

# food australia

APR/MAY/JUN 2018

## INNOVATION IS THE FUTURE OF AUSTRALIAN FOOD

*How FIAL is taking Australian food businesses to the next level*

**WHAT DOES BLOCKCHAIN MEAN FOR THE FOOD INDUSTRY?**

**WHY DO WE EAT WHEN WE ARE NOT HUNGRY?**

**THE FUTURE OF FOOD SAFETY**



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FOOD INNOVATION AUSTRALIA LIMITED



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an initiative of the Allergen Bureau

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- VITAL Guides
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# CONTENTS

APR/MAY/JUN 2018

## regulars

- 4 Food for Thought
- 5 By the Numbers
- 6 Your Institute
- 12 The Pulse
- 16 Young Professionals
- 46 Fast Five

### THE GRIST

**18 Will Blockchain Affect the Food Industry?**  
There's more to blockchain than cryptocurrency and it could have big implications for the food industry.

**21 FSANZ Update**  
New breeding techniques, new premises and new applications.

**22 Why Should Legal and Regulatory be Involved in Product Development?**  
There are myriad benefits but they all contribute to one very good reason.

### INDUSTRY INNOVATORS

**23 A Framework for Innovative Growth in SA**  
South Australia now has a strategic framework for the state's food and beverage industry.

**24 Innovation is the Future of Australian Food**  
How FIAL is taking Australian food businesses to the next level.

**31 Australia 2030: Prosperity through Innovation**

### FOOD FILES

**32 What Does the Ageing Population Mean for the Food Industry?**  
Nutritious food that contributes to good health and independence will be key to the world's fastest growing demographic.

**34 The Glycaemic Index of Foods – Driving Innovation and New Market Opportunities**  
The classification system for carbohydrates based on their actual physiological effects in the body has stood the test of time.

**38 Why Do We Eat When We Are Not Hungry?**  
At what point will consumers reject modified foods? What are the conscious and unconscious predictors of food choice? Will consumers sacrifice taste for sustainability?

### FUTURE FOOD

**40 The Future of Food Safety – Making it Stick**  
The Australian food industry is on the cusp of change that will make real time food safety effective.

### FARM TO FORK

**44 Loving Lupins**  
Australian Sweet Lupins are capturing the attention of the food industry and consumers.







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## FOOD FOR THOUGHT

Welcome to the second edition of *food australia* for 2018.


The first quarter of 2018 has been a busy one for AIFST with our move to North Ryde, finalising membership renewals, the launch of the mentoring program, planning for the AGM in May and the convention in September.

The AIFST mentoring program kicked off on March 16 with an induction of mentors and mentees in person and via video conference. This is our first year of the national program following on from the pilot program which ran in 2017. This year we have 26 mentor/mentee pairs from across Australia taking part in the six-month program which will culminate at the 2018 convention in Melbourne in September. I would like to thank all those who are taking part – it is great to see so many members supporting the future of our industry.

We have a really exciting few months coming up with our focus on supporting the Communities of Interest in running events which provide the opportunity for learning and networking.

This edition of *food australia* is focused on the theme of "Food Innovation" and we are excited to share some great stories of Australian innovation, although we are just scratching the surface.

Most people will be aware of the rise of cryptocurrency, particularly Bitcoin and the corresponding tales of newly minted millionaires, but you may not be aware that behind cryptocurrencies is the method used for recording the transactions – blockchain. What does this have to do with the food industry, you may ask? As well as explain how blockchain works, Chris Preston explains the impact it will have on our sector. We also look at how FIAL is supporting innovative producers and supplier, and be sure to check our CSIRO's top 6 innovative food technologies.

We have our AGM coming up on 31 May in Sydney and I would encourage all members to attend either in person or via teleconference. I look forward to seeing you there. 

#### PETER SCHUTZ

Chair, AIFST



  
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# GOT MILK?

*The humble glass of milk has an iconic place in our diets and our culture. Things have changed a lot since we woke to the clink of milk bottles, but the nutritional powerhouse is still going strong.*

**A**round six billion people across the world consume milk or milk products. But it was not always so – once only children drank milk because adults did not produce the enzyme, lactase, necessary for digesting milk. Thankfully a genetic mutation solved that problem and now many of us can enjoy a cold glass of milk. Although now there is a dizzying array of choice in our supermarket refrigerators and shelves. The milkman may long ago have retired from his morning route and the iconic ad campaign 'Got Milk?' has also been let go, but let's wipe off that milk moustache and have a look at the numbers. <sup>©</sup>

DAIRY IS AUSTRALIA'S  
*3rd Largest*  
RURAL INDUSTRY

*5,789*  
DAIRY FARMS IN  
AUSTRALIA

*1.51*  
*million*  
DAIRY COWS IN  
AUSTRALIA

AVERAGE HERD SIZE IS  
*261 cows*

*5,819*  
*litres*  
AVERAGE ANNUAL  
MILK PRODUCTION  
PER COW

AUSTRALIAN DAIRY  
FARMERS PRODUCE  
*9,015*  
*million litres*  
OF WHOLE MILK  
PER YEAR

FARMGATE VALUE OF  
MILK PRODUCTION IS  
*\$3.7 billion*

*65%*  
OF DAIRY CATTLE  
ARE HOLSTEIN

*37%*  
OF AUSTRALIAN  
MILK PRODUCTION  
WAS EXPORTED IN  
2016/17

*\$3 billion*  
OF DAIRY EXPORT  
REVENUE IN 2016/17

*6%*  
OF WORLD  
DAIRY TRADE  
CONTRIBUTED BY  
AUSTRALIA

*42,000*  
PEOPLE DIRECTLY  
EMPLOYED IN  
DAIRY INDUSTRY

*103 litres*  
AUSTRALIANS CONSUME  
AN AVERAGE OF LIQUID MILK PER YEAR

Source: Dairy Australia.





## Q&A JENNIE FRANCESCHI

*When Jennie Franceschi comes across a problem, she likes to solve it. Now her innovative solution is in supermarkets and winning awards.*

In Manjimup, a small town 300 kilometres south of Perth in Western Australia, Jennie Franceschi has created a thriving business that uses cutting-edge technology to reduce one of the most pervasive problems in our society – waste.

Fresh Produce Alliance uses high pressure processing (HPP) to create nutritious, preservative-free products from produce that normally never makes it past the farm gate. It's a win for the war on waste and for the sustainability of beleaguered farmers who now have a market for unwanted produce.

Franceschi started by playing to her strength and expertise – avocados. Fresh Produce Alliance produces, markets and sells Avovita, a range of avocado-based products such as mousse and smoothies sold through Harris Farm and IGA. That successful foray soon led to Born Pure, a range of baby purees, mashes and blends available exclusively at Woolworths.

Franceschi's hard work and innovation garnered even more attention when she was named 2017 WA Telstra Business Woman of the Year and also received the Telstra National Corporate and Private Award.

The AIFST interviewed Jennie about her business, the importance of food technology and winning the Telstra awards.

### **JENNIE, WHY DID YOU START FRESH PRODUCE ALLIANCE?**

I have been involved in the horticulture industry since 1974 with my family's commercial orchard. We wanted to grow avocados, but we were told by agriculturalists that we could not grow avocados in WA – they are a QLD product. We thought, "We're going to give it

a shot." But Fresh Produce Alliance is more than that. The avocado industry has been successful in the fresh produce space, but there is an issue with the waste of unmarketable produce. Fresh Produce Alliance is about developing products that will give our industry a wider distribution channel beyond fresh. People are now more aware of the food they are eating – they don't want as many preservatives. They want real food. High pressure processing and instant quick freeze technologies give nutrient integrity and food safety without putting additional substances in food. The principle of Fresh Produce Alliance is to provide a more wholesome way of eating; and these technologies are a real game changer for us.

We grow amazing produce in Australia, and there is a need for us to act smart. We sell our high quality produce as commodity items and we could add so much more value. High pressure processing is the processing method of choice for avocados; it really is an amazing technology!

### **TO WHAT DO YOU ATTRIBUTE YOUR BUSINESS SUCCESS?**

I am a person who solves problems. I think differently when I see a problem. I like to identify where there are other issues associated with the problem and what are the ways we can deal with them. I especially like to solve problems for growers. Farms are being sold out and so farming is becoming more corporate in Australia. People complain about foreign ownership in Australia but don't seem to do enough about it. The key to success is to not sit and complain – be prepared to find solutions to problems.

I like to create a culture in my business where we change the way people think. It is important to motivate people to think





*“Our mission is to champion a sustainable agricultural ecosystem for future generations by connecting responsible agricultural production with innovative technology to produce naturally healthy, delicious, real foods people love. We make healthy delicious.”*

differently and fundamentally work together, and then leverage our government bodies to participate. I have a team of people who are motivated, well supported and solution-focused. We are always looking for opportunities to collaborate so Australia can be competitive on a global platform with our high-quality food products and the way we run our businesses. We don't realise how lucky we are in Australia. We are so fortunate! Certainly as a woman in Australia, I can put my mind to solving problems with hard work, dedication and diligence.

#### **HOW DO YOU USE FOOD TECHNOLOGY IN THE ORGANISATION?**

I employ food technologists and they are very valuable to the business. It is a real challenge getting food technologists to work in regional areas. But it is so important to create industry in regional areas. I have two food technologists on the team and both are from overseas. They are both really pleased to be living and working in Australia.

Food science and technology is incredibly important in our society. They are important for the whole supply chain. You can grow food, but then you need a food technologist to really add value and take the food to market. Food technology is exciting for someone like me because there are so many methods of innovation and technologies available. There are so many ways you can use food science and innovation to create food that is convenient and still do it in a way where the food remains wholesome. We have a responsibility to feed people healthy food that is safe, tasty, affordable, and nutrient dense.

#### **HOW IMPORTANT IS INNOVATION TO YOU?**

Innovation to me is investing in new ways of doing things in any part of the organisation. It should be important to everybody's business. It is always important to look at innovative ways of doing things because often people don't know what they don't know; and by embracing innovation they can bring efficiencies and value to business.

Born Pure is a great example of innovation at Fresh Produce Alliance. Thirty per cent of horticultural products do not leave the farm gate due to issues with appearance so all of this product gets wasted and there is no return on investment. Using innovation such as HPP adds value and supports farmers. Then all of the produce

has a home to go to. I also see so much potential in innovating in a collaborative way – we need to encourage a culture of working together with innovation to produce the best results. Businesses need to ask themselves: Do we want to be a leader or follower?

I am a risk taker, and I do instigate change by leading by example. Australian business needs to realise that the competitor is not each other, it is the rest of the world! Our goal should be to grow our industry into a big industry because in a big industry we will all do okay. In a small industry, we won't. It is so important to work together to become strong and become more export focussed.

#### **WHAT ADVICE WOULD YOU GIVE TO EMERGING BUSINESS OWNERS IN THE FOOD INDUSTRY?**

I would advise them to open their minds and never stop listening and learning. People often do things in their business but don't think hard enough about the market and the processing that is needed to get to market. What are you going to do with your hemp, nuts, carrots or whatever you are growing or producing? You MUST know your market. Look hard at global trends. Think and ask: In what direction is the world going? How do I fit in? Who do I take with me? Get good people around you. Motivations and ethics are very important. NEVER become involved with someone who does not have the same moral barometer as you.

#### **ON WINNING THE TELSTRA AWARDS...**

It was a complete surprise! I met so many amazing people. I kept asking “Why me?” But then I thought: “I believe in myself. I back myself. I can grow a business so I can create a better opportunity for other people. I can really help.” Through the experience I met an amazing network of women. They support women and don't bring each other down. Really, just being with these inspiring women, I was already a winner! Through this experience, I know that I can motivate, inspire, unite people and make change. I can help others – particularly those in regional Australia. The avocado industry is in great shape! Now, what other industries can I help? 🍌



# 12TH AUSTRALIA & NEW ZEALAND SENSORY & CONSUMER SCIENCE SYMPOSIUM

*King's College, University of Queensland, 5-7 February 2018, Brisbane*

WORDS BY AIFST SENSORY COMMUNITY OF INTEREST



**M**ore than 60 delegates specialising in sensory science and consumer evaluation congregated at UQ's Kings College in Brisbane earlier this month for the 12th Australia and New Zealand Sensory and Consumer Science Symposium. With the support of AIFST, and hosted by the University of Queensland (QAAFI, UQ) and the Queensland Department of Agriculture and Fisheries (QDAF), it was largest gathering the symposium had seen in several years. Sensory science and marketing research experts spanning eight Universities, more than 20 companies and five government research institutes attended.

The three-day program involved a number of presentations and sensory demonstrations as well as an Australian native food tasting and workshop. Guest speaker Prof Joanne Hort, Chair of Consumer and Sensory Science at Massey University in New Zealand, spoke on "Contemplating the influence of individuality and context on perception". Her engaging presentation highlighted the need to consider the variation in how individual consumers taste and sense food and the importance of how context of consumption can affect consumer acceptance of products. Prof Hort also introduced the concept of thermal taster status, where up to 50 per cent of the population are able to taste sensations like salty, sweet or bitter when rapidly heating or cooling the tongue. This phenomenon may have important implications for food companies formulating hot or cold food and beverages.

It is exciting to have Prof Hort join the ANZ sensory community since her move to Massey in July 2017 through a partnership with Fonterra and the Riddet Institute Centre of Research Excellence. Previously the SABMiller Chair of Sensory Science at the University of Nottingham, Prof Hort established the University of Nottingham Sensory Science Centre, which is internationally renowned for both its sensory training and research into flavour perception. We look forward to what the future holds for Prof Hort in her new position and with her involvement in the local ANZ sensory community.

Other presentations covered topics from wine and soft drinks to fruits and vegetables, dairy products, mayonnaise and snack foods. Discussions were held on how to improve sensory methods to make them more suitable for industry applications as well as recent developments in the use of eye tracking and virtual reality platforms to conduct consumer choice experiments. Oral processing was another hot topic, with ideas shared on the importance of taking into account how much consumers differ in the way they manipulate food in-mouth and the implications this has on texture perception.

Next year the Symposium will be held in Dunedin, New Zealand, before returning to Australia in 2020.📍

*For further information, or to be included on the mailing list for this event, please contact the AIFST Sensory Community of Interest at [aifst@aifst.com.au](mailto:aifst@aifst.com.au).*



## QLD: FOOD AGILITY CRC UPDATE BY PROF MIKE BRIERS

WORDS BY JOHN HINE,  
QUEENSLAND COMMUNITY OF INTEREST MEMBER

In early February the Queensland Community of Interest organised a talk by Prof Mike Briers, the CEO of Food Agility, a Cooperative Research Centre. The Food Agility CRC aims to empower Australia's food industry to grow its comparative advantage through digital transformation. At QUT Brisbane, Prof Briers spoke on the finer points of the CRC and on the importance of data, its collection and the next stage of commercial application.

