

food australia

Official publication of AIFST Inc

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JUNE/JULY 2014

Dairy Innovation

Cheese of Choice

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Ballantyne
DAIRY INNOVATION

Also Inside
INNOVATING FOR OUR FOOD FUTURE
PROTECTING INTELLECTUAL PROPERTY
3D MODELLING OF FOOD BREAKDOWN AND FLAVOUR

ON THE COVER

Taste the difference of dairy innovation

The growing global popularity of dairy products is driving innovation and change. Consumers prefer more authentic tastes and less artificial ingredients. Industry is demanding greater convenience and quality security. Ballantyne is meeting these market needs and more through innovative products, customer partnerships and new quality systems.

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- Creating consistent, reliable cheese flavour and functionality to your applications
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For more information please contact denise.borghi@ballantyne.com.au



Clean label options

In a world where consumers are looking for cleaner labels and all natural ingredients, Ballantyne can provide preservative free, all natural cheese powders that will ensure your product tastes great too. 🍌

The new-look Ballantyne

You may have noticed we've changed our logo to reflect our transition to a global business combining innovative dairy products and expertise with our traditional values of quality and service.

The phrase, Dairy Innovation, is both a summary of what we do and an indication of our goals. We look forward to achieving them with you, our customers.



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FROM THE PRESIDENT

Welcome to the June/July issue of *food australia*.

This is always an exciting time for the Institute. We are on the home stretch to the 2014 Convention, where we are expecting over 600 delegates to join us for a full program of interesting and challenging topics that are sure to spark some lively discussion. Read more about the Convention on page 13 or by reviewing the Convention supplement included with your copy of the journal.

In this issue we take a close look at food safety, including a review of the updates to the latest release of the Food Standards Australia New Zealand (FSANZ) Food Recall Protocol as well as some of the latest consumer research on their understanding of food safety advice on labels.

We also have a great feature on protecting intellectual property (IP) to help maintain a competitive edge. IP is a tangible asset that extends well beyond the branding and labelling of a product, and can include the production of ingredients, the creation of recipes and the manufacturing process. Read more on page 42.

On page 18 we look at a world first by CSIRO – a 3D computational model of food breakdown and flavour release that is creating new opportunities for food formulation by reducing the time and effort required to reformulate new foods.

We hope you enjoy *food australia* and I also hope to see you in Melbourne at the 2014 Convention from 22-25 June.

Until then, happy reading.

Dr Anne Astin

AIFST President





BY THE NUMBERS

GROWTH OF FREE-FROM PRODUCTS

Once relegated to small health food stores, free-from products are now star items at national supermarkets and local grocery stores.

The free-from banner covers everything from gluten-, lactose-, dairy-, GM-, yeast-, wheat-, fat-, nut-, soy-, salt- and egg-free food to food for vegans, and food that has no sugar, additives and preservatives.

Supermarkets are dedicating more shelf space and improving in-store signage, as well as offering their own brand ranges in many instances.

According to Innova Market Insights, while claims using the term 'natural' have increasingly come under fire for lack of clarity regarding definition, the use of additive-free and preservative-free claims has been able to move forward relatively unhindered.

"Interest in naturalness is still highly evident, however, and is also reflected in the growing use of GM-free labeling. That said, it remains relatively limited on a global scale," said Innova's director of innovation, Lu Ann Williams.

"It is clear that the free-from sector is set for further growth, with interest continuing to spread from those diagnosed as specific allergies and intolerances, via the self-diagnosed to those with a more general interest in health and wellbeing.

"The ongoing development of a greater range of products with a high-quality image and a good-taste profile is helping this along."

Here are a few key findings from The Innova Database.

Source: Innova Market Insights, 2014.



Of total food and drink launches recorded globally in 2013, 13% used additive- and/or preservative-free claims, up from 10% in 2008.

The use of lactose-free claims has been less popular than gluten-free, but even so 1.5% of global launches used this positioning in 2013, double that of five years ago.



