in both long-term development and emergency relief situations

HFST implementation is multidisciplinary, involving experts in nutrition, product development, food safety, compliance, process engineering and quality control. It also encourages partnerships with governments, the private sector, donors, NGOs, academia and other organisations. In addition, the design and execution of HFST projects requires the involvement of the intended beneficiaries, particularly women.

## The backstory

The field of Humanitarian Food Science and Technology was first organised after the 2017 AIFST Humanitarian Food Science and Technology Symposium, the first



conference of its kind in the world.

An international committee was formed to expand HFST globally and seek implementation of global aid work. The working group consists of representatives of AIFST, the CSIRO and the University of New South Wales, as well as representatives from UN agencies, universities, and individuals in Asia, Europe, and the United States.

The initiative is growing with the implementation of a new program sponsored by the international division of the Institute of Food Technologists (IFT). Over the course of three years, five teams of IFT volunteers will work with global food organisations, collect case studies, develop informative communications, build capacity for HFST work, and help execute real-world projects. IFT and AIFST are planning joint webinars, podcasts and other informational and outreach activities to increase awareness and interest in HFST.

### Exciting possibilities

The potential applications of food science in international development and aid are diverse and compelling, including:

- Improvements in nutrition, stability, sensory attributes and cultural relevance of emergency rations
- Shelf life extension through basic processing, natural preservation and better packaging to make food available during 'lean seasons' and reduce post harvest waste
- Value addition for local agricultural products and creation of inclusive value chains that increase profits, jobs and consumer choices and sustain resilience against future shocks
- Creative utilisation of nutritious local foods and ingredients and improved bioavailability of nutrients
- Innovative food engineering and robust, low-cost process development to enable efficient food production under difficult conditions, or utilise alternative sustainable energy sources
- Custom products for specific conditions, circumstances or

populations

- Improved food safety, quality and compliance through knowledge-sharing
- Waste reduction and reuse at every step of the humanitarian food supply chain

Every food science discipline has something to contribute to HFST, whether it's alternative protein research, sensory and behavioural science, carbohydrate chemistry or food storage options.

### A word of caution

HFST is about food that is nutritious, safe, affordable and compliant with local regulations and food habits. As scientists, we can sometimes get enamoured with technology, but this should never be the driver for what we do.

Food must meet situational needs first and foremost, and the creative use of technology, both old and new, is only a means to an end. In fact, despite the unquestionable benefit and importance of food science and technology, we should always remember that food should be as minimally processed as possible for optimal feasibility, affordability and nutrition.

### What's needed

With the establishment of this new specialised field, much work is ahead.

First, specific HFST curricula must be developed for universities globally. Trained and specialised food scientists are needed to set up food processing in challenging conditions such as ongoing power outages, sub-standard equipment, limited resources, unreliable and intermittent raw material supplies and weak supply chains, uneducated labour and a lack of compliance.

Second, affordable education and training are required to transfer the necessary skills to developing countries. We need to embrace E-learning as an effective and easily implemented tool to accomplish this. It is essential to have people on the ground (ideally locals) to properly develop and process foods. Capacity

building is also needed in regulatory, nutrition, and other supporting disciplines.

Third, it is critical to create awareness in the aid industry regarding the potential impact food science can have on reducing food insecurity. International development practitioners require accurate and well-documented information to encourage them to incorporate HFST in their programs, and convincing evidence will help persuade them to allocate the appropriate resources.

Successful incorporation of food science and technology in developing regions requires multilateral cooperation including the private sector, international governmental donor agencies (such as the UN, DFAT, USAID and GIZ), local governments and international and local NGOs. Food aid must move beyond traditional rations and agricultural practices to include local post-farm production and the latest advances in food technology and nutritional science.

Most food scientists can probably envisage ways to apply their expertise to end hunger in the world. Many want to help, but don't have a way to do so. HFST is the way. We must create a cadre of trained professionals with specific experience and understanding of the use of food science in developing and emerging countries, and then help the aid industry understand and implement it.

If you have questions, need further information, or would like to be involved in HFST, email the author at [donna@donnamrosa.com](mailto:donna@donnamrosa.com) or contact Fiona Fleming at [fiona.fleming@aifst.com.au](mailto:fiona.fleming@aifst.com.au).

*Donna Rosa is an international business development services consultant who provides business support to micro- and small enterprises in emerging nations. She specialises in food and agribusiness and offers advisory services such as business analysis, business plan development, market research, training, organisation development and coaching. [www.donnamrosa.com](http://www.donnamrosa.com).* 



# Have your say about food waste

Words by Emily Mantilla

The Fight Food Waste Cooperative Research Centre's (FFWCRC) Industry Connection Hub has launched a training needs analysis survey to help guide the development of new training programs and innovative education delivery mechanisms for Australian food businesses.

To get the Industry Connection Hub off the ground, the FFWCRC is asking all AIFST members and *food australia* subscribers to support the initiative by completing the survey themselves and sharing it widely with colleagues, collaborators and partners.

The survey component of the training needs analysis is a critical first step in gathering information on what are the training opportunities and what knowledge gaps need to be filled for Australian food businesses throughout the entire supply chain.

The training needs analysis survey results will ultimately deliver targeted training solutions that will help food businesses save money and help them learn and understand where they could

be saving money. It will also assist with the adoption of new, innovative ideas in business that will create new income streams from food waste.

Many food businesses could be making more profit from food waste, and the FFWCRC is currently looking for responses to this important survey from the Australian food industry, from each of the many different sectors and from all areas of the supply chain.

As such, the CRC is seeking responses from everyone involved in the food industry supply chain - growers, producers, farmers, those within the fishing and aquaculture industry sectors, harvesters, processors, value-adders, packers, those in quality assurance, sales and marketing roles, logistics, compliance (such as food safety, regulations and OH&S), wholesalers, retailers and food service.

The survey is focussed on four key areas:

- Opinions about where food waste is generated most in different parts of a food business

- What areas of training will have the biggest impact on reducing food waste in your particular business or sector of the food industry
- What training already exists in Australia or overseas that could be adapted or updated to make it more current or Australian focused
- How would you like training solutions and innovations delivered within your sector of the Australian food industry

Those who take part in the survey will go into a draw to win a \$200 VISA voucher, or a \$200 donation to a food rescue charity of your choice.

Please take 10 to 15 minutes to complete survey and be part of the fight food waste revolution in Australia: [www.surveymonkey.com/r/FightFoodWaste](http://www.surveymonkey.com/r/FightFoodWaste)

*Emily Mantilla works for Honey and Fox Pty Ltd (a participant company in the Fight Food Waste Cooperative Research Centre) and is the Industry Connection Hub Manager.* 



# It's never a cakewalk – how a meringue unravelled a food safety mystery

Words by the NSW Food Authority

The life of a foodborne illness investigator is never dull, and for the small group who make up the NSW Food Authority's Food Incident Response and Complaints team, each year certainly brings its fair share of varied and complex cases.

It was back in mid-2018 when reports of illness caused by *salmonella* Enteritidis first started to trickle in. By July 2018, with around 12 reported cases of people infected in NSW, authorities were able to determine there was a 'cluster' and commenced investigating the source.

*salmonella* Enteritidis (SE) is a bacterial disease of poultry and is high risk for causing foodborne illness in humans, particularly in those most vulnerable. SE is unique because it can be located both inside and outside of eggs and, as such, can be present in an egg even if the eggshell is clean and uncracked. While SE is present in most international egg industries, until this incident, SE had not been detected in NSW poultry.

In the end it was a humble piece of frozen meringue cake, forgotten at the back of someone's freezer, that cracked open the case and gave investigators their breakthrough.

In interviewing SE infected patients about the food they had been eating, one recalled eating the cake around the time of becoming sick. The residual cake, left over from a birthday party, gave cause for a second celebration when it led investigators through the maze of possibilities and

to the source of the outbreak.

The cake sample tested positive to SE and, using whole genome sequencing technology, officers were able to isolate the SE and determine it had the same whole genome sequence they could see in the group of people who had been ill.

The leap from freezer to farm is far from simple, and the complex investigation by NSW Health and NSW Food Authority officers to trace back the source was an exercise in finding the proverbial needle in a haystack.

Assessing the cake sample led officers to the cake manufacturer, and they were then able to investigate their practice, their environment, their food handling, their ingredients and their food supply chain.

This analysis then led investigators to an egg farm on the outskirts of western Sydney. An organism detected there was found to be identical to that causing the illness in humans, in other words, the smoking gun for food safety police.

Increased surveillance and monitoring of poultry farms undertaken in response to that finding revealed the bacteria spread to other properties around the state via people, eggs and equipment moving between them. In the end, 13 NSW poultry egg facilities and one Victorian poultry egg facility were found to have SE.


Steps taken to minimise the spread of the bacteria and consumer exposure to SE included movement restrictions, decontamination,

destocking of affected farms, consumer and trade level recalls, product withdrawals, consumer advisories and media notifications.

In order to help raise biosecurity standards for the industry over the long term, a biosecurity control order was issued on 1 August 2019, and will remain in place for two years. In the meantime, improvement in on-farm biosecurity standards will assist in minimising the risk to human health from SE.

The NSW Food Authority has developed a SE egg management program for all licenced egg farms and processors in NSW. The program outlines all biosecurity and food safety controls that must be implemented in order to comply with the control order, and help ensure eggs produced in NSW are safe to eat.

The SE management program includes requirements in licensees' existing food safety programs, as well as new hygiene and biosecurity practices that have been implemented in response to SE. This is just one example of work done to reduce Salmonella infections in NSW.

*The NSW Food Authority is part of the NSW Department of Primary Industries (DPI) and continues to work closely with other teams in DPI, NSW Health and the egg industry, to protect public health and minimise consumer exposure to SE.* 



# The Human Connection Project: shared meals for mental health

Words by *Matthew Boyce*

As you read this article, every single day across Australia we are losing eight lives to suicide<sup>1</sup>. In addition to this, in 2018, 4.8 million Australians were diagnosed with a mental or behavioural issue<sup>2</sup>.