Briers explained how data management and analysis techniques developed for the finance industry have been used by the CRC and incorporated into the agro-food industry. The application of data aggregation techniques means that the CRC can access good data that is both cheap and reliable, which is crucial to support the development of scalable digital services for industry that is looking to lower risks in their decision making.

Prof Briers also spoke on the incorporation of new and emerging technologies to facilitate data collection. CRC partner, Bosch, whose own products are all internet connected, will be a key player in the commercialisation of these technologies. As more and more devices and sensory equipment are connected, it is now possible to substantially increase measurement and image collection from a variety of locations. This interconnection will aid the CRC to provide data across the supply chain, from paddock to plate.

Although just six months old, having put in place its governance



and management systems and with around \$210 million to invest in research and the development of its research programs, the future is bright for the Food Agility CRC. AIFST would like to thank Prof Briers for presenting a detailed view of what the CRC is about and its possibilities. It's a case of watch this space and look to see if your company can use such techniques to develop new products and processes or better manage existing processes.

A personal comment by the writer is whether the Australian agro-food sector has the businesses to handle such new technology. Do we need new business models to get to the size necessary to apply such new technologies and identify and realise new market opportunities?

For more information on the Food Agility CRC, please head to their website at [www.foodagility.com](http://www.foodagility.com).

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# *SAVE THE DATE – 2018 AIFST CONVENTION 11 – 12 SEPTEMBER 2018*

**MELBOURNE CONVENTION AND EXHIBITION CENTRE**

## **INNOVATE OR STAGNATE: ACTING TODAY TO ADVANCE TOMORROW**

The AIFST Convention is held from 11 – 12 September 2018 at the Melbourne Convention and Exhibition Centre (MCEC). In 2018, AIFST will co-locate with Fine Food Australia with representation from SMEs, foodservice and hospitality.

The Convention theme is Innovate or Stagnate: Acting Today to Advance Tomorrow. The program will include tangible and practical information that is relevant to today's operating environment, as well as insights and information that is future focussed.

## **WHAT CAN YOU EXPECT IN 2018?**

With a new and engaging format, delegates will have the opportunity to seek business solutions and assistance at the new Ask the Expert Lounge, and have the option to arrange one-

on-one meetings with leading technical, research and service providers. The Convention will also host a Trade Exhibition.

## **SPEAKING OPPORTUNITIES – SUBMIT AN ABSTRACT**

AIFST is calling for abstracts that demonstrate cutting-edge science, technologies and innovation.

If you or your organisation has something new to say then let us know! If you are interested in submitting an abstract, please see the abstract information on the AIFST website and submit your expression of interest to AIFST via [aifst@aifst.com.au](mailto:aifst@aifst.com.au) by midnight on Monday, 30 April 2018.

## **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.



# BOURNE EXHIBITION CENTRE

To discuss ways your organisation would like to participate in the 2018 AIFST Convention, contact AIFST today via [aifst@aifst.com.au](mailto:aifst@aifst.com.au).

## CALL FOR POSTER PRESENTATIONS

AIFST is calling for Poster Presentation submissions. 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 midnight on Monday, 16 July 2018.


## WINE AND CHEESE TASTING SENSATION – 11 SEPTEMBER 2018

The ever-popular Wine and Cheese Tasting Sensation remains a key part of the social program.

The Wine and Cheese Tasting Sensation is included in all Full Convention Packages and any one-day Convention Registrations purchased for Tuesday, 11 September 2018.

## CONVENTION REGISTRATION

Registrations to attend the 2018 AIFST Convention open early May 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, 16 July 2018. 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. 

# AIFST AWARDS PROGRAM OPEN FOR 2018

Applications are open for the 2018 AIFST Awards! Nominations close on 1 July 2018 and winners will be presented with their award at the 2018 AIFST Convention. Visit the AIFST website for all award guidelines and nomination forms.

## AIFST PRESIDENT'S AWARD

The AIFST President's Award recognises and acknowledges an individual or an organisation that has made an outstanding contribution to advancing the Institute.

## AIFST JACK KEFFORD BEST PAPER AWARD

Recognises the contribution to food science and technology by members who publish research and technical papers in honour of AIFST Past President, Jack Kefford.

## AIFST KEITH FARRER AWARD OF MERIT

Acknowledges members' achievements within the food industry in the areas of science, technology, research, industry and education, and their contributions to advancing the Institute in honour of Keith Farrer.

## AIFST YOUNG MEMBERS MALCOLM BIRD COMMEMORATIVE AWARD

This award is for young AIFST members who demonstrate academic achievement, leadership and integrity in their profession in honour of AIFST Past President, Malcolm Bird.

## AIFST BRUCE CHANDLER BOOK PRIZE

Awarded to AIFST members who have published a book that has made a great contribution to the literature on food in honour of AIFST Past President, Bruce Chandler.

## AIFST FOOD INNOVATION AWARD


The AIFST Food Innovation Award acknowledges a significant new development in a process, product, ingredient, equipment or packaging that has had successful commercial application in any section of the Australian food industry. The award is given in honour of AIFST Past President, Peter Seale.

## AIFST SENSORY AWARD

The AIFST Sensory Award is for young members who demonstrate academic achievement, interest, enthusiasm and integrity in sensory research. The AIFST Sensory Award is sponsored annually by Sensory Solutions in honour of Anthony (Tony) Williams.

## THE ALLERGEN BUREAU AWARD FOR BEST PRACTICE FOOD ALLERGEN MANAGEMENT

This award recognises excellence in food allergen management in Australia.

For further information phone 0447 066 324, email [aifst@aifst.com.au](mailto:aifst@aifst.com.au) or visit the AIFST website at <https://www.aifst.asn.au/aifst-annual-awards>. 





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GROWING COLOURS



**HEALTHY MEAL KITS FOR ALL**

Services to assist consumers deal with the daily 'what's for dinner?' question has certainly diversified in recent times. Looking beyond chilled, frozen and prepared dishes bought from traditional grocery channels, the meal kit solution means that time-poor consumers can more or less avoid cruising supermarket aisles (or relying on UberEATS).

All delivered meal kit solutions have a strong focus on health, convenience and of course taste. The two early entries into the Australian market are Hello Fresh and Marley Spoon, which both provide well-balanced, healthy, delicious dinners for consumers to cook and eat at home.

Meal kits work well for consumers who love to cook but hate to plan meals and go grocery shopping, those who are happy to "take a risk" and try new recipes, and definitely for consumers who value time just as much as money. Healthy meal kits are also in line with global trends around personalisation of goods services and a recognition that one size does not fit all.

**NO DESIRE TO COOK. OR PLAN. OR SHOP**

Australian company Youfoodz offers a delivery service of fresh, pre-made meal plans. Simply reheat and you are good to go. Meals are designed and prepared by nutritionists and chefs, with an emphasis on whole foods and healthy ingredients. The meals are prepared and packaged with a vacuum seal system. Youfoodz is highly personalised and geared towards individuals rather than families. Interestingly, these meals are retailed at selected Caltex services stations and IGA stores in capital cities.

**TIME POOR AND BUDGET CONSCIOUS**

The Dinnerly meal kit is a low-cost meal kit option offered by Marley Spoon, a subscription food service that takes the effort out of meal planning by delivering recipes and ingredients to your door. Marley Spoon Managing Director Rolf Weber told the Financial Review that the company borrowed from the Ikea furniture model to develop the low-cost brand and alleviate pressure on budget-conscious families. To keep costs at about \$5.75 per meal, about half the price of a Marley Spoon meal, Dinnerly customers receive digital recipes, have less ingredients in their home meal boxes and the ingredients aren't placed into separate packages designed for each individual meal like Marley Spoon.

**DIETARY AND SPECIAL NEEDS**

Meals on Wheels was established in South Australia in 1952 by Doris Taylor MBE. Doris was permanently disabled by the age of sixteen as a result of a childhood accident. Living the rest of her very active life confined to a wheelchair, this intelligent, compassionate and energetic woman became acutely aware of the problems disadvantaged people in society faced. She asked herself the question: "Would a hot midday meal be the most sensible and practical way of bringing sustenance to these people?" And so a cooked food delivery service – run solely by volunteers with a focus on the aged, housebound and disabled – was born.

Today, Meals on wheels is still going strong but the needs of the aged, housebound and disabled are no different. Australians living with



disability experience substantially higher rates of preventable chronic disease, and subsequently much poorer health outcomes and a lower quality of life than the general population.

New players to the field include Hit 100, a registered National Disability Insurance Scheme provider of home-delivered meals and dietitian services to parts of NSW and the ACT. Billed as a complete food and nutrition service, the organisation is passionate about supporting persons living with disability to achieve their individual goals. Hit 100 is a Certified B Corporation and was named a 2017 Westpac Business of Tomorrow.

Hit 100 subscribers can choose from a range of healthy meals and dietitians make home visits to provide nutrition advice and help clients achieve their health goals. NDIS funds meal preparation, delivery and dietitian coaching, meaning subscribers to the service only need provide a small co-payment.®

## *IMPROVING THE QUALITY OF READY-MEALS WITH MATS*

Microwave Assisted Thermal Sterilisation (MATS) processing is a new food preparation technology that uses rapid sterilisation techniques to create shelf-stable, ready-to-eat meals. MATS technology was developed in the USA through a consortium led by Washington State University (Pullman, WA) but is being commercialised via 915 Laboratories (Denver, Colorado, USA). The original driver was to improve the quality of foods for US Armed Forces on deployment. It also meets the need for emergency food provision where deposition of long shelf life food is used. However, the main applications now being developed are to improve convenience ready-to-eat and ready-to-serve foods.

The MATS system is a continuous process where the food packages are transferred through preheating, microwave (MW) heating-holding and cooling chambers to accurately control the temperature and time exposure of the food. The microwave process at 915 MHz enables deeper energy penetration compared to domestic microwaves. This in turn allows more rapid volumetric heating as opposed to the purely surface heat transfer of normal retort processes. Faster more precise processing in sealed food trays enables better preservation of 'fresh-like' quality including appearance, aroma, flavour, texture and nutritional quality.

In Australia a MATS program is being established via Defence Science and Technology (DST) in conjunction with Centre for Food Innovation collaborators at the University of Tasmania and CSIRO. A MATS-B100 pilot plant system is being commissioned at the Defence Science and Technology Group facility, Scottsdale, Tasmania. The objectives of the Australian program are to improve Defence feeding systems by providing better quality meals into Defence environments for improved health and performance of soldiers as well as facilitate the Australian industry to understand and access the technology to create new products. In particular, it will assist local industry to target improved ready meal technology that will add value to Australian produce for export. ®



### ASK US HOW GNT CAN HELP.

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GROWING COLOURS **GNT**



*Winners of Australian Macadamias Innovation Challenge: Leonardo and Ashna Gobin Bohorquez; Kinga Wojciechowski and Adeline Wong.*

## AUSTRALIAN NUT INNOVATORS REVEAL CRACKING NEW CONCEPTS WITH WORLD-FIRST INNOVATION CHALLENGE

To inspire food manufacturers globally and encourage key decision makers to incorporate more macadamias into their innovation pipelines, the Australian Macadamia Industry Marketing Program has created a world-first platform to drive innovation and new demand for macadamias.

Years of research demonstrates consumers' overwhelmingly positive and emotional responses to Australian macadamias, and that adding macadamias elevates a food product and makes it more premium.

The Australian Macadamias Innovation Challenge initiative has attracted pioneers in new product development, ranging from students to professionals in fields including food technology and innovation. Each group submitted creative concepts for a new packaged food product highlighting macadamias in three key categories – bakery, snack and snack mixes, and ice cream – and in two cuisine profiles – Asian or Western.

Australian Macadamias' market development manager Lynne Ziehlke says the Innovation Challenge is all about driving new demand for macadamias amid increasing global supply.

"We know that global production is increasing and that consumers want to see more products with macadamias. This challenge is about inspiring food manufacturers across the world to take advantage of these opportunities," says Ziehlke. "Australia is leading the charge; our industry is really proactive and innovative in this space. We're driving demand and the innovation agenda to benefit both the Australian and global macadamia industry.

Ziehlke says that it was exciting that the Innovation Challenge final took place in Australia's largest macadamia growing region and that the organisation was honoured that growers took time out from their busy harvest preparations to attend.

Adeline Wong, a professional entrant who created Macadamia Mind Food Bars, and student Kinga Wojciechowski, who created

Miso Caramel Cookies, each won a trip to SIAL Paris 2018, the world's largest food exhibition. The team behind Macci Ice Cream, Ashna Gobin and Leonardo Bohorquez, won a \$5,000 cash prize.

Wong, Gobin, Bohorquez and Wojciechowski were selected as the standouts based on their excellence in key criteria, including taste, presentation of product, insight behind the innovation and originality in the market.

The entries were judged by four leading industry representatives: Pam Brook, co-founder of Brookfarm, Australia's leading producer of gourmet macadamia cereal and snack products, Nick Palumbo, founder and co-owner of Gelato Messina, Dr Barry McGookin, food technologist and general manager of Innovation FIAL, and William Peterson, owner of Infinity Bakery.

The judges were impressed by the high standard of the finalists' entries and excited by where they could lead. Pam Brook says that all the judges found the depth of innovative thinking from the entries incredibly exciting.

"As soon as these products touched our tastebuds we loved them. All the winners demonstrated a strong point of difference to traditional products available, presenting innovations that reveal a huge opportunity in the local and international market," she says.

"We received an impressive quality of entries from research and developers through to University students who have created exciting new pipelines for Australian macadamias," says Ziehlke.

Up until now global production of macadamias has been relatively limited, only representing about one per cent of global tree nut production, but in recent years there has been a wave of new investment in growing macadamias which means they will become more available globally.®

*The judging event and winner announcement ceremony took place at Harvest, Byron Bay on 1 March.*





*Miso Caramel Cookies created by Kinga Wojciechowski.*

## SAVE THE DATE

### NATIONAL EVENTS

*13 April 2018*

**Country of Origin Labelling workshop**  
Perth

*19 April 2018*

**Allergen Bureau Webinar:  
Identification & Control of  
Food Allergens**  
National

*29 – 30 April 2018*

**Fantastic Food+Drink**  
Sydney

*24 May 2018*

**Allergen Bureau Webinar:  
Allergen Labelling & Recalls**  
National

*9 – 10 July 2018*

**Nutrition Summit 2018:  
21st World Congress on  
Nutrition and Food Sciences**  
Sydney

*10 – 13 September 2018*

**Fine Food Australia**  
Melbourne

*11 – 12 September 2018*

**2018 AIFST Convention**  
Melbourne

### INTERNATIONAL EVENTS

*16 – 17 April 2018*

**20th International Conference  
on Nutrition, Food Science  
and Technology**  
Dubai, UAE

*28 – 29 June, 2018*

**ICFSN 2018: 20th International  
Conference on Food Science  
and Nutrition**  
London, UK

*15 – 18 July, 2018*

**IFT – IFT18 Convention**  
Chicago, USA

*23 – 27 October, 2018*

**IUFoST World Congress of  
Food Science and Technology**  
Mumbai, India

# 2018 STUDENT PRODUCT DEVELOPMENT COMPETITION

## “KEEPING UP WITH THE CUSTOMER: CONSUMER-LED INNOVATION”

The AIFST Student Product Development Competition (SPDC) is on again in 2018! The annual competition is aimed at undergraduate and post-graduate students who want to take part in a real life product development process, from brief to shelf. It also provides a platform for students and graduates to demonstrate all they have learnt in their studies and apply their skills and abilities.