Nearly 8% of product launches recorded globally in 2013 used a gluten-free positioning.



The global market for gluten-free products was worth \$2.5 billion in 2010. According to Packaged Facts, sales of gluten-free labelled foods will exceed \$5 billion by 2015 and \$6.5 billion in 2017.



Gluten-free foods have experienced phenomenal growth and sales in Australia and are predicted to reach \$104 million by 2015.

Global trends suggest there is no sign of slowdown in the sale of gluten-free foods, and the Australian market is reportedly forecast to hit \$98.6m by 2015.



Just 2.3% of global launches tracked used GM-free labelling in 2013. Snacks, bakery and dairy have the largest number of launches, reflecting the significance of GM ingredients in sectors using high levels of cereals for food or feed, ahead of meat, fish and eggs, confectionery and ready meals.

ABARES. Australian agricultural productivity growth: Past reforms future opportunities. Canberra. February, 2014. Available at daff.gov.au/abares/publications



SCIENCE TACKLES THE WORLD'S FOOD CRISIS



From left: FutureFood 2050 team: Josh Schonwald, Scott Hamilton Kennedy and Trace Sheehan.

the program showcases 75 interviews featuring thought leaders around the globe discussing how science is tackling the world's most pressing food issues.

Food science is an essential ingredient for feeding the world sustainably, according to FutureFood 2050, a new online program launched by the Institute of Food Technologists (IFT).

Headed by an independent editorial team,

"Until now many films have focused on food issues, but they often neglect or misinterpret the role of science," says the documentary's Academy-Award-nominated director, Scott Hamilton Kennedy.

"By looking through a scientific lens, our take on feeding the world will be unique. The goal is to address critical questions surrounding food in a fair, transparent manner that will hopefully surprise us along the way."

From now until the film's 2015 release, the FutureFood 2050 website will serve as a digital hub for the public to follow the stories and connect science to the conversation about how to feed the planet.

For more details, visit www.futurefood2050.com

MILK PRICING CHANGES FOR DAIRY FARMERS

Fonterra Australia has launched an industry-leading overhaul of its milk pricing structure in response to Australian farmers and dairy industry members requests for a simpler milk price system.

"We listened to farmer and member feedback and agreed we needed to actually do something to lead the industry forward," said Fonterra Australia managing director Judith Swales.

According to Swales, the move will help the company deliver on its commitment to ensure that its suppliers are the most profitable dairy farmers in Australia and can grow their farm businesses into assets for the future.

"The result is a win-win for dairy farmers, the industry and Fonterra Australia. It is simpler, fairer, equitable and more transparent," said Swales.

"The new structure will reduce the range of prices paid to farmers against the average and will help them understand the impact milk price and incentives have on their businesses so they can make more informed decisions on farm.

I believe it will be instrumental to setting up farmers and the industry for long-term, sustainable growth," said Swales.

The new system was developed over more than a year in partnership with Bonlac Supply Company (BSC) and in collaboration with industry and international pricing system experts.

Key changes include:

- A simplified base price: Multiple seasonal tables will be simplified into one seasonal table for all suppliers based on a five/seven, peak/off peak split
- SRP will be removed: This incentive will be removed and reinvested into off-peak pricing to reduce risk for farmers and maintain a price signal for the value of off-peak milk to our customers.

DARK CHOCOLATE'S HEALTH BENEFITS SECRET

Many chocolate lovers have remained blissfully unaware of the precise reason bittersweet dark chocolate seems to improve cardiovascular health. Until now, that is.

The American Chemical Society (ACS) recently solved the confection conundrum with the finding that specific chocolate-loving microbes in the gut convert an otherwise indigestible portion of the candy into anti-inflammatory compounds.

Using a series of modified test tubes to simulate the human guts, researchers exposed several forms of cocoa powder to digestive juices and enzymes, and then to bacteria found in samples of human faeces.

They found that after cocoa was "digested", long molecules called polyphenolic polymers remained within the gastrointestinal, or GI, tract until they encounter microbes in the human colon, particularly bifidobacterium and lactic acid.