What is more important to comprehend is that behind these alarming numbers are human lives - someone's father, mother, sister or son. It is not just those we lose to suicide that are affected. It is their families, their colleagues, their networks and their communities. You could be walking past someone on the street who is suffering and, in most cases, you would not even register that something might be affecting them.

The reason why I am so passionate about this space is that in 2015, after the loss of my best friend in an accident, I found myself struggling with the same issues. I had become socially isolated, in a depressive state and had occasional suicidal tendencies. I could have so easily become one of those

eight lives lost.

It was here I had an epiphany. The depression I was suffering wasn't caused by Justin's passing, however, my grief was. My depression was caused by a complete absence of human connection. I was surrounded by people, but I had built walls up to not let anyone in. I wasn't depressed from the loss of my best friend. I was depressed from the loss of connection with Justin and, in turn, loss of my community's human connection.

It was here I made a promise to educate and empower others to highlight the importance of human connection. It is no secret that our society has become the most digitally connected and, at the same time, the most socially disconnected we have ever been. We know that people are increasingly having feelings of disconnection and loneliness. We also know people who are more connected will become more resilient.

Between ourselves and our

ancestors, throughout history and across cultures, the importance of food traditions has continued. Food has progressed from being simply an essential input for human survival and evolved into a vehicle for giving us a sense of community and connection, which is something we also need and seek.

"Those who eat as we do have a connection with us; they are as we are"<sup>3</sup>. From this we know that sharing meals and conversations can be one of the best ways to increase connections between human beings. What we need to do now, as a society, is find ways to facilitate and create a platform for these connections to occur regularly and easily. The very connections that could save a life, or eight.

There is no 'cure' for depression as such, however, we can build and adopt preventative measures. The statement that depression is caused by a lowering of serotonin levels in your brain is one that I believe needs to be challenged,

however, this is not the place for that. What we do know is that your environment can play a part in your depression, and possibly quite a large part<sup>4</sup>.

Therefore, we must be conscious of the way we go about our lives and, more importantly, the connections we share. In the same way bees have evolved to need a hive to survive, humans have evolved to need a tribe.

Through my own journey, and through multiple research ventures, we have discovered the most powerful way to create and strengthen a human connection is over the action of a shared meal. It is on this basis that The Human Connection Project was built. The Human Connection Project is a multi-layered social enterprise which has four defining pillars:

1. Your Prep: a cooked meal kit delivery company, providing ready-to-eat elements to make #dinnertimematter again, as well as

2. Life Warriors: the charity arm of our enterprise, facilitating educational programs designed to teach youth about human connection and resilience
  3. How Good's Living: our community events sector running events that bring communities together for movement, connection and shared meals
  4. Connection Project app: this is currently in development, but will bring all modes together in one central place so communities can connect with us, and within themselves. It provides a platform for human connection and education which can begin online and be further developed offline in the real world.
- Through building The Human Connection Project we have already been able to impact more than 150,000 individuals across Australia.

We've also provided employment for some incredible talents who are themselves going through an adverse time in their lives either through disability or some other difficult situation.

If you would like to be a part of The Human Connection Project in any way, please reach out via any of our social media channels or directly via our website.

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*Matt Boyce is founder and CEO of the Human Connection Project, a social enterprise business making it easier for families to reconnect over healthy and nutritious meals.* ⓘ



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# Food research roundup: the other CRC projects

Words by Dr Martin Palmer

The Commonwealth Government Cooperative Research Centres (CRC) program has supported several major food research initiatives since its inception in 1991. Those currently funded include the Centres for Food Agility (<https://www.foodagility.com>), Fight Food Waste (<https://fightfoodwastecrc.com.au>), Future Food Systems ([www.futurefoodsystems.com.au](http://www.futurefoodsystems.com.au)), Honey Bee Products (<http://www.crchoneybeeproducts.com>) and Developing Northern Australia (<https://crcna.com.au>). These multi-partner, industry co-funded and industry-led CRCs run for up to 10 years, with Government contributions ranging from \$7m to \$75m per CRC. They are required to be established as incorporated companies and are well recognised within the food industry and research community.

Less well known is the research being undertaken under the CRC Projects (CRC-P) grants scheme, which runs in parallel with funding for the larger CRCs under the overarching CRC program. The CRC-P scheme is designed to support smaller projects of industry-led, collaborative research, for up to three years and with up to \$3m in matched funding.

In contrast to similar programs operated by the Australian Research Council, CRC-P funding is allocated directly to the lead industry partner, rather than the collaborating research organisation. Multi-party projects are encouraged and there is a requirement for involvement of at least two industry partners, including at least one SME and one Australian research organisation.

There have been eight CRC-P funding rounds since 2016. In the first 7 rounds, 22 projects were funded in the agri-food sector, attracting an average of \$1.9m per project. They cover a wide range of food production

and processing topics but have in common an industry-led, collaborative structure involving research organisations, technology providers, SME's and different businesses at the same or different points along the supply chain – just as this scheme is intended to promote.

This unusual approach brings with it new teamwork and research management challenges, as well as the opportunity for broader perspectives and experience to be brought into the project at an early stage. For technology development projects in particular, this can strengthen an end-user focus and provide a valuable opportunity for the research to be guided and evaluated at successive stages along the innovation chain.

The funding outcomes for CRC-P Round seven were announced in August 2019. One of these new projects - Live Inbound Milk Supply Chain Monitoring and Logistics for Productivity and Competitiveness - is an interesting example of how this multidisciplinary approach can be applied to complex challenges in the 'Food Industry 4.0' research field. This is a two-year collaboration between Swinburne University of Technology, Bega Cheese, Telstra Corporation and three Australian milk suppliers. The project aims to develop a system based on the internet of things (IoT) that allows live monitoring of an inbound milk supply chain involving 100 dairy farms and milk carriers, and a milk processor.


The data collected by the IoT sensors will drive dynamic milk pick up (re)scheduling as the milk quantity and quality varies, track adherence to pick up processes and enable highly accurate milk supply forecasting. These collectively enhance the chain's productivity and competitiveness. Led by Professor Dimitrios

Georgakopoulos, the project will use Telstra's new narrowband internet of things network, in conjunction with more than 700 electronic sensors, deployed throughout the supply chain.

It's also interesting to see how some of the earlier CRC-P projects are tracking. For example, one of the first to be funded (CRC-P Round 1) was on translational R&D to accelerate sustainable omega-3 production - a collaboration between Qponics Ltd (a Brisbane-based algal technology company), Nutrition Care Pharmaceuticals Pty Ltd and The University of Queensland. The aim of the project was to translate proof-of-concept technologies to achieve sustainable, organic production of omega-3 fatty acids from microalgae, including CO<sub>2</sub> and recycling, and power generation from solar panels and biogas, into a commercial-scale production process.

From recent media releases and information on the company website, it appears Qponics is now well on the way to achieving these objectives and establishing itself as a pioneer in this emerging industry sector (<https://qponics.com/>).

CRC-P Round eight closed in September and funding outcomes were due to be announced in December 2019. Round nine is expected to open in the first half of 2020. For more details of the CRC-P scheme and summaries of the projects funded to-date, please refer to the Australian Government website: <https://www.business.gov.au/Grants-and-Programs/Cooperative-Research-Centres-Projects-CRCP-Grants>

*Dr Martin Palmer is Enterprise Fellow, Food & Agribusiness, at The University of Melbourne* 



# Food science education: an undergraduate perspective

Words by Nick Williams

It took me five years after leaving high school to find my passion in food science, and it immediately got me wondering: what took so long?

Despite the vast opportunities in both academia and industry, food science is an under-represented niche among Australian universities. Out of the 43 universities across Australia, only 12 offer a bachelor's program in food science. This is not an immediate cause for concern, as undergraduate courses in chemistry, physics, and engineering can also lead to careers in food science. However, the distinct absence of food science representation also permeates other aspects of the university experience: electives, clubs and societies, and outreach and networking events.

During the first year in my Bachelor of Science (Food Science) program, my only interaction with food science was a single nutrition course. This is from a university offering a food science degree, so how could a student at any of the other 31 universities in Australia be introduced to food science?

Beyond the foundational knowledge they provide, first-year courses also introduce the wide variety of


topics available in both industry and academia. These early electives would give students - the engineers, chemists and physicists - an introduction to the variety of careers offered in food. While it may not be feasible to overhaul and revamp courses like this, the void could be filled with immersive information sessions and events to showcase career opportunities in the food industry.

Food science is also largely underrepresented in university clubs and societies with only a handful of dedicated food science clubs in Australian universities. This may be both a symptom and a cause of the scarcity of food science students - a kind of negative feedback loop of low representation. Clubs and societies play a vital part in professional development by providing both learning and networking opportunities. Instilling more of a physical presence on campuses - through clubs and societies as well as networking events - could be pivotal to inspiring the next generation of food scientists.

The AIFST's Young Professionals Special Interest Group has recently formed, with the aim of developing a student ambassador program across

Australian universities, and establishing a physical presence and point of contact on campuses. Working to establish this student ambassador program will make great strides toward bringing food science to the forefront of undergraduate minds. For a current undergraduate student in food science there are numerous opportunities for involvement - the AIFST's webinars, summer schools, and industry events to name a few. The issue, which the student ambassador program aims to help address, is extending the sphere of engagement.

The next wave of innovation in the food industry will not come from food science students alone - it will come from collaboration between scientists, engineers, business students, economists, and so on: all of whom were spurred on by a food industry event they attended in their first or second year of university.

*Nick Williams is an undergraduate student studying a Bachelor of Science (Food Science) at Curtin University, and a member of the AIFST's Young Professionals Special Interest Group* 

# Food and nutrition: a new senior subject for Queensland schools

Words by Melissa Fitzgerald

Senior schooling changed in Queensland in 2019 when the state adopted the Australian Tertiary Admission Rank (ATAR) along with a new syllabus. The first cohort of Queensland students with an ATAR will graduate in 2020.