The SPDC was established over 15 years ago and since then has attracted team entries from leading educational institutions across Australia, with many previous entrants and winning team members going on to find fulfilling careers within both the Australian and global food industry.

## HOW TO ENTER THE 2018 SPDC

There are three key stages to the SPDC these include an initial entry proposal, proof of concept and finalist presentation including product testing. Here are the requirements for each stage:

### 1. INITIAL ENTRY PROPOSAL

The initial proposal submission is the first stage of the SPDC. It is a chance for entrants to identify concepts for their product in line with the product brief, develop ideas and the rationale as to why they have chosen that specific product. After all the submissions are judged, the teams with the highest scores who best fulfil the brief and have the most innovative products will then be selected as finalists to proceed to proof of concept stage.

### 2. PROOF OF CONCEPT

Once selected, all finalists will need to develop their idea into a physical product to present at the 2018 AIFST Convention. This stage of the competition is not marked, however it is a check-in point to address any major issues entrants may be having in developing their product, and for the judges to provide their feedback and guidance.

### 3. FINALIST PRESENTATIONS AND PRODUCT TASTING

At the 2018 Convention, finalists will be given time to present their product in person to the judges. This will be a chance to pitch their product, sell its benefits and convince the judges their product is the best! After the presentations, finalists will plate up their products for tasting. Judges will then be able to sample and assess the sensory components. Judges will ask one-on-one questions to entrants requiring them to defend their product and choices. The 2018 SPDC winner will be announced during the 2018 AIFST Convention Awards Ceremony.

Further information on the 2018 SPDC including submission dates, eligibility criteria and full competition brief can be found at the AIFST website, <https://www.aifst.asn.au>. Winners will be announced at the 2018 Convention. 📍

## THE BRIEF

In 2018, the focus is on consumer-led innovation, which challenges students to ensure they put consumers at the centre of their development. Entrants are to develop an original product that addresses the objective of the 2018 SPDC which is to: deliver an innovative food product that has been developed from the identification of a consumer need using insights. The identified need can be emotional, social or rational. The initial entry proposal must include an analysis of the approach, methods, research and thinking that was used to generate the insight around the consumer need, why this need is important, and how it is currently (largely) unmet. Entries must also describe and explain the features, functions and benefits of the new product and which consumer need/s they will address.



2017 SPDC finalist *Bugsy Laksa*.



2017 SPDC finalist *Gluten Free Banana-Choc Pikelets*

## 2018 STUDENT PRODUCT DEVELOPMENT KEY DATES:


<b>INITIAL ENTRY PROPOSALS DUE</b>	5.00pm Monday, 4 June 2018
<b>FINALISTS ANNOUNCED</b>	Tuesday, 19 June 2018
<b>PROOF OF CONCEPT DUE</b>	5.00pm Monday, 30 July 2018
<b>FINALIST PRESENTATIONS AND PRODUCT TESTING</b>	Monday, 11 September 2018
<b>2018 SPDC WINNERS ANNOUNCED</b>	Tuesday, 12 September 2018





*Justin Whitely talking to students at the 2018 Summer School.*

**2018 AIFST SUMMER SCHOOL**

The 2018 AIFST Summer School took place 21 – 23 February 2018 at Curtin University, Perth. It was a fantastic few days for all who attended. The program consisted of industry and academic talks, site tours to CBH Grains and D’Orsogna small goods, professional development and technical workshops and a networking BBQ. AIFST would like to thank all those who attended and spoke, in particular the staff at Curtin University who helped to organise the event, Associate Professor Vicky Solah, Dr Haelee Fenton, Dr Ranil Coorey and Associate Professor Stuart Johnson. A full review of the 2018 AIFST Summer School will be published in the next edition of *food australia*. 



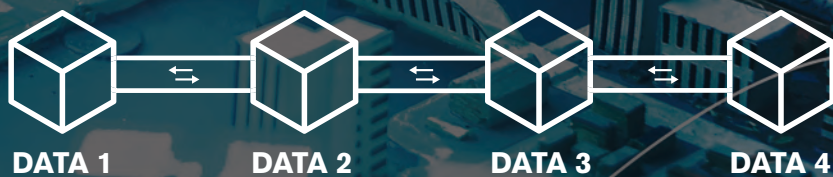
*Students on the CBH Grains Site tour.*



*Students learning about twin extruders.*



# WILL BLOCKCHAIN AFFECT THE FOOD INDUSTRY?



*There's more to blockchain than cryptocurrency and it could have big implications for the food industry.*

WORDS BY CHRIS PRESTON, LEGAL AND REGULATORY SPECIALIST





## WHAT IS BLOCK BLOCKCHAIN?

Blockchain is a way of structuring and recording transactional data in a way that is tamper-evident. The data for each transaction is stored in a 'block', and blocks are chained together in sequence – hence 'block' 'chain'.

This doesn't look that revolutionary, but the trick to blockchain lies in how the links between the blocks are structured by uniquely fingerprinting the data in each block.

At the core of blockchain is technology called 'hashing', which is in effect a digital fingerprint. It is an algorithm that encodes data (of any length whatsoever) into a fixed length string of 1s and 0s, called a hash. The hash has two key characteristics.

The first is while the same data will always produce the same hash, the likelihood of different data producing the same hash (technically called 'colliding') is negligibly small. Take a hash size of 256. You could generate one billion hashes per second for every single person on Earth, and do that for one thousand years, and you'd still have less than 1 per cent chance of a collision. Hashes are as close as you will get to a unique fingerprint for your data.

The second point is that any change in the data, however small, produces a radically different hash. Consider the following sentence:

The quick brown fox jumps over the lazy dog.

This produces a 256 bit hash that (converted to hexadecimal) looks like this ef537f25c895bfa782526529a9b63d97aa631564d5d789c2b765448c8635fb6c

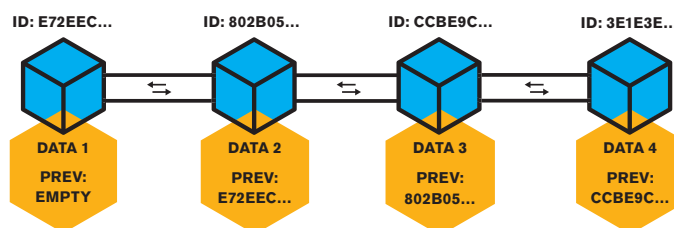
Now let's add a space between 'fox' and 'jumps':

The quick brown fox jumps over the lazy dog.

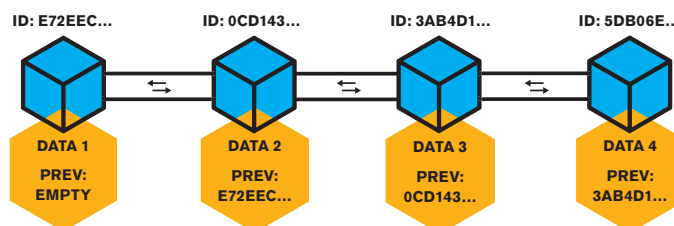
The hash now becomes very different – 2708334cb9d6e7fc083da38251b79928deb8c3c29313644d820f5ebc7ef95443

Blockchain's key characteristic is that it uses a hash of the block data as the block's identifier, and then makes the previous block's identifier part of the data of the next block – which means the previous block's hash is part of the information used to create the hash identifier of the current block. This inclusion of the previous block's ID is the factor that provides blockchain with its tamper-evident property.

Take, for example, the following blockchain, where the block id is a hash of the data in the orange box.



Now suppose there is a modification made to the second block in the chain, putting a space between "Data" and "2" – this could be due to a malicious hack or a simply data transmission error. Remember that a hash is highly sensitive to change, so block 2 now gets a radically different id, which gets reflected down the chain. The chain would now like this:



Now, if you know that the first chain is correct, you can tell that the second chain has an error simply by looking at the id of the last block in the chain! If the ID of that last block is not 3e1e3e..., then there is an error in the chain. Data integrity is therefore a very simple exercise. What is more, having identified that an error exists, you can then compare id's of the two chains block by block and identify exactly where the error (or hack) has been made – block 1 is okay because both chains have the id e72eec... but block 2 has the error because that is where there is a divergence in the block id – the second chain has id 0cd143... when it should be 802b05...

This ability to identify if, and where, data has been changed is the key advantage of blockchain. However, it critically depends on knowing what a 'correct' chain looks like, and various blockchain solutions approach this in different ways.

## USE OF BLOCKCHAINS

### CRYPTOCURRENCY

Famously, blockchains are used to record transactions for cryptocurrencies like Bitcoin. This is achieved by recording each transaction as a block in an ever-growing chain of ▶▶

transactions based on the currency. Each data block, for example, might identify the date and time of the transaction, the unique id of the coin being used, the unique id of the payer and the unique id of the recipient. The blockchain can then be used to reconstruct the history of each individual Bitcoin from its original issue (called 'mining') to the present time, as well as identify who holds which Bitcoins right now – making sure, for example, that coins are only spent once and are not forged.

In the case of Bitcoin, each transaction is sent simultaneously to an (increasing) number of independent registries, forming a community of chain holders. As any change in the data at any point in the chain shows up the hash of the last block, hacking just one registry and changing its data will mean that registry's last hash will differ from that of all the unhacked registries across the planet – meaning the change in data is easily detectable.

This is the concept of the shared ledger. A number of independent registries each hold all the data, and can compare the hash of the last block in the chain to form a community consensus as to what is the right hash. This makes fraud very difficult, as it would be necessary to hack every registry identically and simultaneously.

This security comes at a cost. The length of the blockchain is always growing, as is the number of registries, and so the data load is large and duplicated. Shared ledgers are actually quite inefficient in terms of data processing and storage, but the cost can be worth it to deliver assurance.

#### **AFGC'S PRODUCT INFORMATION FORM**

Blockchain has uses beyond shared ledgers. The current version of the AFGC's Product Information Form, PIF V6.0, will use blockchain technology for its message exchange protocol. This protocol can be thought of as being an envelope containing a letter. The PIF data is the letter, and a hash of the data forms the message id – in effect, part of the envelope's return address information. This means the recipient of a PIF message can quickly verify whether the hash of the PIF data received matches the message id, and is thus assured of the data integrity. Conversely, when the return address is used the PIF creator can quickly determine whether the data hash matches that which was originally sent – and so is assured that the data has not been hacked along the way. Each PIF message exchange is thus built on a short blockchain of sequential messages with a hash of the message data providing a means of ensuring data integrity.

#### **555**

A potential further use for blockchain lies in supply chain modelling, where transactions are blockchained as ingredients and products move through the system. Just like Bitcoin, such a system would be able to provide a complete history of a food from farm origin to retail shelf, and this might deliver solutions ranging from authenticity through to traceability. Unlike Bitcoin, there would not be a single blockchain stored universally by a number of independent registries, but each product would have its own blockchain, maintained by entities involved in the supply of just that product – thereby cutting down on the inefficiencies that plague cryptocurrency. Solutions based on this idea already exist.

#### **AUDIT CERTIFICATES**

A possible example of a shared ledger that may be of practical use to the food and grocery sector is in the authentication of safety audit certificates. In this case there could well be a shared community of registries (eg certificate issuers) that maintain blockchains of valid audit certificates not just from themselves but from other recognised certificate issuers. Any change in the content of a certificate would then show up as an invalid hash, and any forged certificate would simply not exist in the (searchable) chain of valid certificates. Such an approach could efficiently address problems in the use of the existing paper (or PDF) documents.

And why stop at audit certificates? The same principles might apply to any certification, ranging from anti-slavery commitments through to religious dietary certifications. The ability to authenticate certifications and reliably link certificates to products has great potential for product authenticity and overcome some issues with food fraud.

#### **THE FUTURE OF BLOCKCHAIN**

Blockchain provides an information technology that has inbuilt verification and tamper-evident properties. Like all IT solutions, it is not a panacea for every problem and it can be inefficient. The classic use of blockchain as a means to implement a shared ledger may have some application to the food and grocery sector, but there are other uses of blockchain that may also be useful, where the self-verification properties of blockchain can deliver outcomes of direct benefit in areas such as product information, product traceability and certification.®



# FSANZ UPDATE

*New breeding techniques, new premises  
and new applications.*

WORDS BY FOOD STANDARDS AUSTRALIA NEW ZEALAND

## **NEW BREEDING TECHNIQUES – FEEDBACK INVITED**

In February, we released a consultation paper seeking feedback on food derived from new breeding techniques (NBTs). The paper seeks your views on the definition of food produced using gene technology.

Since Standard 1.5.2 – Food produced using gene technology was first introduced in 1999, we have seen a range of new approaches developed in plant and animal breeding.

We have been monitoring these techniques for some time and consulted with a range of experts to fully understand them and how they apply to the current definition in the Code (including the need for pre-market safety assessment).

An expert advisory group has also been brought together to help us consider these issues and provide advice on the current science and potential food safety issues associated with NBTs.

At this stage, we are not proposing any changes to the current labelling and safety assessment requirements in the Code. This is about ensuring we have considered all legitimate issues and concerns before deciding if a proposal to change the Code is required.

Feedback is invited by 12 April 2018.

Have your say at [www.foodstandards.gov.au/newbreedingtechniques](http://www.foodstandards.gov.au/newbreedingtechniques).

## **NEW CANBERRA PREMISES**

Our Canberra staff officially moved into our new premises at 15 Lancaster Pl, Majura Park in January. The new space, located near the Canberra Airport, provides a refreshing and modern environment for staff and visitors. We look forward to welcoming stakeholders to our new building.

## **MANDATORY ALLERGEN LABELLING FOR LUPIN IS COMING**

Food businesses are reminded that mandatory allergen labelling of lupin comes into effect from 26 May 2018. If you sell products containing lupin as an ingredient, compound

ingredient, additive or processing aid you need to declare it on food labels from this date.

For more information visit [www.foodstandards.gov.au/lupin](http://www.foodstandards.gov.au/lupin).

## **CALLS FOR COMMENT**


Earlier this year we called for comment on the following applications and proposal.

The first application (A1144) seeks to create a new food additive category for coconut milk products. The Australian Food and Beverages Importers Association applied to change the Food Standards Code because of confusion about which food category coconut milk products fall into for food additive permissions.

Two other applications seek permission to allow the use of existing enzyme processing aids from new sources. The first application (A1153) seeks to use the enzyme, endo-1,4- $\beta$ -xylanase, from a genetically modified strain of *Trichoderma reesei*. The other application (A1151) seeks to use the enzyme,  $\beta$ -Galactosidase, to produce galacto-oligosaccharide (GOS) from lactose which will be used as an ingredient in various foods.

We also sought feedback on a proposal (M1015) to change maximum residue limits for some agricultural and veterinary chemicals. The proposed changes would align limits in the Food Standards Code with overseas limits, while others have been proposed by the Australian Pesticides and Veterinary Medicines Authority.

A decision on the above is expected to be made by the Board in June before being notified to the ministers responsible for food regulation.

You can find out more on our website [www.foodstandards.gov.au](http://www.foodstandards.gov.au) under 'Applications to change the Code' and 'Proposals to change the Code'. 



## WHY SHOULD LEGAL AND REGULATORY BE INVOLVED IN PRODUCT DEVELOPMENT?

*There are myriad benefits but they all contribute to one very good reason.*

WORDS BY CHRIS PRESTON, LEGAL AND REGULATORY SPECIALIST

**A**lrigh. One look at my job title will show my bias on this issue, but I can answer the headline question very simply: because it will save you precious R&D money.

Innovation, or the lack of it, is among the most mentioned issues when supermarkets, consumers, and government officials talk about the food industry. It is true that there are barriers to innovation, both regulatory and social, as well as corporate and commercial risk. But new product development remains key to gaining category market share, and so it is important to make every R&D dollar count.

The benefits of having legal staff involved in product development lie in the identification and protection of company intellectual property following on from R&D, the curation of any relevant company policies (whether relating to nutrition, social responsibility, sustainability or any other topic), and what I call finding the path to 'yes': the ability to steer claims development into territory where risks are acceptable, rather than having to say 'no' to claims that have been under development for 6 or 12 months but which cannot be progressed in the ANZ market.

The benefits of having regulatory staff involved in product development can also be identified quite readily. It is far easier to nip regulatory issues in the bud if they have been identified early in the process. Questions like allergen management and even ingredient legality, if identified at the start, can ensure that hard-won R&D funds are expended wisely on products that can be sold in the ANZ market, rather than products that cannot. Regulatory staff can also identify data needs to support mandatory labelling and product claims.

And this is particularly true when it comes to product claims. Australian laws, and the manner in which they are enforced by regulators in the ACCC, are among the toughest in the world. The ACCC's well known aphorism that 100 per cent means exactly that, and not 99.9 per cent, is a case in point. If new product innovation relies on claims that cannot be made in the ANZ market context, this must be identified early in the process –

either so that alternative, acceptable claims can be developed or so innovation budgets can be directed to other targets.

I cannot stress the point too highly: the ANZ market is different, and what is allowed in other jurisdictions may have significantly different risks in the ANZ context. These risks need to be identified and assessed, especially when looking at bringing to the ANZ market products that have been introduced overseas, even in comparable economies such as the UK, the USA or the EU. The health claims situation in the USA is radically different from the situation here, for example, because of the USA constitutional right to free speech. In contrast, Standard 1.2.7 to a large degree makes the ANZ food regulatory system the gatekeeper as to what claims may, or may not, be made.

I mentioned earlier that legal involvement in product development can help protect company intellectual property. There is a bewildering array of IP rights, ranging from designs, copyright, trade secrets, patents, trademarks and so forth – colours and scents can now be trademarked – and each has its own strengths and problems, and needs to be protected in its own, and in some cases highly specific, fashion. Despite the complexity, the protection of the IP derived from product innovation can be the key to a proper return on investment, and yet it is not always obvious that a new item of IP has been generated. Having someone in the development team attuned to this issue can be the difference between a company owning an outcome and it being in the public domain for competitors to use. Do not think of IP as being just about patents or secret processes – it can have a much wider application.

Modern business theory emphasises the role of collegiate multi-disciplinary approaches, and product development is a prime example where such an approach pays dividends in quickly closing off blind alleys, finding the path to 'yes' and maximising the IP return on each and every one of those precious R&D dollars.®



# INDUSTRY LAUNCHES FRAMEWORK FOR INNOVATIVE GROWTH IN SA

*Drawing on a research project spanning two years, South Australia now has a strategic framework for growth through innovation for the state's food and beverage industry.*

**WORDS BY LEE WELCH, FOOD SOUTH AUSTRALIA**

**L**aunched late last year, South Australian Food and Beverage: A Framework for Growth Through Innovation, was developed by Food South Australia, the state's peak industry body for the sector.

The South Australian agrifood industry is a significant contributor to the state's economy, generating \$17.6b in revenue (PIRSA Food Scorecard 2016-2017). The sector is envisioned to be one of the top economic priorities for sustained development and economic progress of South Australia, leveraging its competitive position in domestic and export markets.

The Framework for Growth Through Innovation provides agencies or organisations offering services and support to the sector, including businesses themselves and all levels of government, with an industry-led and evidence-based set of priorities for the development of programs and policy.

**COMPONENTS FOR GROWTH**

Four strategic themes are identified in the framework, based on the findings of a major research project undertaken by Food South Australia and the Centre for Global Food and Resources at the University of Adelaide in 2016/17.

The four themes are:

1. Facilitating opportunities for business and industry growth.
2. Growing skills and creating clear career paths for the food and beverage industry.
3. Co-operation to create an environment for successful collaboration.
4. Collaboration to facilitate innovative business models.

A number of opportunities and potential actions are outlined under each theme in the framework document, but rather than outlining a rigid plan, the framework has been designed to foster creative collaborations responding to the identified needs.

**THE GROWTH THROUGH INNOVATION STRATEGY RESEARCH PROJECT**

The research project and framework development were undertaken by Food South Australia over 2016/17 with funding support from Primary Industries and Regions SA.

In 2016, the Centre for Global Food and Resources of the University of Adelaide conducted a study of drivers and barriers of growth through innovation in the South Australian agrifood sector. Industry leaders, food and beverage businesses of all sizes, and food and beverage manufacturers and producers who are actively adding value at the farmgate were invited to participate.

A 'sectoral systems of innovation' (SSI) approach provided the research structure for the study, which was undertaken in three parts: a comprehensive online survey, in-depth interviews with award-winning food and beverage businesses, and an analysis phase using the SSI framework to analyse potential opportunities and actions for growth through innovation in the industry. The project also included workshops to facilitate feedback from regional food and beverage businesses and with industry leaders to obtain feedback on the findings of the analysis phase.

For the purpose of the research project and the development of the strategy, 'growth' was defined as increasing sales, expanding markets, improving profitability, and creating new jobs for the South Australian food and beverage industry.

'Innovation' was defined as including the process of solution-seeking as well as any outcome that resolves a constraint or enables uptake of an opportunity.

The research findings showed that although very few businesses perceive collaboration to be an innovative activity, knowledge sharing through informal networks exists and there is significant potential to develop inter-industry collaborative strategies to explore opportunities for innovation. Industry associations have been identified as key facilitators for exploring market opportunities, and for the provision of support and assistance, however, a lack of effective collaboration is having an impact on information sharing relevant to the exploration of new markets and identification of collective business opportunities.

The research findings highlighted some key strengths in the South Australian food and beverage industry, including the industry's capability to collaborate to adapt to fast-changing market conditions in ways that benefit the whole sector rather than just one business.

Food South Australia is an independent, industry-led and membership-based organisation representing food and beverage manufacturers, processors and producers based in the state. Food South Australia also develops and delivers industry-wide programs designed to grow industry capability, capacity, markets and connections in partnership with the government of South Australia. 



# INNOVATION IS THE FUTURE OF AUSTRALIAN FOOD

*How FIAL is taking Australian food businesses to the next level.*

WORDS BY FOOD INNOVATION AUSTRALIA LIMITED



**F**ood Innovation Australia Limited (FIAL) is a not-for-profit organisation funded by the federal government. Our vision is to grow the share of Australian food in the global marketplace. We are an industry-led initiative that works closely with food and agribusinesses around the country, focusing on sharing knowledge, building capabilities and creating connections. We equip businesses with the skills to increase their global competitiveness, productivity and point of difference.

FIAL inspires and motivates businesses by sharing knowledge. We share market information and technological insights so that businesses can make decisions based on relevant and credible information. We inspire businesses to take on new challenges and build their confidence by providing practical skills and capabilities, such as workshops delivered by industry experts. We are passionate about fostering innovation, so we connect businesses with researchers to encourage new developments in products and technology.

We are passionate about increasing our nation's competitiveness by helping companies develop new products and processes that set them apart. To achieve this, we are working to establish an environment that emboldens the industry to innovate by encouraging collaboration, risk-taking and creativity. For the past two years, FIAL has produced a book showcasing 50 Australian food and agribusinesses that have used innovation to solve a challenge – stay tuned for the next edition coming later this year. The Celebrating Australian Food and Agribusiness Innovations books have showcased many incredible innovative efforts such as Natural Evolution, a company that featured in our second edition, released in May 2017.

With the help of FIAL's Enterprise Solution Centre funding programme (ESCP), which promotes innovation and collaboration

between business and the research sector for small and medium enterprises, Natural Evolution created Nutrolock. This world-first technology was designed to solve the problem of wasted bananas in North Queensland by turning green bananas into starch or flour. This book gave Natural Evolution a chance to share their innovation with the industry, and co-founder Krista Watkins was "delighted to be featured in this book that recognises and celebrates businesses like ours that are pushing the boundaries of food innovation".

*Natural Evolution, established by Rob and his wife Krista, have produced innovative, nutritious and award-winning products with the help of FIAL's Enterprise Solution Centre funding programme.*

The food and agribusiness industry is highly fragmented and operates in a diverse and dynamic landscape. A pivotal goal of FIAL is to create connections between industry players, such as by connecting business to researchers. Many of our activities foster connections, such as ESCP, which has funded 70 key projects in addition to the work with Natural Evolution. Out of these businesses, 32 per cent engaged with a researcher





*Queensland farmer Rob Watkins discovered a way to stop wasting tonnes of Lady Finger bananas that were deemed not suitable for sale by creating green banana flour.*



for the first time, and a further 40 per cent have gone on to repeatedly engage with a researcher to help them solve technical challenges. FIAL will continue to create platforms and programmes to create connections, build trust and encourage greater sharing of knowledge across the industry.

FIAL also recognises that the famous Aussie spirit of hard work, which is fundamental to the industry, cannot by itself sustain us indefinitely. For this reason, many of FIAL's activities are dedicated to building the capability of the industry by giving people the confidence and capacity to develop innovative, cost-effective and differentiated products that meet the needs of the customer. We do this through workshops and courses, such as Fast 'n' Furious, a short course that gives participants an introduction to innovation and its role in an ever-changing marketplace. Fast 'n' Furious teaches participants to use innovation and customer insights to solve a specific challenge, and works with them to design an action plan to develop a Minimum Viable Product within six months of completing the course.

Most businesses know that innovation is key to producing the opportunities and efficiencies that will ensure the sustainability of their business. Our Fast 'n' Furious course revealed that 33.3 per cent of participants needed help with their innovation

strategy, and some companies, such as Seven Sheds, completely changed their business model after the course. Seven Sheds went into the Fast 'n' Furious course lacking inspiration and feeling competitive pressures, and came out of the course realising that they had been sitting on a product they had undersold for years: mead. Following the course, Seven Sheds doubled their mead revenue by positioning the product as 'the drink that time forgot', and had a new understanding of the synergy between innovation and business development.

Seven Sheds and Natural Evolution are just two of the many companies that FIAL has assisted since 2013, and we aren't stopping anytime soon. Through our industry-led activities and programmes we hope to reach many more companies, and to help the Australian food and agribusiness collaborate and grow so that Australian products an impact both in Australia and overseas.

Should you, or your business, want to find out more about innovation funding and support please contact [info@fial.com.au](mailto:info@fial.com.au). We have worked with over 500 businesses and seen amazing results – let us work with you today! 🍌

*For more information on how FIAL can help your business grow, please visit [www.fial.com.au](http://www.fial.com.au).*

# TOP NEW 6 INNOVATIVE FOOD TECHNOLOGIES

*The future is here with these amazing, cutting-edge food processing technologies developed by CSIRO.*

WORDS BY PAMELA TYERS AND IMOGEN BROWN, CSIRO

**C**SIRO is excited to share its top six new innovative food processing technologies. A combination of enhanced and brand new, these technologies are all designed not only to create value for Australian food companies, but also to help generate new, safe and great tasting foods while maintaining many of the natural characteristics that consumers expect.

## 1. SHOCKWAVE

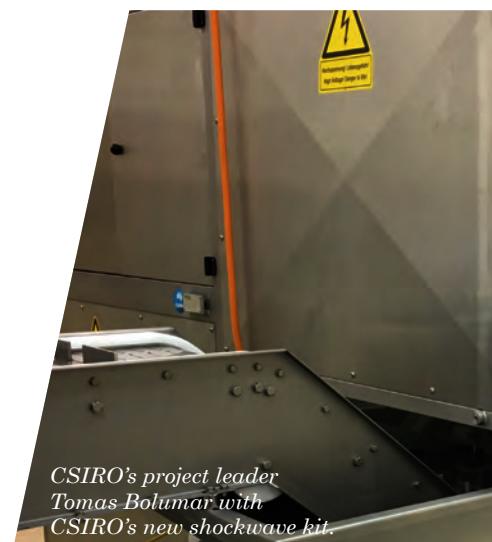
Based on pulses of acoustic pressure, shockwaves can be generated either by detonating explosives (as did the first system of this type developed during the 90s) or electrical discharges underwater. The new shockwave kit uses the latter method to tenderise lower-value meat cuts and other foods.

Once the shockwaves are transmitted, they hit a material with different acoustic properties to water. The resulting mechanical stress disrupts the structure of the food. This process can also enhance the extraction of bioactives from plant materials and modify grain structures to improve milling yield. CSIRO's Food Innovation Centre has one of the very few commercial-scale shockwave machines in the world.

## 2. FORWARD OSMOSIS TECHNOLOGY

Many foods and beverages, including fruit juices, milk and other dairy products, go through a concentration step during manufacturing. This makes them last long enough to be shipped and stored or used as an ingredient in another product. However, heat and vacuum typically applied in this concentration step can reduce the quality of some food and beverage products and also uses a lot of energy.

CSIRO teamed up with the US-based membrane technology specialist company, Porifera, to develop a relatively new technology, forward osmosis, which uses membranes to concentrate liquids. This technology is considerably gentler and uses less energy than conventional concentration technologies. Forward osmosis doesn't use heat; therefore, proteins remain intact and components such as vitamins, flavours and aromas are retained, meaning food products have better quality attributes. CSIRO also has the first commercial unit for the Australian food industry at their Food Innovation Centre.