The ATAR was first introduced in Australia in 2009 by Julia Gillard when she was the Federal Minister for Education. The ATAR score is used by universities and tertiary education programs as the qualification to enrol in a course. Queensland is the last state to transition to the ATAR, and now all states and territories are using the system.

The ATAR is a finer-grained rank order of students than the Overall Position (OP) which was used in Queensland until now. The ATAR is a number between 0.00 and 99.95, with increments of 0.05, whereas the OP consisted of 25 bands.

The ATAR follows the same principles as the OP, in relation to the performance of one student relative to the student body, but it differs from the OP in the assessment that is used to calculate the ATAR.

## Changes to assessment

The Queensland Curriculum Assessment Authority (QCAA) has developed a new system of assessment that is aligned with all the other states and with the ATAR requirements. The new Queensland Certificate of Education (QCE) system requires students to sit three internal assessments and one external assessment over years 11 and 12.

The internal assessments contribute

75 per cent towards a student's final subject result. All internal assessments are endorsed by QCAA for quality control and benchmarking and the assessments are marked using an instrument-specific marking guide (ISMG), that is provided in the syllabus. The external assessment is worth 25 per cent of the total mark.

The external assessment will be:

- Common to all schools
- Administered in the same conditions, at the same time on the same day
- Developed and marked by QCAA, according to a commonly applied marking scheme.

Implementation of an external assessment is new to the Queensland senior syllabus. The external assessment will be based on units 3 and 4 or only unit 4 of the syllabus, and will be held in term 4 of year 12.

## The new syllabus

In undertaking the change to assessment, the QCAA also undertook a significant revision of the senior syllabus. This revision led to the development of a new senior subject called *Food and Nutrition* that is housed within the Technologies portfolio. It is an authority subject that will contribute to the ATAR.

The syllabus for the new *Food and Nutrition* subject was written by a team of home economics teachers and academics in food science and technology from the University of Queensland. It provides up to four of the 20 required QCE credits and contributes to the student's final ATAR score.

Each new syllabus consists of four units. For *Food and Nutrition*, these are:

1. Food science of vitamins, minerals and protein
2. Food drivers and emerging trends
3. Food science of carbohydrates and fats
4. Food solution development for nutrition consumer markets.

The syllabus is organised in this way to enable composite classes of year 11 and 12 students to be taught concurrently. In practice, year 11 students in the classroom would be learning unit 1, while year 12 students in the same class would be simultaneously learning unit 3, with the same thing happening for units 2 and 4.

As students work through the units, they increase in complexity. Figure one shows the structure of the *Food and Nutrition* course and the information that is contained within each unit of learning.

In units 1 and 3, students will explore different macro and micro-nutrients in food, and how each component impacts functional properties, preservation, safety and nutritional value.

In unit 2, students will explore FSANZ, food legislation, and food safety, as well as different methods of sensory profiling, lexicon development and the association between sensory attributes and food components.

In unit 4, students will explore food formulations, reformulations to reach health claims and reformulations for different market cohorts such as gluten free or elite athlete. Finally,



students will develop and test a product for a particular nutrition consumer market, such as vegan, health-conscious, or the elderly. Each unit will also use Indigenous foods and food issues as examples and contexts.

The assessment items students will undertake will be both formative and summative. For units 1 and 2, assessment will be formative and for units 3 and 4, there will be three internal summative assessments and one external summative assessment.

The summative assessments will be an exam (20 per cent), two projects worth 25 per cent and 30 per cent, and a final external exam that will be worth 25 per cent. Three skill sets underpin each senior syllabus: literacy, numeracy and 21st century skills.

Students will develop food and nutrition literacy as they learn how to communicate ideas and solutions to different stakeholders. They will develop numeracy in food and nutrition as they use mathematical knowledge to interpret, calculate, measure and record data. The 21st century skills include critical thinking, communication, personal and social skills, creative thinking, collaboration, teamwork, and information and communication technology skills.

The units and topics students will study in *Food and Nutrition* will provide an excellent foundation to prepare them for courses in food science and technology at University. Placing *Food and Nutrition* in the Technology portfolio is likely to appeal to many students who are also doing other science subjects and planning to attend University.

In the past, at events to assist school students with making tertiary education choices, students often don't understand that graduate courses in food science and technology are demanding, multidisciplinary programs deeply lodged in science and engineering. Students often understand food science and technology simply as cooking.

Now, with *Food and Nutrition* being established as a new senior subject, it is hoped that students planning

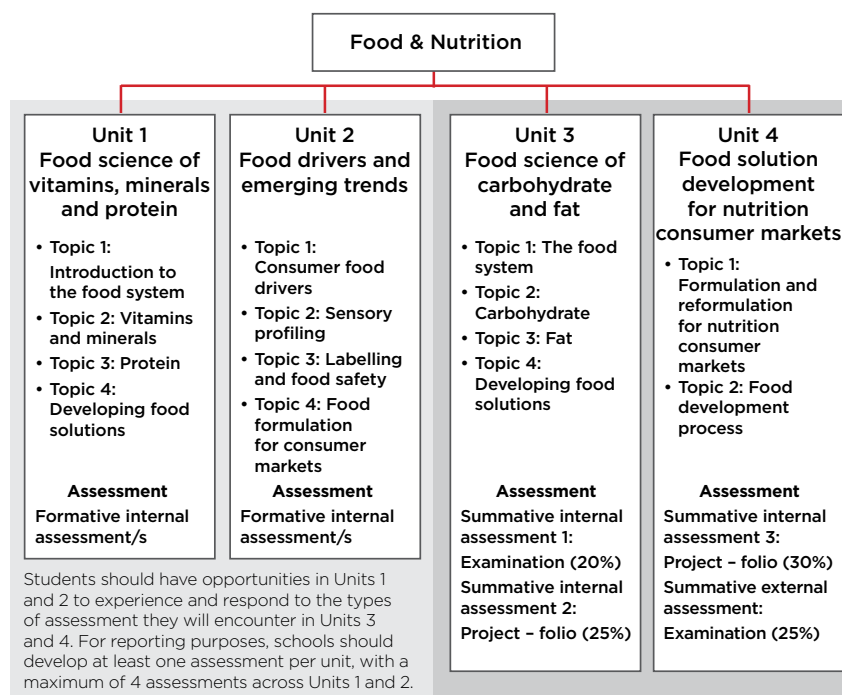


Figure 1. Structure of the Food and Nutrition senior course (QCAA syllabus p4).

to attend University will understand the scientific depth of food science and technology, leading to greater appreciation of the place of food science within a faculty of science or a faculty of engineering, and potentially leading to more enrolments.

### Familiarising schools with the new syllabus

Whenever a new syllabus is developed, input is requested from teachers who will teach it. Feedback was taken at least twice in the development of this new syllabus, and as much feedback as possible was incorporated into the syllabus.

One concern among teachers was that they need to transition from teaching Home Economics to teaching *Food and Nutrition*, which is a more scientific subject than Home Economics.

With any new syllabus, the QCAA nominates someone to take responsibility to communicate and demonstrate the syllabus to schools around the State. This lead person from the QCAA held a number of road shows around the state to communicate the syllabus and provide examples for assessments and hands-on work during the course.

In addition, the School of

Agriculture and Food Science at the University of Queensland led two professional development days in 2017 and 2018 where teachers came into University and conducted two of the classroom experiments developed for the syllabus, along with a demonstration of developing literacy and numeracy skills in food science in the analysis of the experiments and interpretation of results.

By teaching *Food and Nutrition* at senior schools as an authority subject that contributes to the ATAR, it is expected that students planning to attend University will be more likely to select this as one of their subjects.

It is hoped these curriculum changes will lead to more students considering tertiary studies in food, and more students who appreciate the complexity of food science and nutrition. We hope, in turn, this will lead to an increasing number of high quality graduates who can imagine their future within the Australian food industry.

*Melissa Fitzgerald is Chair in Food Science and Technology in the School of Agriculture and Food Sciences at the University of Queensland.* ⓘ



# Information asymmetry and the age of misconception

*Words by Chris Preston*

Put simply, information asymmetry is where one party to a transaction knows more than the other. Where the superior information is relevant to the transaction, it creates a power imbalance that favours the more knowledgeable party.

In the real world, information asymmetry is present in virtually every transaction we make - sometimes we are the more knowledgeable party, oftentimes the less, but we can recognise that classical economic theory predicated on perfect, or at best equal, knowledge lacks street cred. Investigating information asymmetry in real world markets can win you a Nobel prize (Akerlof, Spence & Stiglitz, 2001).

For the food industry, information asymmetry is most present in the

relationship between the consumer and the manufacturer. When buying food, the vast majority of consumers are at a significant informational disadvantage. The manufacturer, or marketer, will have significantly more knowledge about the product to which the consumer has little or no access, and little or no means of engaging with the manufacturer prior to purchase.

In these circumstances, consumers have little choice but to rely on the label representations made by the company about its products. This asymmetry lies at the heart of, and is the rationale for, the consumer law prohibitions against conduct that is misleading or deceptive, and also the mandatory labelling laws that seek to redress the information gap between company and consumer.

Modern consumers also enjoy access to an astounding amount of data from many sources, of which the data provided by a company is but one. It competes with the memes and opinions of friends, influencers and indeed anyone with a social media megaphone. However, data is not the same as information.

Data needs a conceptual framework to facilitate analysis before it can deliver information. Trust in the source is one such framework, and well might we ponder how trustworthy we are in the eyes of consumers. Certainly, when it comes to labelling, trust is hard to win and easy to lose, especially where information asymmetry leads to trust being placed in the wrong places, creating a celebrity culture of misconception.