*CSIRO's project leader Tomas Bolumar with CSIRO's new shockwave kit.*



*Antenna microwave technology.*

## 3. ULTRASOUND TECHNOLOGY

Previously, CSIRO investigated using ultrasound technology to develop applications in de-foaming, food texturisation and extraction of bio-products. Now they have patented the world's first ultrasonic oil separation application at commercial scale. It uses cutting-edge sound waves at the megahertz scale. It helps the industry to extract more oil from processing edible oils such as olive, coconut and palm oil.

## 4. SUPER DRY TECH

Drying to preserve seasonal foods or foods with a short shelf-life is an effective way of providing food and its nutrients all year round. Drying is a significant global industry – many foods come from this industry: dried fruit and vegetables, coffee, powdered foods and pasta. Drying is an energy-intensive process because it uses high temperatures and/or long drying times, which can result in thermal damage of the food and inferior product quality.

CSIRO is developing a superb drying technology that uses ultrasound waves, low temperatures and reduced drying times to





*CSIRO's 'Meals By Design' are being commercialised using high pressure thermal processing.*

*Photos courtesy of CSIRO.*

dry food products far more gently with less energy. It's still at the research stage and not yet used commercially, but the results are showing better product quality such as retention of antioxidants, vitamin C and other nutritional components in many foods.

### 5. HIGH PRESSURE THERMAL PROCESSING

Although pasteurising food using high temperatures makes it safe to eat, it can change the natural taste, colour, texture and nutritional value of the food.


CSIRO researchers have looked into high pressure processing with added heat, called high pressure thermal processing (HPTP), and invented a world-first innovation – a canister that allows the use of mild heat to existing high pressure processing machines. This innovation is suitable for making certain products microbiologically safe using far less heat compared to conventional food pasteurisation technologies.

CSIRO is currently in the process of commercialising their 'Meals By Design' innovation, which has the colour, texture and

taste characteristics of a freshly prepared meal using the HPTP technology. The CSIRO Food Innovation Centre features one of only very few pilot-scale, HPTP machines in the world.

CSIRO's 'Meals By Design' are being commercialised using high pressure thermal processing.

### 6. ANTENNA MICROWAVE

Conventional microwave systems, such as those found in a home, heat food unevenly. However, that's not much of a problem from a food safety perspective because the food is usually eaten immediately. The problem with uneven cooking for commercial food products that are transported and stored is that microorganisms may still lurk in the less cooked parts, and they may multiply with time. CSIRO has invented a microwave technology that heats food evenly. It could potentially be used for food pasteurisation and other applications where even heating is required. 

# THE ROLE OF SENSORY RESEARCH IN AUSTRALIAN FOOD INNOVATION

*From understanding how to make palatable, nutritious food for soldiers to identifying generational differences in palate, sensory research is an intriguing science.*

WORDS BY DR DENISE HAMBLIN, COLMAR BRUNTON

Sensory research is a unique science that delves into how our senses connect to and interpret the environment and stimuli within it. But how useful has it been for food and beverage innovation in Australia? And can a discipline so steeped in empirical rigour survive in an industry of ever-increasing levels of creativity and speed?

To contemplate the future, it is often useful to understand the past. And sensory research's past began with its commercialisation in the 1930s with industrialisation of food production. In the 1940s, it helped us understand how to make nutritious meals for soldiers palatable. Since then, the sensory evaluation of food and beverages evolved into a discipline within food science drawing from physiology, psychology and psychophysics.

It was a discipline that soon established itself into all parts of the FMCG innovation pipeline, but as competition within the industry intensified, sensory research had to evolve – acceptability plus profiling by everyday consumers, rapid techniques with expert panels, understanding trends via longitudinal data, and testing in foreign markets began to emerge.

The magic of consumer and expert sensory research could be seen in the impact of colour on perceived flavour strength, of music on product choice, of temperature on product preference and of aroma on product acceptability. Size of serves, the colour of crockery and firmness of texture began to show us the

influence of perception on the sensory experience and volume consumed, revealing the power of sensory research in unlocking innovation that could lead to healthier levels of consumption.

With more data available, we began to understand the thresholds, preference points and differences between the ideal sensory experience for children and adults. For example, millennials show a preference for natural colours, stronger top notes in aroma, crisper initial textures, higher levels of heat, lower preference for salt and sweetness, and a higher preference for complexity via umami and stronger character via aftertaste. This is a significant challenge for innovation, particularly for mass produced products that can tend towards blander profiles with broad appeal.

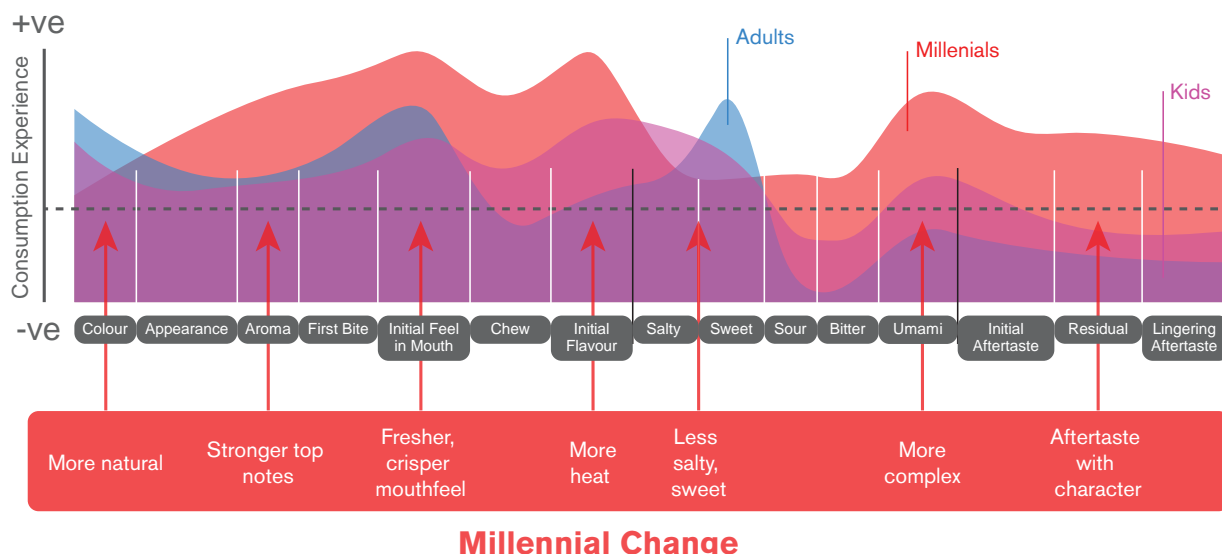
Generational differences are interesting, but they also reveal the average Aussie palate – one influenced by the salty, bitter umami flavour of Vegemite, the sourness of our butter, the crispness of wheat-based snacks, the savoury flavour of well-cooked red meat and a preference for a sweetness level inherent in locally grown fruit. This type of profiling has been imperative to successful innovation for the Australian market and for international manufacturers designing products for us.

For feasible, viable and desirable exports, sensory research has future-proofed home-grown innovations. It has informed manufacturers that Chinese consumers are incredibly sensitive to texture and prefer different levels of sweetness, saltiness and spiciness based on region. It has informed manufacturers about the importance of lubrication in the American market, of avoiding artificial aftertastes in the New Zealand market, of texture in the Thai market and of sweet/sour balance in the Indonesian market.

Finally, sensory research has informed product developers what drives acceptability in a category at any point in time. Specifically, it has allowed us to translate what moreishness, craving, refreshment and pure indulgence means so we can better enhance these experiences. This is relevant not just for packaged goods manufacturers, but also for primary industries who now find themselves competing on occasion.

Sensory research is critical for Australian innovation and Just imagine what more we'll learn as the discipline continues to evolve, enabling breakthrough product development and tracking changes in palate preferences both here and beyond.®

*Dr Denise Hamblin is the National FMCG Sector Head at Colmar Brunton.*





With almost 30 years experience in FMCG innovation and multiple experts located around the country, you'd be forgiven if you thought we only specialised in best practice sensory, trained panel profiling and volume estimations for first year in market.



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MAPPING**



**CONSUMPTION  
TRACKING**

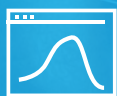


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## INNOVATION BRINGS VITAL ALLERGEN CALCULATOR TO WORLD STAGE

*World leading online allergen calculator, VITAL Online, is an inspiring example of the way the entire food industry can come together in the interests of consumers.*

### WORDS BY THE ALLERGEN BUREAU AND FIAL

**T**he web-based tool VITAL® Online was brought to fruition under the auspices of the Allergen Bureau, thanks to a combination of rigorous scientific input and the cooperation along the entire food chain by national and multi-national food companies, suppliers, importers, exporters, retailers and consumer groups, along with FIAL's financial and specialist intellectual support.

"The VITAL (Voluntary Incidental Trace Allergen Labelling) Program is a standardised allergen risk assessment procedure that produces a 'labelling outcome' summarising the allergens that are present or may be present in a food, whether their inclusion is intentional or inadvertent, due to cross contact," explains Tom Lewis, Allergen Bureau Chief Executive.

"What is now the VITAL Online calculator started life as a spreadsheet, available for download by the industry. But as it became more used and accepted, we realised we didn't

have as much control over the information as we needed – we couldn't update static spreadsheets when there were changes in regulations or when new science was available to improve the information we were sharing."

Transforming the spreadsheet-based resourced into an online calculator seemed the ideal solution. While significant advances in technology put the practicalities of creating a reliable calculator within reach, there remained a gap when it came to the resourcing of such a big project.

"Frankly, a lot of industry counterparts overseas said it couldn't be done," says Tom. "Buoyed by its years of industry support, the Allergen Bureau and its supporters remained undeterred, and Tom decided to approach FIAL.

"I'd dealt with FIAL in my other food industry roles and thought they had the right mindset and people to understand the concept and its benefits, and to appreciate and contribute to the genuine innovation aspect – after all, we were looking at creating a world first," he explains.

When FIAL's General Manager of Innovation, Barry McGookin took the call, he was already aware of the VITAL Calculator spreadsheet. "We knew that the VITAL calculator and the Allergen Bureau itself already had wide industry acceptance and immediately saw the chance to help food organisations by making VITAL more accessible and helping to increase its uptake," says Barry.

"Of equal interest to us was supporting an Australian capability that could be leveraged by international bodies in the industry," says Barry. "Part of FIAL's remit is to connect knowledge and

*Reaction from industry has remained very strong, with thousands of calculations carried out by industry over the two years since launch.*

capabilities and VITAL gave us the opportunity to help the Allergen Bureau do exactly that, on a potentially worldwide scale."

From those initial talks, the journey to bring VITAL Online to fruition began.

Far from "never making it", VITAL Online has been a consistent winner on the Australian and international food stage. "Reaction from industry has remained very strong, with thousands of calculations carried out by industry over the two years since launch. Every week we're getting contacts, free trial sign-ups and subscriptions, with more and more European and other internationals taking it up," says Tom. "Our goal is to have VITAL Online set the world standard".

"It's an evolution, and we are gaining more and more attention. People are not only agreeing that this is the way to go, what's even more important is they're agreeing that we should unite all of our resources behind it for the good of the industry. And it has been immensely valuable to have FIAL by our side help us achieve this." ©



# AUSTRALIA 2030: PROSPERITY THROUGH INNOVATION

*A plan for Australia to thrive in  
the global innovation race.*

**WORDS BY OFFICE OF INNOVATION  
AND SCIENCE AUSTRALIA**



## ISA'S VISION FOR 2030

Innovation and Science Australia's (ISA) vision for 2030 is that Australia will be counted within the top tier of innovation nations.

*"We will take pride in our global reputation for excellence in research, science and commercialisation. Our world leading strengths in innovation, science and research will benefit all Australians through: strong economic growth; competitive industries and companies, and collaborative education and knowledge institutions; plentiful jobs that are meaningful and productive, and a fair and inclusive society with a high quality of life."*

## FIVE IMPERATIVES FOR ACTION

The 2030 Plan makes 30 recommendations to the Australian Government, actionable within five core policy imperatives for education, industry, Government, research and development, and culture and ambition. Within these imperatives, the 2030 Plan describes specific opportunities where governments can exercise leadership and influence to accelerate Australia's performance by 2030.

## THE 2030 PLAN: A ROADMAP FOR ACTION

The recommendations in the 2030 Plan focus on how governments can contribute to the effective functioning of Australia's innovation system. This includes actions to regulate

and shape the system more effectively, actions to be a stronger customer and catalyst for innovation in the system, and investments that support critical enabling activities that would not occur at all, or as effectively, without government support.

The aim of the 2030 Plan is to use strategic activity and investment by governments to trigger significant increases in funding for R&D from other sources. Government investment in R&D is projected to rise modestly from 0.62% to approximately 0.69% of GDP by 2030, whilst Business investment is projected to rise from 1% to approximately 1.7% of GDP.

Successful implementation of the Plan will require focused attention from Government, and an effective mechanism for coordination across the whole of the Australian Government.


## WHAT DOES THE 2030 PLAN MEAN FOR THE FOOD AND AGRIBUSINESS SECTOR?

One of the themes of ISA's 2030 Plan is that innovation has the potential to transform existing industries, not just create new ones, and AgTech is no exception. ISA see opportunities such as the use of drones and positioning technology to drive every greater precision in on-farm agriculture, as well as the use of technologies like blockchain to underpin confidence in provenance of food throughout the supply chain.

AgTech start-ups can demonstrate the high growth Australia needs across the economy. One of the recommendations in ISA's 2030 Plan (Recommendation 6) advocates more direct support of business R&D to allow focus on areas of competitive strength or strategic priority. Commonwealth programs already supporting priority areas include; the CRC program (CRCs and CRC-Projects), Entrepreneurs' programme and Industry Growth Centres like FIAL.

Further, ISA's review of the R&D system found that the model of co-investment by Government and producers through Rural Research and Development Corporations (RCDs) had broadly served the agricultural innovation system well. However, a key challenge that was identified by ISA through consultation with the rural sector was the need to continue to develop translational capability. To this end, ISA is encouraged by the emergence of initiatives such as SproutX and cicada's Growlab, as well as the Government-funded Food and Agribusiness Growth Centre FIAL – each of these brings a valuable new approach to supporting Agtech innovation.

ISA also sees instances like Horticulture Innovation Australia's Hort Frontiers and Meat and Livestock Australia's Meat Donor Company where voluntary partner contributions are matched by Australian Government dollars to encourage producer-grower collaboration, as areas that benefit the entire sector.

Looking to the future, in accord with the recommendations of the 2030 Plan, ISA would like to see the Government providing further support for business R&D through more direct rather than indirect mechanisms, as well as continued support for collaboration and translation activities that link Australia's research base with end users. ISA also believes the Plan's recommendations relating to workforce development, and in particular a review of the Vocational Education and Training (VET) system, will have great importance for the Agtech sector. 

# WHAT DOES THE AGEING POPULATION MEAN FOR THE FOOD INDUSTRY?

*Nutritious food that contributes to good health and independence will be key to the world's fastest growing demographic.*

WORDS BY SARAH HYLAND, AIFST

As life expectancy increases, older population groups will be the fastest growing demographic globally. Indeed, the fastest growing consumer segment is people aged over 60. Globally, this consumer segment is set to reach 13 per cent by 2020, and here in Australia it's already at 16 per cent.

From an historical perspective, this group have never been fitter and healthier and, on balance, have the longest projected life expectancy. Only seven per cent of our aged population are in nursing homes – the rest of our over 60s are living independently, are active, are in reasonable health and are often still employed.

Companies interested in targeting this group segment the market in different ways, but the most common is chronological age. However, it may be that there is no such thing as a single 'older consumer'. Some argue that chronological age is a poor tool for segmenting the population and there is research that indicates that age has little impact on consumer demand if income is taken into account.

Understanding this significant market is a key determinant of effective mid-term and broader horizon NPD strategy and the investment required for the development of food, beverage and packaging for the ageing population.

Generally speaking, members of the older demographic seek products that offer current and preventative health benefits that may prolong the quality of an independent life. The food industry clearly has an important role to play during this critical era of people's lives.

Healthy ageing and the prevention of chronic disease is chiefly dependent on proper nutrition. However, the provision of

products that speak to the sensory, social and physical changes associated with ageing can help improve the mental health and length of independence – so overall quality of life – of older adults.

## OLDER PEOPLE HAVE DIFFERENT NUTRITION NEEDS


Human nutritional requirements differ across life stage from birth to the senior years. The key nutritional need states for seniors include bone and joint health, muscle health, heart health, cognitive health, digestive health, weight and diabetes, immunity health and malnutrition.

This means that the nutrition communication we see in mainstream media for low-fat, low-sugar, low-carbohydrate foods and diets, may not necessarily be suitable for the ageing consumer. Primary Industries and Resources South Australia (PIRSA) reports that research findings indicate that fat and sugar in moderation may provide health benefits for people over 65.

Sarcopenia is a serious disease associated with the ageing process. Loss of muscle mass and strength, which in turn affects balance and gait are signs of this disease. It is a significant risk factor for disability in the ageing population. When patients suffer from both sarcopenia and osteoporosis, the risk of falling and subsequent fracture incidence is higher. This clearly impacts on the independence of the ageing adult. It is incredibly important to provide foods with a good source of protein with every meal – even distribution of protein throughout the day is ideal for muscle synthesis.

Significantly higher levels of protein are required to maintain good health as we age. ProPortion Foods here in Australia make





SmartServe, a range of soft textured dairy desserts that are high in protein. They feature 10 flavours and packaging that has been designed and tested to make it easy to open with minimal effort.

While age is the strongest risk factor for dementia, Alzheimer's Disease is actually not considered to be a normal part of ageing. The adoption and maintenance of a healthy lifestyle can reduce the free radical damage to brain cells that is thought to contribute to cognitive decline. Nutrients including omega 3 fatty acids, which can reduce inflammation and oxidation in the brain, may be a way to address cognition. Choline is another nutrient that is thought to help prevent age-related cognitive decline.

#### **AS WE AGE, SO DO OUR TASTE BUDS!**

While the importance of nutrition increases as we age, our taste acuity falls away. The aging process leads to decreased sensory perception across the board, including smell, taste, vision and textural sensitivity. Creating flavorful, nutritious food that older adults actually want to eat and can continue to enjoy can be difficult.

"Aging populations rely heavily on prescription medication and more than 250 medications affect smell and/or taste," says Annette Hottenstein, MS, RD, LDN, a sensory scientist and president of The Food Sommelier. "With ageing, the ability to taste salty and sweet decline more rapidly than for sour and bitter. That is why many older adults crave sweet and salty foods. The challenge lies in finding the balance between health and taste."

Hottenstein adds: "More than 75 per cent of people over the age of 80 have major olfactory impairment. This is not a small problem by any means, and it greatly affects quality of life."

Nostalgia also plays an important role in food choices among senior consumers. As we age, we prefer foods that are familiar and provide important links to happiness and satisfaction on an emotional level. Messing with the flavour profile of a great traditional recipe may lessen your chances of successful sales.

#### **CATERING TO PHYSICAL NEEDS**

Swallowing difficulty (dysphagia) is also associated with ageing. In fact, it has been estimated that as many as 20 per cent of individuals over the age of 50 years, and most individuals by the age of 80 years, experience some degree of swallowing difficulty. As such, textural considerations are paramount when developing food for this group.

In Japan, where 26 per cent of the population is over 65, engay food has been developed for restaurant use. Engay is Japanese for "swallowing" – more Japanese now die each year from choking than in traffic accidents.

Japan's Nutri Co. use a gelling agent called Softia G that allows cooked pureed food to be modified into something resembling its original form but with a texture that is easier to swallow. For example, cooked blended salmon can be treated with SoftiaG, moulded back into the shape of a fillet and then 'grill' marks added with a propane torch. The result is salmon that looks like it was plated in a restaurant and almost tastes that way, minus the flaky texture.

The technique has been applied to numerous foods, from dumplings to mochi cakes. It is very popular on cooking blogs and has its own cookbook and cooking contest.

Also in Japan, baby-food maker Kewpie released a 50 SKU 'gentle' range, aimed at older adults. The vacuum-packed food pouches are helpfully labeled by texture, such as 'no chew', 'crushable with tongue', 'crushable with gums' and 'easy to chew'.

#### **INDEPENDENCE AND HEALTH**

While ageing is often associated with isolation and loneliness, older adults do seek products to maintain the independence they have enjoyed for most of their lives. A recent American Association of Retired Persons (AARP) Foundation study report, 50+ Consumer Survey Highlights: Healthy Living and Diet Perceptions, Food Purchasing and Consumption, demonstrated 'the desire to be healthy' as a top food choice value. Respondents in the study defined 'healthy' as maintenance of physical abilities and avoiding illnesses. The report also showed that indicators of health shift across the lifespan. As age increases, independence is more valued as a health marker than a healthy weight.

To further facilitate independence, many older adults will continue to rely on foods that are both convenient and simple to prepare. Manufacturers can assist through portion control and smart packaging. "Easy-to-open, resealable and easy-grip pack is a key purchasing factor," said John Ruff, retired Kraft executive and past president of the Institute of Food Technologists (IFT), in an interview. "Older adults do not want to be reminded that they are old. Products stereotyped to this consumer are being left on the shelf."

#### **NECESSITY IS THE MOTHER OF INVENTION**

Compared to the US and Australia, services for older adult populations in many other countries matured earlier. Indeed, marketers in Japan, Germany and Finland provide numerous examples of how food companies can address the needs of older adults.

As food technologists and scientists, we need to be mindful of developing products and communicating messaging with this group in a way that is appealing, respectful, and not defined by age. Indeed, many senior consumers feel much younger than their actual age.

It must be understood that consumers in this group generally want to feel less vulnerable when it comes to health and want more vitality. The overall objective of servicing the 80 plus consumer group is to add life to their years, not years to their lives. 🍷

*Sarah Hyland is AIFST's General Manager of Industry Services. If you are interested in learning more about trends in food and nutrition, please contact Sarah on 0447 066 324 or email: sarah.hyland@aifst.com.au.*



# THE GLYCAEMIC INDEX OF FOODS

## DRIVING INNOVATION AND NEW MARKET OPPORTUNITIES

*The classification system for carbohydrates based on their actual physiological effects in the body has stood the test of time.*

**WORDS BY PROFESSOR JENNIE BRAND-MILLER,  
DR FIONA ATKINSON AND KATHY USIC**

**T**he positive and negative health effects of dietary carbohydrates are relevant to consumers, the food industry and researchers. Even today, both carbohydrate quantity and quality for optimal health remain controversial. In this article, we focus on just one aspect of carbohydrate quality – the glycaemic index (GI) of foods.

First defined by Jenkins et al. in 1981, GI is a ranking of foods according to the potential of 50g (or 25g) of available carbohydrate from that food to raise blood glucose relative to 50g (or 25g) of glucose (Figure 1). On a scale 0-100, a score of 100 indicates the same impact as a glucose solution. After nearly four decades, the GI of foods shows no sign of disappearing. Indeed, over 6,500 scientific papers with the words glyc(a)emic index in the title, abstract or keywords have been published in that timeframe.

Historically, carbohydrates were classified only on the basis of their chemical structure into two categories: complex carbohydrates and simple sugars. Complex carbohydrates, such as starch and cellulose in bread and potatoes, were believed to be digested and absorbed slowly in the body resulting in a gradual rise in postprandial blood glucose. Conversely, simple sugars, such as table sugar and those in fruit, were thought to cause a rapid rise in glycemic response.

However, in the early 1980s, a new classification system for carbohydrates based on their actual physiological effects in the body was proposed. Jenkins and colleagues were responsible for the first comprehensive ranking of different carbohydrate-containing foods according to their postprandial glycemic response. The aim at the time was to assist in the prevention and treatment of diabetes, but the GI has since been widely applied to prevention of chronic diseases, maternal nutrition, cognition, and sports performance.

Today, low GI foods are classified as those that are more slowly digested and absorbed, or contain sugars (eg fructose or lactose) that are intrinsically less glycaemic. In contrast, high GI foods produce a more rapid rise in glycemia and larger overall blood glucose response. Notably the GI of a food cannot be predicted on the basis of its nutrient composition or ingredients (Table 1). Processing, cooking, additional ingredients and other factors (eg water content, fat, protein, fibre, acids), profoundly influence the glycemic response to a given food.

In 2013, an international group of researchers created the International Carbohydrate Quality Consortium (ICQC) with a view to creating consensus, resolving conflict and identifying



and 'glycemic responses'. The outcome was a scientific consensus statement which recognised the importance of postprandial glycemia in overall health, and the GI as a valid and reproducible method of classifying carbohydrate foods for this purpose. There was consensus that low GI and low GL diets were relevant to the treatment of diabetes and coronary heart disease, and possibly obesity. The group affirmed that low GI and GL diets should always be considered in the context of a healthy diet, complementing other ways of characterising carbohydrate foods, such as fibre and whole grain content. Low GI and GL diets were considered particularly important in individuals with insulin resistance. Given the high prevalence of diabetes and pre-diabetes worldwide and the consistency of the scientific evidence reviewed, the expert panel confirmed the urgent need to communicate information on GI/GL to the general public and health professionals, through channels such as national dietary guidelines, food composition tables and food labels.

#### PRECISION OF THE GLYCEMIC INDEX VALUE

The accuracy and reliability of GI values determined around the world are clearly important for the use of GI as a nutritional tool to guide food choices and its integration into dietary guidelines. The reproducibility of the methodology used for GI determination has been the subject of debate and a need to standardise the measurement of GI values has been acknowledged. Some of the key concerns relate to the determination of 'available' carbohydrate and the variability and reproducibility of results. Researchers have endeavoured to address these concerns through studies to investigate sources of variability in GI measurement between testing groups around the world. In 2010, an International Standards Organisation (ISO) methodology for determining the GI values of foods and beverages was published. The ISO Standard is designed to provide a recognised, standardised methodology for measuring the GI of foods. This Standard explains and discusses the ISO methodology to determine the GI of foods and beverages as well as factors that influence the GI.

#### GI LABELLING

In order to help consumers manage their weight and reduce their risk of chronic disease, provision of information about GI and/or GL on the labels of foods and drinks is warranted if regulated effectively. Like all nutrition information and associated claims, care must be taken to ensure consumers are able to use the information provided to make all-round healthy choices.

Food Standards Australia New Zealand (FSANZ) allows food products to show the numeric value of the GI or GL, provided the number has been determined by the

recognised scientific method. Foods may be labelled as 'low-GI' if the numerical value of the GI of the food is 55 or below (Table 2).

Food and beverage products must meet the Nutrient Profile Scoring Criterion (NPSC), a complex algorithm that takes into account the food group (three broad categories of beverages; fats, oils and spreads; and all other foods), energy density, saturated fat, total sugars, sodium, protein, fibre, fruits, vegetables, nuts, and legume content of the product. Its intention is to ensure that higher level nutrition claims are able to be made on healthy foods and beverages only.

Standard 1.2.7 also lists GL as a permitted nutrition content claim on foods and beverages sold in Australia and New Zealand. Like GI claims, foods and drinks must meet FSANZ NPSC before they are eligible to make GL claims. Unlike GI, low, medium or high GL are not defined within Standard 1.2.7, so, in theory manufacturers can claim a food is low GL regardless of its value. However, in practice, all claims on food labels must be evidence based and food authorities within Australia and New Zealand can request manufacturers to substantiate claims that a food has a low GL. Guidelines as to what constitutes a low GL food or beverage have been published.

#### THE GI SYMBOL PROGRAM

To make healthy choices easy choices, the Glycemic Index Foundation, a not-for-profit health promotion charity part owned by the University of Sydney and Diabetes NSW ACT (Australia), launched the GI Symbol ([www.gisymbol.com](http://www.gisymbol.com)), a world first front-of-pack labelling scheme. It is registered as a Certification Trademark (CTM) in Australia-New Zealand, North America, the EU, and Asian nations (Figure 2).

To use the CTM (GI Symbol), foods must be low GI according to ISO 26642:2010 and also meet stringent nutrient criteria for kilojoules/calories, carbohydrate, saturated fat, sodium, and in certain foods, fibre and calcium. Nutrient criteria are in line with international dietary guidelines. As an example, the criteria for breads and crisp breads: ►►

NUTRIENT	CRITERION
<b>CARBOHYDRATE:</b>	Contains at least 10g per serve but no more than 45 g per serve
<b>FAT:</b>	≤ 15 g/100g, provided that saturated fat is ≤ 5 g/100 g
<b>DIETARY FIBRE:</b>	3 g/100 g or more
<b>SODIUM:</b>	450 mg /100 g or less



**TABLE 1.**

Glycemic index (GI) values of common carbohydrate foods. Data are average results from available values listed in the International Tables of GI and GL adapted from Atkinson et al (2008).