One problem caused by information asymmetry is adverse selection. Adverse selection occurs when a party to a transaction, for example a consumer, makes a choice that is objectively sub-optimal, or even harmful, on the basis of imperfect information available to them. This is a key source of market failure. When consumers enter transactions based on misconceptions, driven from whatever source, both they as individuals and the Australian economy as a whole suffer - never very much in any one transaction, but cumulatively the loss can be significant.

It is unrealistic to suggest we should educate the entire Australian population to the point of being able to assess food safety risks, validate the science underlying health claims or understand the complexity of

whole-of-diet nutrition, not least because food consumption is not an entirely rational experience. However, as food scientists, we can actively take some actions, and avoid others.

First and foremost, we can implement strong principles of evidence-based labelling in our companies. We can ensure our product claims and representations are accurate and properly communicated to the target audience. Many companies already have such policies.

Just as importantly, we can bring food science to the table when there is an attempt to take advantage of the information asymmetry between company and consumer. This is more common than you might think. Food science assures us of the safety of food additives, and yet products are marketed as containing 'no hidden nasties'.

Claims of no preservatives and no artificial colours or flavours, while likely to be true, nonetheless play on the information asymmetry and fears of the consumer and lead to adverse selection. We should not be so naive as to believe we will win the case against the marketing of such claims, but it would be nice to force marketers pushing them to recognise that they are exploiting asymmetry and doing economic damage.

So, the next time you hear someone bemoaning the lack of consumer understanding of food issues and the need for education, perhaps pause and take stock as to whether you are part of the problem or can be part of the solution.

*Chris Preston is principal legal adviser, Australia, at ComplyANZ.* ⓘ

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# Connections between good nutrition and education outcomes for children

Words by Carla Bourgy and Dr Roslyn Giglia



The UNICEF State of the World's Children Report has been published annually since 1980, and in the most recent report, food and children's growth was the focus.<sup>1</sup>

According to UNICEF's Executive Director, Henrietta Fore: "Good nutrition paves the way for a fair chance in life". In Australia, we can work to provide all our children with a fair chance through access to good nutrition, so they too can have a fair go at becoming great Australians.

A child's academic achievement influences their occupational

opportunities, consequently contributing to their future health, wellbeing and success.

The significance of academic achievement has caught the interest of researchers who seek to investigate what influences a child's academic achievement, and how to improve it.

One determinant for consideration is childhood nutrition. It is undisputed that good nutrition is essential for optimal brain growth and cognitive development. But what is also of interest is how good nutrition practices and habits throughout

childhood actively contribute to the academic success of a child.

The concept of the first 1000 days<sup>2</sup> outlines the importance of the period from the moment of conception until a child's second birthday, in affecting their ability to attain optimal academic outcomes. Ensuring that both mother and child are well nourished throughout pregnancy will ensure a trajectory for growth and developmental success.

Once born and until six months of age, breastmilk alone delivers the complete and proportionate



nutrition needed for a baby, and several studies have shown that breastfed babies have higher IQs later in life.<sup>3</sup> The foundations of good nutrition developed from infancy are important and shouldn't stop there, however. Choosing nutritious foods and encouraging healthy dietary behaviours must follow into childhood.

In recent times, there has been research into dietary patterns that are associated with better academic achievement in children. In the first systematic review of its kind, researchers *Burrows et al*<sup>4</sup> set out

to establish what dietary patterns in school-aged children contributed to good academic outcomes. Studies from across the globe were included, and all appeared to have identifiable dietary patterns in common. The most prominent of these was having breakfast. Included in the review were 12 studies that showed eating breakfast was significantly associated with better academic outcomes.<sup>4</sup>

Breakfast is one of the most common meals discussed in popular media, and eating breakfast has been established to be of high value to

children. This dietary habit continues to reap rewards into adulthood as research has shown that adults who eat breakfast have better daily nutrient intakes overall than breakfast skippers.<sup>5</sup>

Children particularly benefit from breakfast because they have a higher rate of brain glucose metabolism compared to adults, and coupled with the tendency to sleep longer, means that their glycogen stores deplete after a night's rest.<sup>6</sup> Breakfast helps children replenish these energy stores and stimulate cognitive function



making them ready to start the day for learning and activity.<sup>6</sup> Essentially they are 'breaking' the overnight 'fast' - breakfast.

The reasons why eating breakfast helps with academic success could be due to how breakfast influences the behaviours needed for academic success. For example, an important attribute needed for academic achievement is being able to have on-task concentration, which means not getting distracted and being able to focus on learning during any given activity.

A school breakfast program directed by Foodbank WA, covering nearly 500 West Australian schools, recently evaluated the impact that breakfast had on the in-class behaviour of children.<sup>7</sup> Reflections from teachers, coordinators and students consistently showed that student's readiness for learning, on-task concentration, attendance, punctuality, productivity in class and behaviour all improved and contributed to a calmer classroom mood.<sup>7</sup> The positive classroom mood had flow-on effects that extended to the wider school environment.

Teachers noticed that there was an improvement in the out-of-classroom environment too.<sup>7</sup>

When students are able to engage with the behaviours required for academic achievement, it walks farther than just the classroom door and extends to the culture of the wider community. If simply eating breakfast can allow students to engage with behaviours that boost their potential for success, then the saying 'breakfast is the most important meal of the day' must indeed have some truth.

Another dietary pattern investigated in the systematic review by *Burrows et al*<sup>4</sup> was the effect of energy dense, nutrient poor foods, commonly known as junk food or fast food. The review found that children with lower intakes of fast food and sugar sweetened beverages, i.e. soft drinks, had better academic achievement.<sup>4</sup>

Too much fast food is detrimental to health, increases the rate of obesity and non-communicable diseases, and is harmful to academic achievement. For decades, the targeted message has been to eat high energy and high

sugar foods in moderation, especially because these foods displace and replace other healthy, nutritious foods.

In stark contrast, fruit, vegetable and fish consumption was significantly associated with better academic achievement.<sup>4</sup> It is important to note that there is no consensus on how much fast food, fruits, vegetables and fish contribute to this effect, as all studies collected and reported information differently.<sup>4</sup>

Despite not having a clear idea of how much of these foods are needed (or not needed), the discussed dietary patterns linked to better academic achievement go hand-in-hand with already established Australian government dietary guidelines.<sup>8</sup> The encouragement to begin your day with breakfast, fill your meals with fruits, vegetables and proteins and limit junk food intake is not new information.

A strong evidence base has supported these recommendations for years.<sup>8</sup> Therefore, although findings in this review by *Burrows et al* are interesting, it is unsurprising that the dietary behaviours associated with good health are also associated with

better academic achievement.

What is important to consider in this discussion are the many confounding factors that also influence a child's academic achievement, such as parental education, family characteristics and socio-economic status (SES).<sup>9</sup> Inseparable, these same factors influence the dietary choices and behaviours of families, for example there is a distinct association between low SES households and unhealthy dietary behaviours.<sup>10</sup>


To give all children the best chance at academic achievement, we must continue to promote good nutrition and dietary behaviours at individual, interpersonal, organisational and environmental levels. Current initiatives such as school breakfast programs support children that may not have access to food at home and relieve pressure from caregivers who are time or money poor.

Nutrition education, either individual or at the class level, teach children about good nutrition and provide the opportunity to develop skills for cooking at home. Government supported programs that promote beneficial dietary behaviours and are evaluated for their effectiveness, for example Stephanie Alexander Kitchen Garden, Food Bank WA *Food Sensations*<sup>®</sup> for Schools Program, or the Go for 2&5 campaign (2006-2012) should be strengthened and supported at a national policy level.

By continuing to intensify and expand these avenues of delivery, we enable children to have access to, and knowledge of, healthy, nutritious foods, setting them up for academic achievement and life-long prosperity.

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Ms Carla Bourgy, MDIET, BSc (Nutrition), APD is a Public Health Nutritionist for Foodbank Western Australia and Dr Roslyn Giglia PhD, MPH, GradDipDiet BAppSc (Nutrition & Food Science), AdvAPD, is the Nutrition & Food Security Manager, Foodbank Western Australia. 

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# Allergen management resources

Words by Debbie Hawkes

Incidents involving food allergens are an increasing international phenomenon and the leading cause of food recalls in Australia and New Zealand. In 2018, undeclared allergens made up 46 per cent of Australian recalls and, at the time of writing, 53 per cent of New Zealand recalls in 2019 were from undeclared allergens. Most of these recalls are due to packaging errors or supplier verification issues.

## Navigate the science VITAL® Program and VITAL Scientific Expert Panel

The Allergen Bureau's VITAL® (Voluntary Incidental Trace Allergen Labelling) Program is a standardised allergen risk assessment process for the food industry. VITAL uses a consistent science-based approach, with scientifically derived allergen reference doses forming the basis

of deciding the appropriateness of precautionary allergen labelling in foods that contain allergen food residues in the form of cross contact.

Scientific evidence has shown there are levels of allergenic food residues that are small enough not to trigger an allergic reaction in most individuals with a food allergy under normal circumstances. Recognising a need for these levels to be identified through sound and robust science, the Allergen Bureau invited international scientists specialising in allergen management, food allergy and risk assessment to form the VITAL Scientific Expert Panel (VSEP).

The objective of the VSEP is to review the underpinning science around food allergen thresholds and reference doses. The recommendations from the VSEP form the scientific framework for the VITAL Program.<sup>2</sup>

## VSEP 2019 reference doses - VITAL 2.0 to VITAL 3.0

At FAMS2019, members of the VSEP, Professor Steve Taylor [Food Allergy Research & Resource Program (FARRP), University of Nebraska and VSEP Chair] and Dr Ben Remington [Netherlands Organisation for Applied Scientific Research (TNO)], presented new research on allergen threshold modelling and the resulting updated set of food allergen reference doses. A summary description of the methodology applied in the determination of the updated reference doses is provided in the Summary of the 2019 VITAL Scientific Expert Panel Recommendations available on the Allergen Bureau website.<sup>3</sup>

The previous reference dose recommendations (VITAL 2.0) used three discrete models (Weibull, Log Logistic and Log Normal) and eliciting

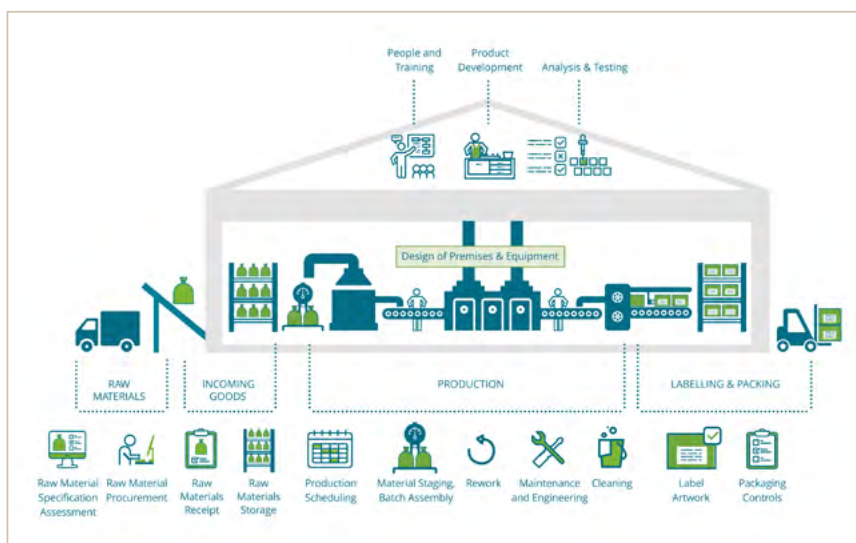


doses (EDp) were identified by 'expert judgement' of the best fit from the three models in the relevant low dose section of the model.

The Panel advised that ongoing collaboration between FARRP, TNO and Dr Matthew Wheeler, US CDC [National Institute for Occupational Safety and Health (NIOSH)] to improve the allergen dose distribution modelling has resulted in the development of a new 'stacked model averaging' program.<sup>4</sup> This program incorporates five different statistical models (Weibull, Log Logistic, Log Normal, Log Double Exponential, General Pareto) and produces a single 'averaged' distribution.

The stacked model averaging program produces a single curve for each allergen from which eliciting doses may be derived. The VSEP identified the ED01 and ED05 for each allergen. The Panel considered the more conservative estimate to be appropriate after fitting the data to both discrete and cumulative dosing schemes.<sup>5</sup> The Panel considered that ED01 better met the requirements of the Allergen Bureau which included: minimising the percentage of the allergic population at risk from cross contact allergens in unlabelled products; increasing the likelihood of global acceptance of VITAL; and a level of risk no greater than VITAL 2.0. Additionally, ED05 values are also provided for information (Table 1).

Sufficient data were available for egg, hazelnut, lupin, milk, mustard, peanut, sesame, shrimp, soy, wheat, cashew, celery, fish and walnut.



*The interactive Allergen Risk Review website is based around a schematic factory map to show allergen impacts and provides reassurance for risk review decisions and assumptions.*

There was a significant increase in the number of individuals who had undergone challenge studies for most allergens and also, therefore, the number of data points available for dose distribution modelling. As with the 2011 recommendations, all the data from adults were derived from double blind placebo controlled food challenges,<sup>6</sup> whereas blinding was not considered absolutely necessary in the case of data from infants and very young children on the basis of clinical opinion.

The following Allergen Bureau activities have occurred to facilitate the transition from VITAL 2.0 to the new science of VITAL 3.0:

- Update the food industry guide to allergen management and labelling for Australia and New Zealand

- Update the food industry guide to the VITAL Program to version 3.0
- Enhance VITAL Online functionality to assist change management (update all recipes, summary of recipes by allergen status, recipe change history)
- Update the VITAL training package to include VITAL 3.0

The Allergen Bureau encourages VITAL users to be aware of the reference dose changes, and review the impact these changes may have on risk assessments and labelling. It is important to emphasise that the process of doing an overall risk review and a VITAL risk assessment does not change. The basis of the VITAL Program continues to be good risk review and good manufacturing processes (GMP).

## Who is the Allergen Bureau?

Established in 2005, the Allergen Bureau is a membership-based organisation that works on behalf of the food industry to address many of the causes of allergen related food recalls. The Allergen Bureau operates primarily through promotion of best practice allergen risk assessment and management, to help food manufacturers provide allergen sensitive consumers with relevant, consistent and easy to understand food allergen information.

The Allergen Bureau operates through a board of directors who volunteer their time, with the support of their companies, to govern the organisation and actively manage and contribute to projects. The expertise of scientific and technical consultants and a funded secretariat provides the support network to deliver Allergen Bureau industry initiatives. Current membership is comprised of one global full Member, 34 full members, 37 associate members and 48 individual members - a total of 120 members.

The Allergen Bureau's vision of being a globally recognised organisation is supported by Allergen Bureau website visitation data, showing that more than 50 per cent of users and sessions on the Allergen Bureau website come from outside of Australasia.

### Manage the risk

While the Allergen Bureau helps the food industry navigate the science of food allergens, by organising events such as FAMS2019 and collaborating with international researchers such as the VSEP, we also work to provide information and resources that help industry better manage the risk from allergens, particularly in support of the VITAL Program.

- The VITAL Program is supported by a broad framework of Allergen Bureau initiatives including:
- A free email and phone helpline service - call +61 437 918 959 or email info@allergenbureau.net
- Monthly Allergen Bureau eNews - circulated to more than 8000 people, covering the latest industry news and information
- VITAL training providers - 19 endorsed training providers from many regions globally
- VITAL Online (the user-friendly, web-based VITAL calculator) to record the VITAL risk assessment, including calculation of action levels incorporating the VSEP recommended reference doses, leading to a finished product labelling outcome
- Collaboration with, and submissions to, such key agencies such as FSANZ and the Codex Alimentarius Commission
- Working Groups: risk review; risk communication (labelling); VITAL certification; cross contact risk review anomalies; and agricultural allergen cross contact

The Allergen Bureau working groups play a significant role in helping industry manage food allergen risks. They provide a collaborative approach to addressing allergen issues at the pre-competitive stage, with each group helping to take forward key areas identified for development.

#### Allergen risk review website

The interactive allergen risk review website is designed to guide the user through conducting a best practice allergen risk review. It is expandable to include the entire supply chain, from primary production to finished

**Table 1 – VSEP 2019 Recommended Reference Doses (mg protein)**

Allergen	No. of individuals	VITAL 2.0 Ref Dose (mg protein)	2019 VSEP Ref Dose (mg protein) [ED0 <sub>1</sub> ] = VITAL 3.0	Change	2019 VSEP (mg protein) [ED0 <sub>1</sub> ]
Egg	431	0.03	<b>0.2</b>	↑	2.3
Hazelnut	411	0.1	<b>0.1</b>	✓	3.5
Lupin	25	4.0	<b>2.6</b>	↓	15.3
Milk	450	0.1	<b>0.2</b>	↑	2.4
Mustard	33	0.05	<b>0.05</b>	✓	0.4
Peanut	1306	0.2	<b>0.2</b>	✓	2.1
Sesame	40	0.2	<b>0.1</b>	↓	2.7
Shrimp	75	10.0	<b>25</b>	↑	280
Soy (milk + flour)	87	1.0 (soy flour)	<b>0.5</b>	↓	10.0
Wheat	99	1.0	<b>0.7</b>	↓	6.1
Cashew	245		<b>0.05</b>	+	0.8
Celery	82		<b>0.05</b>	+	1.3
Fish	82		<b>1.3</b>	+	12.1
Walnut	74		<b>0.03</b>	+	0.8

↑ Reference Dose increased, ✓ Reference Dose unchanged, ↓ Reference Dose decreased, + New Reference Dose  
Source: Summary of the 2019 VITAL Scientific Expert Panel

product and it is easy to use, with the ability to focus on specific areas of concern. This website is freely available, linked from the Allergen Bureau website, and is a very visual tool based around a schematic factory map (Figure 1) to show allergen impacts and provides reassurance for risk review decisions and assumptions.

#### Allergen risk review anomalies

The Allergen Bureau has been collaborating with the Ai Group, AFGC, ANZ jurisdictions, Allergy NZ, and Allergy & Anaphylaxis Australia to determine consensus on the issue of allergen risk review anomalies. An allergen risk review anomaly is defined as allergens known to be present at significant levels but not formulated as an ingredient, and therefore inappropriate to label as “**May be present: allergen x**”.

This scenario can occur when every attempt has been made to effectively eliminate the allergen, but the process or environment cannot be altered or impacted through GMP (such as milk or dairy in dark chocolate blended in the same conch). A set of key guiding principles and a decision tree have been developed to help affected

companies. This industry guidance has been published to ensure appropriate labelling for the allergic consumer, which may involve declaring the allergenic substance, such as milk for example, as the last ingredient. It is important to note that the decision tree must not be used as a substitute for appropriate risk review and GMP.

#### The ‘VITAL Standard’ for certification

Allergic consumers do not currently have information to confirm whether a product has undergone a robust VITAL risk assessment and therefore whether they can trust the allergen and precautionary allergen labelling. The VITAL Standard and certification process has been developed to address concern amongst allergy consumer groups by providing external verification of specific products.

The VITAL Standard has been written in compliance with ISO 17065 and has been designed as an extra module for sites certified to a GFSI-recognised food safety management scheme with HACCP based allergen management programs. VITAL certification is site and product specific and will include an optional

on-pack VITAL mark next to the ingredient list as an endorsement of the integrity of the allergen labelling. All VITAL Standard certified products will be registered by the Allergen Bureau and listed on their website.