HIGH CARBOHYDRATE FOODS		BREAKFAST CEREALS		FRUIT & FRUIT PRODUCTS	
White wheat bread	75	Cornflakes	81	Apple	36
Wholemeal bread	74	Wheat flake biscuits	69	Orange	43
Specialty grain bread	53	Porridge, rolled oats	55	Banana	51
Unleavened wheat bread	70	Instant oat porridge	79	Pineapple	59
Wheat roti	62	Rice porridge	78	Watermelon	76
Chapatti	52	Muesli	57	Dates	42
Corn tortilla	46			Peaches, canned	43
White rice, boiled	73	VEGETABLES		Strawberry jam/jelly	49
Brown rice, boiled	68	Potato, boiled	78	Apple juice	41
Barley	28	Potato, instant mash	87	Orange juice	50
Sweet corn	52	Potato, French fries	63		
Spaghetti, white	49	Carrots, boiled	39	SUGARS	
Spaghetti, wholemeal	48	Sweet potato, boiled	63	Fructose	15
Rice noodles	53	Pumpkin, boiled	64	Sucrose	65
Couscous	65			Glucose	103
				Honey	61
DAIRY PRODUCTS & ALTERNATIVES		LEGUMES			
Milk, full fat	39	Chickpeas	28	SNACK PRODUCTS	
Ice cream	51	Kidney beans	24	Chocolate	40
Yoghurt, fruit	41	Lentils	32	Potato crisps	56
Soy milk	34	Soya beans	16	Soft drink/soda	59
Rice milk	86			Rice crackers/crisps	87

**TABLE 2.**

Classification of GI values, reproduced/adapted from Standard 1.2.7 – Nutrient, Health and Related Claims

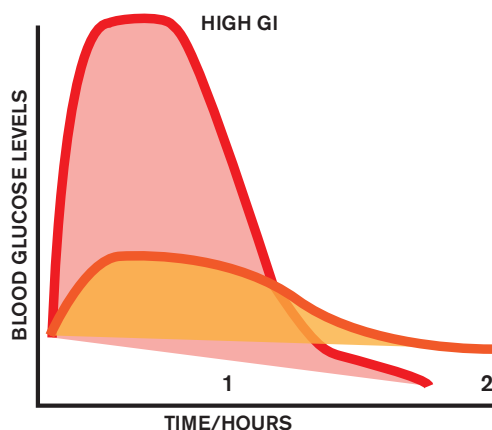
GLYCAEMIC INDEX		(a) the food meets the NPSC*, unless the food is a food standardised by Part 2.9 of the [Food Standards] Code; and  (b) the claim or the nutrition information panel under Standard 1.2.8 includes the numerical value of the glycaemic index of the food.
	<b>LOW</b>	The numerical value of the glycaemic index of the food is 55 or below.
	<b>MEDIUM</b>	The numerical value of the glycaemic index of the food is at least 56 and not exceeding 69.
	<b>HIGH</b>	The numerical value of the glycaemic index of the food is 70 or above.

\*Nutrient Profile Scoring Criterion



**FIGURE 1.**

High and low glycemic response curves



**FIGURE 2.**


The certified GI Symbol trademark



Food modelling by the Glycemic Index Foundation has demonstrated that the GI Symbol Program's Product Eligibility and Nutrient Criteria correlate very strongly with FSANZ's NPSC.

The GI Symbol was launched in Australia in 2002. Prior to the launch, market research was conducted in Australia by Newspoll. In 2002, 28 per cent of respondents (n=490) were aware of the GI. This increased to 86 per cent of respondents (n=458) by 2005, and has remained approximately the same from that point in time onwards. Due to this increased consumer awareness and understanding of GI, the Foundation has developed scientific literature reviews to support general level health claims for low GI. The dossiers were conducted in accordance with the methodology required by Schedule 6 of Standard 1.2.7 – Nutrient, Health and Related Claims for the self-substantiation of general level health claims.

### THE FUTURE OF GI

The glycemic index, a measure of carbohydrate quality, has stood the test of time. The health benefits of lowering postprandial glycaemia in the context of a healthy diet are indisputable. The challenge is to ensure the food industry's investment in the formulation and marketing of a low GI products is economically viable. 

For more information visit [www.gisymbol.com](http://www.gisymbol.com).

Professor Jennie Brand-Miller (AM, FAIFST, FNSA) is Professor of Human Nutrition at the School of Life and Environmental Sciences and Charles Perkins Centre at The University of Sydney. She is the Director of The University of Sydney's Glycemic Index Research Service (SUGiRS) and the Glycemic Index Foundation. Dr Fiona Atkinson is the Research Manager at SUGiRS and a Director of the Glycemic Index Foundation. Kathy Usic is CEO of the Glycemic Index Foundation.

References for this article can be found on the AIFST website.



# WHY DO WE EAT WHEN WE ARE NOT HUNGRY?

*At what point will consumers reject modified foods? What are the conscious and unconscious predictors of food choice? Will consumers sacrifice taste for sustainability?*

**WORDS BY DRS RUSSELL KEAST, GIE LIEM, GEORGIE RUSSELL, SARA CICERALE  
THE CENTRE FOR ADVANCED SENSORY SCIENCE, DEAKIN UNIVERSITY**

## **NEW RELIABLE METHOD TO DETERMINE HEDONIC REJECTION**

The food industry is constantly looking for ways to make more cost-efficient products, which may involve changing processes, ingredients, shelf life or any number of other variables. The cost efficiency can only work if the product is still acceptable to the consumer. The sensory scientist has options. You could run a difference test to see if consumers can identify a difference between the original and modified product, but even if a difference is found, does this mean that the product will be less liked or even rejected by the consumer? A preference test may be run, but again just because the original may be preferred, doesn't necessarily mean the new product will be rejected.

A new study by a Brazilian group published in the *Journal of Sensory Studies* has validated the Hedonic Thresholds Methodology which comprises two assessment points, the compromised acceptance threshold and the hedonic rejection threshold. The method involves having consumers rate their liking of two samples that are presented side-by-side: one control product and one modified product. Multiple presentations will be made to the consumer in any one session. It is essential to have a control product that is optimal and a variety of modified products so figures can be constructed and regression analysis

performed. The point at which there is a significant change in sensory acceptance is termed the compromised acceptance threshold, and the point at which the modified product falls below a predetermined level of liking is the rejection threshold.

In this study the authors have determined repeatability, precision, reproducibility, accuracy and robustness of the method. They conclude that the method meets all criteria and generates reliable results. Such information has great potential for the food industry but knowing the extent to which you can modify a parameter without comprising consumer acceptance seems too good to be true.

## **EATING IN THE ABSENCE OF HUNGER**

Eating beyond physiological need contributes to weight gain and obesity. Investigation of the behaviours and factors associated with such an activity are timely. Recently, a study with 46 lean young female adults determined the amount of discretionary food these individuals chose to consume post-lunch meal (a standardised pasta dish) to determine their level of 'Eating in the Absence of Hunger'. Initially, participants were not told they would be offered more food after the lunch meal. Participants were also asked to complete a series of questionnaires including the Power of Food Scale questionnaire that measures one's level



of hedonic hunger (drive to eat in the absence of hunger) and their body weight was measured at various time points over the subsequent year.

The study's findings demonstrated that caloric intake during the post-lunch period was significantly positively associated with hedonic hunger, loss of control eating, and short-term weight gain. Focusing on Eating in the Absence of Hunger rather than what is eaten in regular meals may have valuable implications for weight loss and weight gain prevention programs. The study's authors note the lack of Eating in the Absence of Hunger investigations in the adult population. Considering the findings of the current study, there is sure to be more on the way.

### CONSCIOUS AND UNCONSCIOUS PREDICTORS OF FOOD CHOICE

To understand what consumers think of products, researchers can use a wide range of methods. Some of those methods heavily rely on explicit responses, such as questionnaires. Others aim to measure more implicit responses such as ingestion, response times, heart rate, skin conductance, facial expression, pupil dilation and eye tracking. The combination of conscious and unconscious responses could provide researchers with a better understanding of predictors of food choice.

The development of new measurement, methodologies and the ability to process large data sets has resulted in substantial interest in using biometric measurements in sensory science. In the coming years at least two important questions need to be answered: 1) how do biometric measurements respond to different aspects of food (eg, whether you like a food, a food is novel to you or fits with your expectations)?, and 2) do biometric measurements add value to traditional explicit measures such as questionnaires? Two recent papers in Food Quality and Preference aimed to provide some answers to these two questions.

Verastgui and colleagues gave participants a bitter and sweet solution in such a way that it varied in novelty and disconfirmation of expectations. The results suggest that heart rate correlates with perceived novelty and whether expectations are met or not, rather than how much you like a product. Skin conductance correlates with perceived novelty and whether you like a product or not. However, the hedonic responses to the used stimuli were clearly different. As expected, participants liked the sweet solution and disliked the bitter solutions.

Torrico and colleagues used different chocolates and investigated if biometric measurements could be used to differentiate


between the different chocolates. They measured facial expression, heart rate and facial skin temperature. In general, the biometric measurements used could not distinguish between the different chocolates.

These two papers seem to suggest that different food stimuli can result in a variability in some biometric measurements, however the differences between the stimuli need to be large. At this stage, such large differences seem to be obvious and can be measured with traditional explicit measurements. That is not to say that biometrics cannot add value to our understanding of food choice; they most likely will. However, the variability among consumers and the noise in current measurements will make it an interesting challenge.

### TASTE VS HEALTH VS ENVIRONMENT

Environmental sustainability is increasingly becoming a driver of food purchases as consumers become more aware of and concerned about the impact of their food habits on the environment. Policy makers have extended this to call for the consumption of diets that are both healthy and sustainable. But what are the best strategies for helping consumers to choose healthy and sustainable products? A recent study investigated the role of point-of-purchase factors in influencing the selection of food that was both healthy and sustainable (either a tomato, rice or meat product).

The researchers asked Australian consumers to participate in online hypothetical choice experiments where they chose between a standard product (eg white rice) and a more healthy and sustainable alternative (eg brown rice). They then varied the price of each product, and whether it displayed a health and/or environment logo or label, to determine how these influenced choices. The drivers of choice differed slightly depending upon the type of product, although price was a key driver of product choice across the three product types. Also of note was that hedonic factors were a key driver of choice, in that consumers were less willing to purchase the healthy and sustainable alternative if they did not perceive it as being tasty.

In designing products and communication strategies to meet growing demand for healthy and sustainable products, food producers and scientists are challenged with the task of making such products at a competitive price without compromising on taste. 

*References for this article can be found on the AIFST website.*





# *THE FUTURE OF FOOD SAFETY – MAKING IT STICK*

**WORDS BY DR ANDREAS KLIEBER  
PARTNER AND MANAGING DIRECTOR, QUALITY ASSOCIATES**

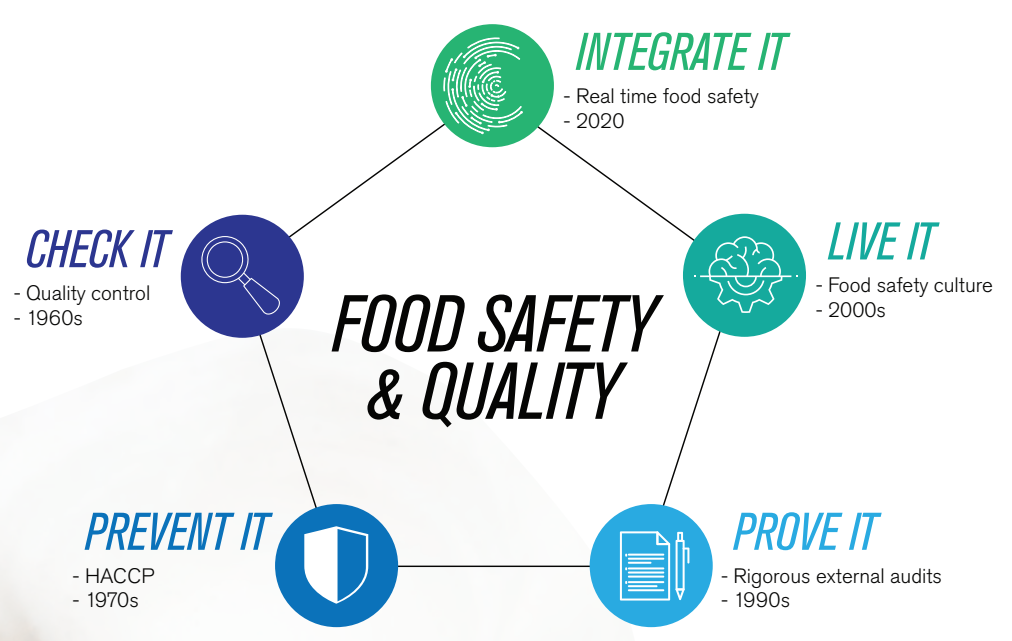
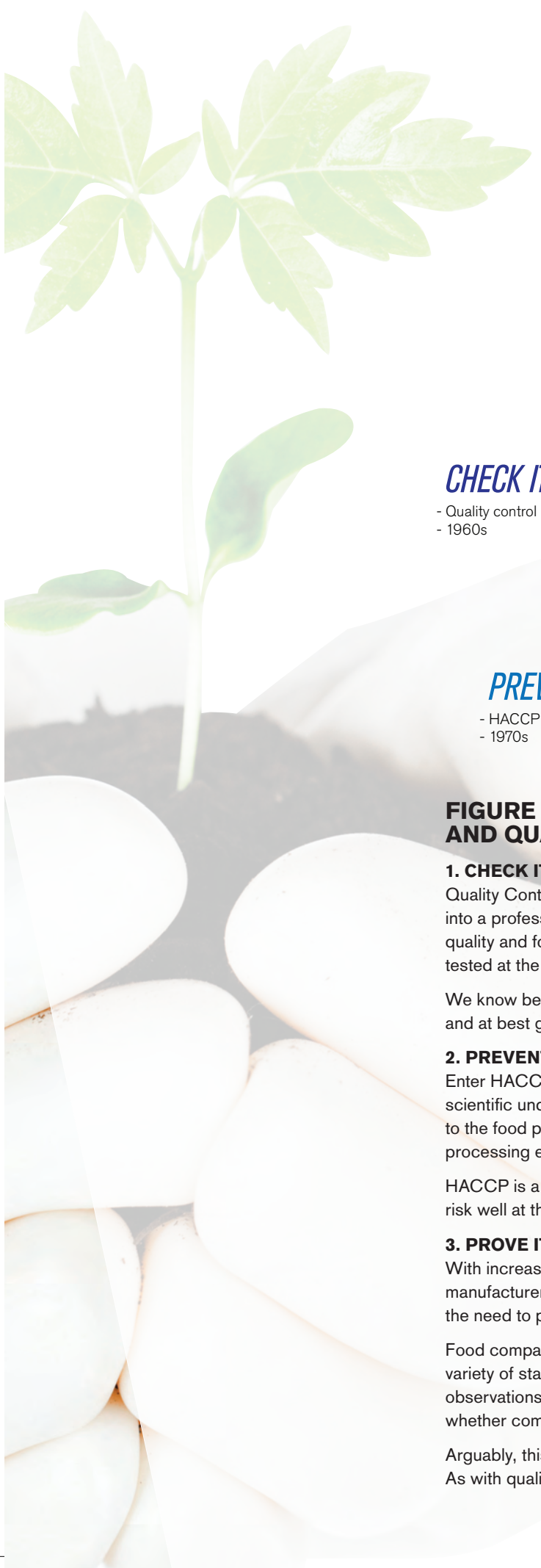
## **CAN A PACKAGE HELP STOP OVERCONSUMPTION?**

The food industry is a very dynamic industry driving product innovation, developing sustainability models in the face of international economic pressures and raw material challenges, and addressing nutritional requirements of increasingly sophisticated consumers. To support this push is a base of food safety and quality management systems to ensure that the food and beverages provided are safe.