### **Agricultural allergen cross contact**

In response to detections of allergens in agricultural crops (such as peanut in garlic and lupin in wheat), a working group has been formed to identify and communicate the challenges. Work is in progress to update the Allergen Bureau's Unexpected Allergens in Food publication, develop an agricultural cross contact issue flow chart, define sampling and testing guidance, and establish better cross sectoral working relationships. Ultimately, this working group aims to publish a Food Industry Guide to Agricultural Allergen Cross Contact Management.

The Allergen Bureau will continue

to communicate about food allergen science and risk management via our website and eNews, and at conferences such as FAMS. We will maintain collaboration with key stakeholders via our working groups, and we will continue to invest in resources that support best practice allergen management such as the VITAL Program.

And while we look toward increasing the proportion of users of the VITAL Program outside of Australia and New Zealand, the Allergen Bureau will always work to maintain and improve our core commitment of informing the local ANZ food industry.


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*Debbie Hawkes, FNZIFST, is Director of The Allergen Bureau and General Manager of Hawkins Watts (Operations and Quality, ANZ).*

*This article is based on Debbie Hawkes' presentation at the NZIFST Conference, Good Food 4, in July 2019, and printed in the October/November 2019 issue of Food New Zealand* 

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# Quality management top tips

Words by Marc Barnes

Today, the adoption of quality management is a strategic decision that can help an organisation to improve its overall performance and provide a sound basis for sustainable development initiatives. Put simply, quality management is about making sure that whatever you do, you do it well every time.

We've put together some top tips to help your business understand how the seven principles of quality management apply to you. These principles are based on the quality management principles from ISO 9000:2015.

**1. Customer focus – the primary focus of quality management is to meet customer requirements and strive to exceed customer expectations.**

This principle may seem obvious, but actually it has an important implication: quality itself is not a fixed concept, but is defined by customer expectations. At BSI we are increasingly seeing that customer expectations around the world are changing, many now want ethical and sustainable products, for instance. So, as a business you need to find out what your customers really want by talking to them. Ask them if they are satisfied with what you are providing, and if you could be doing anything better for them.

**2. Leadership – leaders at all levels establish unity of purpose and direction and create conditions in which people are engaged in achieving the organisation's quality objectives.**

You're the boss, it's your business, you decide where you're going, how you'll get there and who's going with you. If you work with other people

make sure they know what you want, what you want to achieve and by when.

**3. Engagement of people – competent, empowered and engaged people at all levels throughout the organisation are essential to enhance the organization's capability to create and deliver value.**

Value what people are good at, and work to their strengths. If skill, knowledge or experience is needed, make sure the person doing the job has it, or hire someone who does. If that's not an option, ensure the relevant training is available.

**4. Process approach – consistent and predictable results are achieved more effectively and efficiently when activities are understood and managed as interrelated processes that function as a coherent system.**

Don't muddle along or reinvent the wheel. Look at everything that needs to be done, work out how the different parts fit together and make a start-to-finish plan so that everything works. If you're baking bread, it's not enough to just have all the ingredients. You follow a recipe. You use the right equipment. You follow precise timings. Business is just the same.

**5. Improvement – successful organisations have an on-going focus on improvement.**

Quality management talks a lot about continual improvement. This can make a business owner nervous. It makes you think that you've got to grow your company year-on-year. Don't panic, that's not what quality management is asking you to do. Continual improvement means 'don't stop looking', it doesn't mean 'keep

taking action'. Only make changes that work for your ambitions. Don't do it for the sake of it.

**6. Evidence-based decision making – decisions based on the analysis and evaluation of data and information are more likely to produce desired results.**

How do you know if things are going well or going badly? Do you just feel it in your bones or do you have evidence to back those feelings up? Once in a while, you need to stand back from the day-to-day and take a long hard look at your business from every angle. Get a big picture view of those things you've been measuring and do some cross-checking. What does the evidence tell you?

**7. Relationship management – for sustained success, organisations manage their relationships with relevant interested parties, such as providers.**

Talk to your customers. If you get a complaint, talk to them. If you get praise, talk to them. Find out what really matters, don't assume. If you're seeing a steady - or sudden - increase in trade, talk to your suppliers. Can they keep up with demand? If they can, is everything up to scratch or are standards slipping? Talk it through before it becomes a problem. If it already is a problem, arrange a meeting and listen to what they have to say. Then work out a new agreement. Email it to each other and keep each other in the loop about changes or concerns.

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# Educating the future food scientist and technologist

Words by Deon Mahoney

According to the United Nations, the world's population is projected to reach 8.5 billion by 2030.<sup>1</sup> This will require food exporting countries such as Australia to produce ever increasing quantities of food to support global food demand and ensure food security. Most analysts consider that Australia has a tremendous opportunity to grow its agricultural sector, especially in production and further processing of agricultural commodities, and food supply for both our domestic and global markets.

In 2018, the National Farmers' Federation laid down a bold vision for Australian agriculture, proposing a target value of \$100 billion in farm gate output by 2030. In August 2019, the Minister for Agriculture, realising this aspiration, asked the Standing Committee on Agriculture and Water Resources to inquire into the opportunities and impediments to the primary production sectors. The target set for the agribusiness sector of the economy illustrates Australia's competitive advantage in agricultural production and focuses on the sector producing what the world increasingly needs.

## Factors impacting agribusiness in Australia

Various factors will impact Australia's ability to grow agricultural production and concomitantly expand our food processing capacity. This includes increased access to suitable land, water and irrigation, technology, investment in the value chain, and the availability of a skilled and competent workforce.

A competent and skilled workforce is a key resource. Are our universities and colleges able to produce the quantum of graduates with the knowledge and capabilities required in this rapidly changing world?

In agriculture there is already an identified shortfall in the number of graduates. A select study published by the Australian Farm Institute in 2018 identified an abundance of opportunities for graduates in agriculture and highlighted that the shortfall in availability of graduates was a threat to the sustainability of primary production in Australia.<sup>2</sup>

Australian agriculture is also still very much focused on producing bulk commodities for global markets. There are real opportunities to create and manufacture highly segregated

and high value-added products for niche markets. However, any optimism surrounding the growth of agribusiness will need to be matched by advances in, and expansion of, our food processing capability and capacity. This requires personnel with advanced skills and vision, and while we enjoy high education levels and an innovative culture, the question remains, can we do it?

## Higher education in transition

Investment in education is the key to having a competent workforce, capable of ensuring Australia remains relevant in the third decade of the twenty-first century. Higher education continues to play a vital role in Australian society, making significant contributions socially, economically and intellectually.<sup>3</sup>

However, there are significant issues facing this sector. Higher education in Australia is under pressure due to budget cuts, high staff turnover, failure to innovate, market saturation in specific disciplines, changes in delivery mechanisms and the changing job market.

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## Higher Education Statistics in Australia

Persons in Australia aged between 25-34 with a bachelor's degree (or higher)	39.7%
Australian and international student enrolments	1.4 million (2017)
Higher education graduates	340,000 (2017)
Education of international students in Australia	3 <sup>rd</sup> largest export (behind iron ore and coal)

skills and knowledge. The education provider needs to become more consumer driven. For example, innovative digital technologies and emerging business models are changing the nature of the food industry and supply chains, with these new technologies impacting the value of existing products and services offered in the industry. Graduates need to be well-informed of contemporary trends and processes and suitably equipped to support the food industry to address the challenges ahead.

### Skills required in agribusiness

Higher educational programs in agriculture, food science and food technology have experienced significant change and have continued to evolve over the past thirty years. The number of institutions presenting food science and technology degrees and food science related programs has increased significantly in this time.

Currently, there are around 22 institutions delivering programs related to food science and technology, ranging from certificate, diploma and undergraduate degree level to postgraduate degree level. But are enough students that are interested in careers in food science and technology being secured, to remain viable? With constant budgetary pressure on these institutions, failure to attract enrolments in programs can result in programs being either inadequately resourced or even axed.

The educational providers also need to continually overhaul their programs to reflect the skills, challenges, and multi-disciplinary competencies needed to support agribusiness and to ensure graduates retain their relevance and currency. Attracting students to enrol in these programs continues to

be a challenge.

Do we adequately promote the complex but exciting and challenging career in agriculture or food science? Are existing programs sufficiently interesting and innovative to attract students from high school into university programs in food science? Regrettably, statistics on enrolments and performance are surprisingly difficult to find and interpret.<sup>4</sup> However, one statistic is clear - enrolment of overseas students is booming and their fees are the single largest source of university revenue.

A diverse range of skills are required for a career in agribusiness or food science. These include inputs from disciplines such as biology (microbiology, botany, zoology and entomology), agronomy, plant pathology, water science, animal husbandry, veterinary science, food science and technology, quality assurance, engineering, laboratory methods, fermentation science, molecular biology, nutrition, and so on. The capacity to cover all these disciplines in a single faculty or department is challenging and requires academics who can cover cross-disciplines and create alliances with other facilities.

The food scientist of the future will need to address drivers such as increasing demand for higher value foods, increasing ethical considerations regarding the origin of our foods and sustainable production, and increasing demand for specific food attributes (health benefits along with safety, security and freshness). Different sectors of the Australian food industry will face different challenges and different drivers for change.

In addition to graduates that will operate and manage our food processing facilities, ensure product

safety and suitability, and create innovative new products, there is a need for researchers that will undertake the fundamental research that will underpin expanding food production and its utilisation.

### Investment in research and development

A wide range of entities fund research and development in Australia. In addition to the benefits that accrue from undertaking strategic research, there is the training of our next generation of researchers whose outputs ensure our food industry is both innovative and competitive.

Competitively funded collaborative research centres such as the Australian Research Council (ARC) Centres of Excellence and Cooperative Research Centres (CRC) are a key feature on the Australian landscape as they bring together experts from research organisations, universities, industries and government and produce world-leading research with real-world benefits. The outcomes of their work result in productivity improvements, drive job creation and lead to benefits for Australian society.

In 2019, the ARC announced the establishment of the Centre of Excellence for Plant Success in Nature and Agriculture, based at The University of Queensland. This Centre will investigate the adaptive strategies underpinning productivity and resilience in a range of diverse plants. Improving knowledge of the genetic and physiological traits of plants will provide breeders with predictive capability to improve strain quality. It will also support predictions on plant varieties suited to particular environments and enable farmers to choose which plants to grow, and in what areas for each season for the best yield. The results will have

specific application to issues around food security and climate change.

The Future Food Systems CRC was also established in 2019. It will support participants in optimising the productivity of regional and peri-urban food systems, taking new products from prototype to market and implementing rapid, provenance-protected supply chains from farm to consumer. The CRC initiated by the NSW Farmers Association, UNSW and Food Innovation Australia Ltd and working with its research partners, will cover the entire food supply chain, incorporating innovations in protected cropping, advanced manufacturing, smart logistics and food science, to underpin high-value industries in agri-food hubs. The CRC will assist in graduating 60 PhD students, helping to train a new generation of scientists.

Other CRCs include the Fight Food Waste CRC which aims to improve the competitiveness, productivity and sustainability of the food industry, and

the Food Agility CRC which is leading a digital revolution in food production and supply, supporting the agri-food sector to be more globally competitive and sustainable.

### Summary

Our future diet may very well include less dairy, seafood and meat. Instead we will have customised diets comprising a range of hitherto underutilised or novel ingredients and created using new technologies.

Critical to us expanding Australian food production and utilisation is an educated and dynamic cohort of food scientists and technologists. Graduates and their skills are one of the most important success factors for the Australian food industry as it approaches the future.

We need graduates with diverse skills and determination in order to support the transformation of agricultural production into value-added products that meet

contemporary market needs. Our higher education institutions need to continue to evolve, creating courses which meet these needs, and we must continue to invest in competitively funded collaborative research centres.

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*Deon Mahoney is head of Food Safety for the Produce Marketing Association Australia and New Zealand (PMA A-NZ), and has previously worked for the World Health Organisation, the Food and Agriculture Organisation and FSA NZ.*



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# Raising the bar for food packaging technologists

Words by Nerida Kelton



As the peak professional body for packaging education and training in Australasia, it is paramount that the Australian Institute of Packaging (AIP) provides internationally recognised professional designations to enhance the profession across the globe.

Such a designation is the Certified Packaging Professional (CPP)®, which is a registered trademark of the Institute of Packaging Professionals (IoPP) in the United States. Since 1972, the IoPP has awarded over 2000 qualified applicants the designation 'Certified Packaging Professional (CPP)' which is now recognised globally as an indication of excellence as a packaging professional.

Candidates achieve the CPP designation by demonstrating significant industry expertise and experience, measured through a flexible applicant testing process and a detailed Certified Professional Development (CPD) program.

Attaining the CPP recognises a commitment to excellence in the packaging profession and the credential demonstrates a packaging practitioner possesses packaging knowledge, experience and skills to the degree that they deserve recognition as a true packaging professional. CPPs are in demand as speakers and as leaders on packaging teams.

Recognising the importance of the CPP designation, the AIP approached the IoPP to become the first association globally to roll out

the program outside the US. The Australasian region now has more than 25 CPPs, with enrolments coming in every week from Australia, New Zealand and Asia. All AIP educational and training activities now attain CPD points towards the CPP designation which allows active members the opportunity to accrue points by learning, networking and attending packaging-related educational programs.

Through the guidance of the AIP, this model has now been replicated through the World Packaging Organisation (WPO). All WPO member associations are being encouraged to offer the CPP program in their country, elevate the profession globally and ensure packaging technologists and designers are recognised for their skills and expertise.

WPO member countries currently in the process of the rollout include Nigeria, Brazil, South Africa and Singapore with many others to follow shortly. The CPP designation is now internationally recognised by the IoPP, the AIP and the WPO.


By encouraging other countries to roll out the CPP program, the aim is to see packaging technology and design become more globally recognised as a profession, which in turn will encourage more people to attain greater packaging skills and knowledge and develop long-term careers in packaging. The CPP designation should also help companies recognise and employ

highly skilled packaging professionals through international transfers and exchange programs.

Attaining the CPP designation is an excellent investment in your professional development as it allows organisations to seek out and hire the right professional based on verified knowledge, skills and industry contributions. In an ideal world, all companies hiring packaging professionals would ensure the CPP designation is part of the hiring and promotion processes.

The most recent IoPP salary survey revealed those with CPP accreditation earn between seven and 10 per cent more than their non-certified co-workers. Using the CPP program to assess and evaluate one's professional competency validates you as internationally proficient as a packaging professional - a cut above your peers without the CPP.

Next time you meet someone with CPP after their name I would ask that you please congratulate them, as the designation is a significant achievement that deserves recognition by the business they work in and their packaging peers. Would you like to join packaging experts from around the world with the Industry's leading professional designation? Ask the AIP how.

*Nerida Kelton MAIP is executive director of the Australian Institute of Packaging and ANZ Board Member of the World Packaging Organisation.* 



## Food technologist – A career which ticks all the boxes

Words by Geoffrey Annison, PhD

Many years ago I was accepted into the Faculty of Applied Science at the University of New South Wales. At that time there were several schools in the faculty including Wool and Pastoral Science, Chemical Engineering, Textile Technology and Food Technology.

I had no idea which school to join so I asked my mother. Her advice was: “Food technology, of course. People always have to eat”. That turned out to be sound advice and I’ve enjoyed a career in and around the food industry for all my working life.

Many years later, when the Australian Food and Grocery Council (AFGC) was considering how to increase the number of young people choosing food science and technology courses, I attended a meeting convened by AIFST to discuss the same issue. Also attending was the vice-chancellor from one of our universities who was of the strong view that the best way to attract the smartest students into a discipline was to target them when they are coming to the end of their second year of university. At this time students are

beginning to focus on what to do after university, and what their career options might be.

Apparently, before then they are too busy having a good time to worry about such mundane matters as their future. Applying this approach to attracting students into food science, the vice-chancellor recommended structuring food technology degrees which share foundation courses with other science disciplines in first and second year and then, offering inducements to attract students into food science and technology electives

with targeted scholarship programs for their third and fourth year.

This strategy was one element of a number of initiatives later developed by the AFGC in partnership with the University of Queensland from 2012 which successfully increased the number of students entering and graduating with food technology degrees.

Another viewpoint is that young people should be targeted early by promoting the teaching of food science and technology in secondary schools in the hope that they'll then go on and seek out food technology courses at university. I'm supportive of this approach too, but it requires considerably more resources including the development and maintenance of a curriculum and not all secondary schools would offer food technology courses in years 11 and 12.

A broader question is the type of person we may wish to attract into becoming a professional food technologist. The education pages of the national dailies frequently have the debate about the value, or otherwise, of graduates from specialist vocational courses versus more generalist courses. With the focus on critical thinking and problem solving as key attributes of graduates attractive to employers, the future roles of technical specialists may seem uncertain.

This in itself is a worrying trend as we live in a world of increasing complexity, based more and more on advanced technologies. It's difficult to imagine that the need for expert technologists and scientists is going to diminish. And the reality is, of course, that it will not - demand can only increase.

Of course, attracting young people to consider a career in food technology is part of a bigger problem which is how to attract young people to consider a career in the food industry at all. The industry offers many careers and, I would argue, those careers can be exciting and rewarding.

The industry as a whole, however, is probably not as glamorous as some

and possibly has an image problem. It is a rare occasion that a good news story appears about the food industry, with the most common stories focussing on the role of, and often apportioning the blame to, the food industry regarding issues such as the obesity epidemic and, more recently, the pollution of our oceans with plastics. The industry products and their marketing are often attacked. The AFGC is doing what it can by emphasising the many positives associated with the industry, including through the recent 'we're from here' campaign.<sup>1</sup>

Many young people seek out careers which allow them to contribute positively to society. The challenge for those of us in the food industry is to convey the message that the food industry is a force for good. The AFGC has always maintained that the industry itself is critical to the wellbeing of consumers in Australia and many more overseas - we literally cannot live without it - contributing to the health of the nation. As a large industry both in the domestic and overseas markets it contributes substantially to the wealth of the nation.

Notwithstanding that, as with all industries, it has an impact on the wider environment through the products it produces and the processes it uses. It is incumbent upon the industry to minimise those impacts.

The industry has a strong track record, and increasingly so, of developing and implementing initiatives and programs which address these societal issues - the health and wellbeing of consumers and the environment. So the industry is very much a force for good. To attract more young people into the industry, including as food scientists and technologists better promotion of the industry on this basis is required.

Returning more specifically to the training of food technologists perhaps an additional reason for boosting the numbers is simply that the more individuals who appreciate the form and function of the processed

food industry the better. Exposing secondary school students to food technology and the concomitant nature of food manufacturing may not result in many of them going on to seek careers in the industry, but at least there would be more, better informed people in the community able to engage in informed debate about the food system and the role of the food industry in bringing safe, affordable, nutritious food from the farmer's paddock to the tables of consumers.

There's no doubt in my mind that food science and technology is a 'hidden' profession. Little is known about the advanced manufacturing processes and all its complexities which are employed by the industry. Many consider food manufacturing to be kitchen cooking on a larger scale. But the reality is somewhat different. Typically, product has to be handled and processed by the tonne, then packaged, all within stringent quality specifications. Our challenge as food technologists and scientists is to explain and promote the profession so that it is valued more by the community. Hopefully this would result in a flow-on effect to bolster the value placed on the food industry as a whole.

I suspect that the AFGC, in partnership with AIFST, will for some time be looking for ways to bolster the profession and the industry. Looking back at my own career path, as originally advised by my mother, I don't think I would change anything.