However, as the number of food recalls and safety scares show us, no undertaking is without risk. To address this, food manufacturers and retailers have taken increasingly sophisticated measures to manage this risk. Many have adopted benchmarked international and/or private standards. These are all familiar to quality professionals and all have at their core a desire to protect the health of the consumer.

To understand where the future of food safety management lies, it is useful to look at how we arrived at the current cusp of change for the food industry (Figure 1).





**FIGURE 1 EVOLUTION OF FOOD SAFETY AND QUALITY SYSTEMS**

**1. CHECK IT (1960s)**

Quality Control checks were common practice in the food industry since it evolved into a professional manufacturing industry. This was based on the assumption that quality and food safety would be consistent in the product and could be inspected or tested at the finished goods stage.

We know better now; food pathogens and issues are not homogeneously distributed and at best gross failure of our food safety systems can be found this way.

**2. PREVENT IT (1970s)**

Enter HACCP. This system is based on preventing an issue occurring by applying scientific understanding to issues of biological, chemical, allergen and physical risks to the food product. This is supported by pre-requisite programs that ensure that the processing environment and handling is safe.

HACCP is a well proven methodology and when implemented rigorously manages risk well at the site level.

**3. PROVE IT (1990s)**

With increasing retailer involvement in 'own brands' and food and beverage manufacturers having to manage an increasingly long, international supply chain, the need to prove that HACCP systems work in practice has increased dramatically.

Food companies are extensively audited, some many times a year, to comply with a variety of standards. Whether the focus is on documents proving compliance or on observations on the manufacturing floor, these programs only provide a snapshot of whether compliance is achieved, or not.

Arguably, this auditing system is currently at the stage 1, namely the 'check it' stage. As with quality control, this methodology is fraught with issues. ►►



**FIGURE 2 FOOD SAFETY AND QUALITY INTEGRATION ENABLERS**

#### 4. LIVE IT (2000s)

It is now well recognised that the 'patchy' auditing of food and beverage manufacturing and retail sites does not ensure consistent implementation.

Food safety culture has emerged as a useful concept to help with the day-to-day focus on food safety. The basic tenets of food safety culture are:

- Creating a food safety culture through staff awareness; providing suitable training using easily understood tools, equipment, environment and self-assessment tools; management leading with real commitment; ensuring an open environment to raise concerns; and accountability at all levels.
- Communicating the food safety culture to the business and supply chain and reinforcing it consistently.
- Measuring the food safety culture.
- Providing positive feedback to all staff where warranted and celebrating the food safety culture.

This is the current focus of best practice food safety implementation around the world. It has been firmly embraced by leading manufacturers, retailers and regulators in Australia as shown by recent publications in *food australia* by Safe Food Production Queensland and on-line by Food Standards Australia New Zealand.

The aim is to keep the food safety system live at all times, offsetting the potentially very costly consequences of failure, for example through the need for recalls that can run into millions of dollars, potential business failure and personal liability of quality practitioners, staff and senior managers.

The limits of this approach are now evolving given the increasing global risk of food fraud and food attacks that cannot be managed by focusing on a given site alone.

#### 5. INTEGRATE IT (2020)

Where to from here?

Globally, many industry sectors are going through a rapid phase of innovation and transformation, often driven by technical disruptors. The food industry has much to gain, or to lose if ignored, by adopting these new developments.

Here, I will focus on four momentous developments for the now global food and beverage industry. They will transform the industry in the next 2-10 years and remove some of the costs of food safety system maintenance.

They will also have a major impact for service providers to the sector, such as testing, inspection and certification companies.

#### BLOCKCHAIN

Blockchain and similar technologies rely on a secure (encrypted), distributed (not centrally held) ledger of information that is transparent and cannot be altered after creation (without collaboration of the majority of users).

This way information on raw materials and food products can be passed on in a transparent way from origins, through the supply chain, and to the final consumer. This transparency allows risk mitigation through authentication and can be used, for example, with other developments such as labelling each item with a unique code to prevent food fraud.

Another application would be ensuring that raw materials come from a defined supply chain, rather than from unapproved suppliers or farms that pose unacceptable food safety risks.

#### THE INTERNET OF THINGS

The internet of things (IoT) simply is the increasing networking of equipment, sensors and switches to allow direct data exchange. This allows the direct acquisition of data during processing, for example critical control point (CCP) data, that can be automatically monitored by the site production, quality and management team. Already, three billion IoT devices are in use in industry globally.

Going a step further, this data could be used for remote monitoring and certification of sites without auditors stepping on site. This could be through exception reports for CCPs not being under control, tracking completion of prerequisite program tasks such as cleaning as well as reporting security breaches on a site in relation to TACCP and VACCP (Threat and Vulnerability Analysis Critical Control Points).

Where failure is reported, corrective actions could be tracked in real time. Auditors could therefore reduce the number of site



days, reducing impact on manufacturers, and focusing on the factory floor rather than documentation on site.

### GOOGLE GLASS

Here is a product that seemingly was a total flop, except that in its 're-born' form it is becoming an industrial tool that gains significant efficiencies during manufacturing.

Wearing these glasses, operators are able access step-by-step visual and text instructions, data and records, and check on compliance of processes. Whether it is cleaning instructions, maintenance instructions, real time CCP data, once the systems have been integrated with the glasses, information is instantly accessible to the operator where they need it on location.

Using the embedded camera, operators will also be able to record verification information, and networking and storing of the data will reduce compliance paper work.

By 2025, it is expected that more than 14 million US workers will be wearing Google Glass for work and several companies are supporting business integration.


### BIG DATA

Big data as a term refers to structured and unstructured data being acquired from multiple sources such as social media,

genomics data sets, food safety incidents, internet reports, supply chain information, legislative information and so on. This, when integrated, analysed and visualised appropriately, can be used for agricultural and food chain management and food safety risk evaluation and management.

In 2015, WHO embarked on the project FOSCOLLAB, which integrates monitoring programmes, alert systems, chemical data, consumption data and surveillance reports on diseases to gather hereunto unavailable insights.

As computer power and storage is becoming less expensive, these systems and data gathering and analysis will become widely used. Big data will also be able to draw from the above three trends of reliable supply chain data (blockchain), real time data acquisition (IoT) and on-site recording (Google Glass).

These new, exciting technological developments will mean that food safety and quality systems and management will evolve further from the current HACCP, auditing and food safety culture to a wholistic, integrated solution that will make real time food safety effective. 

## How does your TACCP/VACCP plan measure up?

It is estimated that food fraud costs the global food industry over A\$50 billion each year. An incident of food fraud can potentially destroy your brand and your business; so it is vital to take positive steps to mitigate the risk of food fraud.

Quality Associates can provide expert advice on food fraud and food defence including risks assessments, TACCP and VACCP audit readiness, supply chain management and internal controls.



We are leaders in food safety and quality services for the food industry. We provide expert support to Australia's leading supermarkets, FMCG and fresh food manufacturers, importers and exporters in the following areas:

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- Food Fraud and Defence
- Food Safety and Quality Systems
- Product Testing
- Food Factory Design and Compliance
- Product Traceability
- Food Safety Training (RTO 41341)



Call us on 1300 737 193 or visit [www.qualityassociates.com.au](http://www.qualityassociates.com.au)

# LOVING LUPINS

*Australian Sweet Lupins are capturing the attention of the food industry and consumers around the world due to their exceptional nutritional composition and versatility.*

**WORDS BY SOFI SIPSA**

## WHAT ARE AUSTRALIAN SWEET LUPINS?

The Australian Sweet Lupin is iconic to Western Australia, where the Mediterranean-style climate is perfect to cultivate this nutrient rich crop. In fact, Western Australia is responsible for 85 per cent of the world's lupin crop. Plant breeding in Australia over the last 60 years has resulted in modern cultivars of the narrow-leafed lupin (*Lupinus angustifolius*) with negligible amounts of bitter alkaloids. This neutral tasting bean no longer needs soaking in brine or cooking and can be easily prepared with quicker cooking methods. Australian Sweet Lupin is currently available as flakes and flour. The Lupin Flakes are the more versatile product and have a range of uses.

## SUSTAINABILITY

Part of the legume family that includes the likes of soy beans, peas and lentils, lupins play a vital role in the ecological balance of agriculture. Lupins are a valuable component of Western Australian farming systems, providing a key element in crop rotations; assisting soil aeration and injecting nitrogen, creating a better environment for growing other plants.

## HISTORY

Lupins have been consumed for thousands of years throughout the Mediterranean region and the Andean mountains. Lupins

were eaten by the early Egyptian and pre-Incan people, and known to Roman agriculturalists to contribute to the fertility of soils. In the late 18th century, lupins were introduced into northern Europe as a means of improving soil quality and by the 1860s the Garden Yellow Lupin was seen across the sandy soils of the Baltic coastal plain. The first steps were taken in the early twentieth century to truly transform the lupin into a contemporary, domesticated cropping plant. Pioneered by German scientists, their goal was to cultivate a 'sweet' variety of lupin that didn't have the bitter taste (due to a mixture of alkaloids in the seed) to make it more suitable for human consumption and animal feed. The successful development of lupin varieties with the necessary "sweet gene" led to greater adoption of lupins across Europe and Australia. Further work carried out by the Western Australian Department of Agriculture and Food in the 1950's and 60's has seen more sweet lupin crops produced in Western Australia than anywhere else in the world.

## PRODUCTION

Western Australia produces and exports Australian Sweet Lupin and Australian Albus Lupin; currently over 700k tonnes annually, worth over AUD\$200 million. Due to its unique nutritional value and health benefits, lupin is attracting increasing attention as a potential new superfood.







### AUSTRALIAN SWEET LUPIN NUTRIENTS

Lupins are the world's richest natural source of protein (40% per cent) and fibre (37 per cent). They are easily digestible, cholesterol free and are a convenient and healthy option suitable for a gluten free diet. Dietitians and medical scientists in Europe and Australia are researching the health benefits of the Australian Sweet Lupin, which has a low glycaemic index (GI). There is supportive scientific evidence that consuming foods enriched with Australian Sweet Lupin can provide a feeling of fullness, resulting in people eating less and consuming fewer kilojoules.

### ALLERGY ADVICE

Lupin, like other protein-containing foods (eg peanuts, soy, shellfish and eggs) may trigger an allergic reaction in a small percentage of the population (less than 1 per cent) and some caution is needed. People with allergies to legumes, especially to peanuts, should avoid lupin. ⓘ

### LUPINS: NUTRIENT PROFILE AND BENEFITS

- › High in protein (40%); twice that of chickpeas and nearly three times that of quinoa.
- › High in fibre (37%); nearly twice the fibre of chickpeas, acting as both soluble and insoluble fibre.
- › Lowest glycaemic index of any commonly consumed grain. Low GI foods slow the absorption of sugars into the bloodstream to help balance blood glucose levels.
- › Three times more iron than kale.
- › Naturally gluten free.
- › Australian Sweet Lupins are low in alkaloids and anti-nutritional factors.
- › Are not genetically modified.





The Consultant

# JANETTE MCDONALD

PRINCIPAL CONSULTANT,  
JANETTE MCDONALD CONSULTING

## WHAT HAS BEEN THE MOST IMPORTANT OR INTERESTING FOOD INNOVATION YOU'VE WITNESSED IN YOUR LIFETIME?

I have to pick two innovations – the microwave oven and high pressure processing (HPP).

## WHAT'S THE MOST UNUSUAL OR INTERESTING JOB YOU HAVE EVER HAD?

Product Development has always been the most interesting job and optimising the shelf life of dried sea cucumber (Beche de Mer) the most unusual project.

## WHAT MIGHT OTHER AIFST MEMBERS BE SURPRISED TO LEARN ABOUT YOU?

My first degree was in science majoring in geology. I was going to be a volcanologist. However, as my second major was zoology, I opted for the safer option of palaeontology. Soon after graduation I moved to Sydney and was offered a place in a Post Graduate Food Science course by Professor Paul Baumgartner, and I never looked back. I will be forever grateful for his support.

## WHAT DO YOU SEE AS THE MOST VALUABLE BENEFIT OF BEING INVOLVED WITH AIFST?

Opportunities for networking, collaboration and learning.

## WHAT DO YOU THINK WILL BE THE MOST SIGNIFICANT CHANGE IN OUR SECTOR OVER THE NEXT FIVE YEARS?

Student expectations for meaningful jobs in the food industry and related fields. This means that universities offering food science and nutrition studies will need to build stronger relationships with the food industry (here and internationally) to differentiate teaching and learning programs and support the funding and application of relevant research. The collaboration would aim to reinforce collective drivers of innovation and growth. 🌱



# Stand Out from the Crowd...



**AIFST promotes the growth of the Australian food industry through an individual-focused approach supporting the professional development of individuals within sector and a joined-up network across the country.**

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## Top 10 reasons to join AIFST:

1. Be a part of the only national, cross-discipline food industry network.
2. Career development support including a food science mentoring program, technical workshops, symposiums, CV support and career focused webinars.
3. Access to a range of scholarships, awards and competitions including the annual awards program, industry based scholarships and Student Product Development Competition.
4. Link with like-minded professionals through the specialist and geographical Communities of Interest.
5. Keep your finger on the pulse with the latest food industry news including regulatory changes and industry standards through *food australia* magazine and monthly BiteSize and Toolkit e-newsletters.
6. Access discounted rates for events, training and industry forums.
7. Opportunities to profile your individual or organisational technical expertise across the AIFST digital platforms.
8. Members-only activities including site and factory tours.
9. Members are eligible to apply for Professional recognition which includes AIFST post-nominals.
10. Expand your food connections across the science, technology and innovation sector.



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### Secure a 2018 bundle package in *food australia*.

Bundle packages provide access to both online and print advertising, providing up to 25% discounts on 12-month packages.

With extended reach via AIFST website advertising, combined with the power of *food australia* advertorial and advertising opportunities, you can make the most of your 2018 marketing spend. Reaching a targeted and direct audience of decision makers, *food australia* is a platform to get your brand in front of engaged customers.

If you want to showcase your business and feature new releases and business developments, AIFST can work with you to ensure you get great brand positioning to leverage your advertising investment. Advertisement and advertorial layouts are flexible.

Contact AIFST to discuss bundled packages today and secure your place for 2018! Phone AIFST on 0447 066 324 or via [aifst@aifst.com.au](mailto:aifst@aifst.com.au).