Always interesting, always challenging, always rewarding and most importantly always worthwhile are the key messages for the young people today as they look to their futures. Working in the food industry, particularly as a technologist, in my opinion ticks all the boxes.

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*Dr Geoffrey Annison is deputy chief executive at the AFGC and Professional Member of AIFST* 



# FOOD FILES

*Words by Drs Russell Keast,  
Georgie Russell and Gie Liem*

## Food, cooking and education

The professional chef is more visible than ever, and the general public have a high interest in all things food. The advent of digital TV channels, podcasts, the internet and connectivity generally has resulted in an explosion of food related programming, often involving chefs. Think David Chang, Jamie Oliver, Gordon Ramsey - the list of chefs using television to appeal to consumers grows year on year.

While less visible, there is also increasing interaction between chefs and scientists - there are natural links, especially for those working in food science, between food choice, obesity and sensory science, for example. From a science perspective the links are productive because it gives insight into a different way of thinking and an opportunity to translate research findings on a small scale.

But there are other potential benefits for the university sector and food science departments. Given that cooking has such wide consumer

appeal, it is a useful vehicle for developing public interest in science and addressing many of the changes and transformations that occur when we create foods or meals. There is potential for universities to be more active in the cooking discipline, to help develop a better understanding and appreciation of science.

As an example, Harvard has a course on Science and Cooking: From Haute Cuisine to Soft Matter Science (chemistry).<sup>1</sup> The related blog states "Top chefs and Harvard researchers explore how everyday cooking and haute cuisine can illuminate basic principles in chemistry, physics and engineering. Learn about food molecules and how chemical reactions can affect texture and flavour".

In addition, every year Harvard hosts a public science and cooking lecture series that pairs Harvard professors with top chefs to showcase science. Food and cooking create an ideal medium to promote science to the public. Perhaps this is an area that could be further developed in Australia.

## Tailored educational approaches

Individuals differ in their capacity to self-regulate their appetites and this affects decisions around what, when and how much to eat. The reasons underlying these differences relate to a range of individual biological, psychosocial, social and environmental characteristics and their associated processes and mechanisms.

For example, appetite self-regulation is influenced by a range of factors including our metabolic state, brain functioning, hormones, reward processes, our prior experiences with foods and the current food environment.<sup>2</sup>

Differences within and between individuals in these factors can help explain why some approaches to change food choices or weight status work better for some people more than others. The one-size-fits-all approach to designing education and intervention strategies is therefore not likely to be the most effective way of changing food choice and intake, and there is a need for novel,

tailored approaches instead. What might these look like? We have argued that information on individual differences in the mechanisms underlying appetite self-regulation and associated behaviours is likely to be a productive avenue.<sup>3</sup>

In this sense, these approaches would be matched to the unique mechanisms and influence processes that determine what, when and how much individuals eat. For example, for some individuals who have difficulties managing negative emotions, combined with a poorer ability to resist impulsive food decisions might mean that tasty (but unhealthy) junk foods are selected and consumed.

For others, though, junk food consumption could be related to poorer reward-related brain activity, greater accessibility to these foods and a focus on short-term rather than longer-term outcomes. That is, individuals may choose and consume foods for different reasons and would require different strategies for change.

This perspective is a departure from traditional views which have focused on identifying subgroups within the population at risk of poor eating or weight outcomes and have typically only speculated about influence processes. Understanding the processes that affect food choice and consumption for different individuals in a range of situations can help those who are interested in shifting these behaviours design the most effective approaches.

### Digital sensory marketing

A true impactful product experience involves all the senses. Yet in the digital age, we are often deprived from most of the sensory inputs. We can watch a YouTube video about a delicious dish, but we can't taste, smell or feel the texture. Nor can we listen to the sound food makes in our mouth, which helps determine crispiness and the freshness of the food.

This lack of sensory input opens a door to a new type of sensory marketing - digital sensory marketing. Where does the technology stand,



and what are the benefits of these technologies? In a recent review by *Petit et al* in the journal of interactive marketing,<sup>4</sup> Petit lays out the future landscape.

Sensory enabling technology (SET) is in its infancy. Although long predicted, we still do not have a reliable smell-tv system. We have touch screens, but these do not mimic the actual texture of whatever you see on a screen. But do we really need to have the real stimulus, for example odour, to trigger a sense's typical response? In real life, we learn to associate visual and auditory inputs with input from other senses.

For example, seeing somebody bite into a lemon, can make you 'taste' the sourness and increase the salivary flow in your mouth. The more people feel immersed in a particular visual scene, the more likely it is that people experience sensory stimulation associated with these environments, even if the actual sensory stimulus is not present.


An immersive experience can be created with virtual reality, or by increasing the customers' opportunity to interact with the product (for example 3D images which can be turned around, or providing the

possibility to zoom into a product).

As advances in SET slowly move forward, touch in addition to visual and auditory stimuli are the most promising. We seem to be a long way off from our smell TV. The good news is that in many cases the visual representation of a product and consumers' ability to interact with the product, in combination with the experience consumers have in real life, will go a long way in convincing consumers to buy a product.

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*Drs Russell Keast, Georgie Russell and Gie Liem are from The Centre for Advanced Sensory Science, School of Exercise and Nutrition Sciences at Deakin University.* 



### Mark Turner

Mark Turner is a Deputy Head of School and Associate Professor in food microbiology in the School of Agriculture and Food Sciences at the University of Queensland. He currently heads a research team in the area of food quality and safety and teaches food microbiology, food safety and food biotechnology courses. His current research focus is in lactic acid bacteria genetics, comparative genomics, biocontrol and cheese flavour applications. He is a member of the editorial board of the international peer-reviewed Journal of Food Protection and mBio.

#### Why should students consider studying food science?

Food science is critical for the supply of food that is safe, good quality and nutritious. There will always be challenges in food production and processing that food scientists will need to meet. Our students enter a wide range of roles, such as in food quality, safety, product development or technical roles in food microbiology or chemistry testing labs.

#### What was your path to becoming Deputy Head of School and Associate Professor in Food Microbiology?

My background is in microbiology/molecular biology and I was taught by Dr Peter Wood, an amazing lecturer who sparked a strong interest in food microbiology in many students including myself. I joined the University

of Queensland's food science section as a lecturer in food microbiology in 2007 after six years as a postdoctoral researcher in Brisbane and the USA. I was promoted to Senior Lecturer in 2011 and Associate Professor in 2015.

I coordinate and teach two food microbiology courses and have built up a research group with excellent staff and students over the years. I have thoroughly enjoyed working at the University of Queensland in a very supportive environment and have had great mentors along the way.

#### What is your food research team currently working on?

We are using some of the latest techniques in whole genome sequencing to better understand food fermentation bacteria (*Lactococcus*) and foodborne pathogens (*Salmonella*).


# FAST 5

We are also working in bio-preservative methods to improve food safety (salmonella control in ready-to-eat vegetables and listeria control in processed meats) and quality (mould control in cheese).

#### What path of study would you recommend for someone wanting to study food microbiology?

For school leavers, a Bachelor of Science with a major in food science and technology or food science and nutrition is our most popular path. For those that already have a bachelor's degree in another field, a coursework Masters in Food Science and Technology allows specialisation.

#### What careers do students who study these subjects commonly end up in?

Students in my food microbiology class will typically do most of our food science and technology subjects, or will come from food engineering and nutrition programs. My job is to make food microbiology interesting to students and get them to appreciate the role of microbes in food poisoning, spoilage and fermentation. 

## Australia 2020

**February 9-12 World Congress on Oils & Fats 2020 International Convention Centre** *Sydney*  
[www.wcofsydney2020.com/](http://www.wcofsydney2020.com/)

**February 10-12 NZOZ Sensory and Consumer Science Symposium** *Melbourne*  
[www.aifst.asn.au/2020-nzoz-sensory-and-consumer-science-symposium-0](http://www.aifst.asn.au/2020-nzoz-sensory-and-consumer-science-symposium-0)

**February 24-25 AIFST Summer School**  
*Melbourne*  
[www.aifst.asn.au/2020-aifst-summer-school-0](http://www.aifst.asn.au/2020-aifst-summer-school-0)

**March 19-20 Food Safety & Security ANZ**  
*Melbourne*  
[www.marcusevans-conferences-australian.com/marcusevans-conferences-event-details.asp?EventID=25634#.XdZY7lczaUI](http://www.marcusevans-conferences-australian.com/marcusevans-conferences-event-details.asp?EventID=25634#.XdZY7lczaUI)

**April 1-2 AIP Australasian Packaging Conference**  
*Melbourne*  
[aipack.com.au/event-registration/?ee=248](http://aipack.com.au/event-registration/?ee=248)

**July 6-7 AIFST Annual Convention 2020**  
*Melbourne Convention and Exhibition Centre, Melbourne*  
[www.aifst.asn.au/2020-aifst-convention](http://www.aifst.asn.au/2020-aifst-convention)

## International 2020

**February 25-28 Global Food Safety Initiative Conference** *Seattle, USA*  
[www.theconsumergoodsforum.com/events/gfsi-conference](http://www.theconsumergoodsforum.com/events/gfsi-conference)

**March 31 - April 3 FHA Food & Beverage 2020**  
*Singapore*  
[www.fhafnb.com](http://www.fhafnb.com)

**April 15-17 ANUFOOD China**  
*Shenzhen World Exhibition & Conventions Centre, Shenzhen, China*  
[www.anufoodchina.com](http://www.anufoodchina.com)

**July 12-15 IFT Meeting and Food Expo** *Chicago, USA*  
[10times.com/ift-food-expo](http://10times.com/ift-food-expo)

**August 2-5 International Association of Food Protection** *Cleveland, USA*  
[www.foodprotection.org/annualmeeting](http://www.foodprotection.org/annualmeeting)

**August 17-20 20th World Congress of Food Science and Technology** *Aotea Centre, Auckland, New Zealand*  
[www.iufost2020.com](http://www.iufost2020.com)



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