According to researcher John Finley, professor of food science and biochemistry at Louisiana State University the smaller molecules that result from this fermentation can travel through the gut wall and be used by the body.

"These materials are anti-inflammatory and they serve to prevent or delay the onset of some forms of cardiovascular disease that are associated with inflammation," said Finley.



He said it was possible that the beneficial compounds contained within cocoa powder might one day be processed into pill form, and noted that Mars Inc was partially funding research into that possibility.

However, Professor Finley said he wasn't very excited by this prospect. "I would rather eat a big old chocolate cookie or a cup of cocoa than ... take a pill," he said.



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RIPENING OF CHEESE

Understanding the role of salt in the cheese-making process is crucial in order to explore new sodium reduction strategies. The International Dairy Federation (IDF) has launched a report highlighting that salt reduction in cheese is limited by food safety considerations and technological and functional needs.

The report, *Importance of Salt in the Manufacture and Ripening of Cheese*, points out that the global dairy sector recognises the impact of sodium intake on human health and the World Health Organization recommendation to reduce sodium from all food sources to reduce the risk of cardiovascular and coronary heart disease and stroke.

However, as Paul Paquin of Institute of Nutrition and Functional Foods, INAF/STELA, University Laval Canada explains, there are major differences in the role of sodium in different food products which should be taken into account when defining sodium reduction strategies.

“In certain cases, the food matrix can even reduce the impact of sodium on blood pressure, as has been demonstrated with certain milk products,” said Paquin.

Salt has been used for thousands of years to preserve foods by inhibition of growth of undesirable micro-organisms and for technological properties and functionalities.



“In order to reduce the salt content of cheese, reductions need to be made with care, so as not to affect the safety and quality of the product, as well as to allow for the consumers’ palate to adjust. In addition, manufacturing procedures need to be developed further. From the perspective of today, the addition of salt will remain an integral part of the process of cheese-making,” he said.

This report concludes that further research on the impact of salt reduction in the area of food safety is still required.

NEW CENTRE TO BOOST FOOD TECH CAPACITY

The University of Sydney has launched a new training centre designed to boost the nation’s food technology and manufacturing capacity.

The ARC Biotechnology and Food Processing Training Centre will be directed by Professor Fariba Dehghani from the University’s School of Chemical and Biomolecular Engineering.

According to Professor Dehghani, Australian businesses require more advanced manufacturing techniques in order to reduce costs and increase energy efficiency.

“A key objective of the new centre is to boost the Australian industry’s capacity to compete in a global market, particularly in the production of nutraceuticals for pharmaceuticals, dietary supplements, or food ingredients,” said Dehghani.

“The centre will design cost-effective and sustainable processes for producing these types of products with a view to minimising waste while enhancing efficiency and reducing energy consumption,” said Dehghani.

The work of the engineering team will be complemented by the expertise of food science and chemistry researchers based in the university’s Department of Plant and Food Science.

Funded for three years, the centre’s research projects will be delivered by 13 PhD students and three Post-Doctoral Fellows.

IMPROVE ENERGY EFFICIENCY

Real electricity prices for the manufacturing sector have increased by 60 per cent in the past decade while gas prices have increased by 29 per cent during the same period.

To make sure your energy costs don’t blow the budget, the Australian Food and Grocery Council (AFGC) has established the Empower program. It is designed to assist small-to-medium enterprises (SMEs) improve energy efficiency and save costs by providing free energy assessments and support.

Funded by the Department of Industry, the program offers on-going support through web-based tools, fact-sheets, workshops, webinars and newsletters.

According to Kartik Madhira, AFGC’s sustainability policy and program analyst, the rising cost of energy presents a significant barrier to improve business profitability and competitiveness, particularly with food and grocery manufacturing SMEs who are often time and resource constrained.

“Many SMEs struggle to access expert advice to improve energy efficiency and as such may benefit from the monitoring and customised action plans that the free AFGC Empower program can provide,” said Madhira.


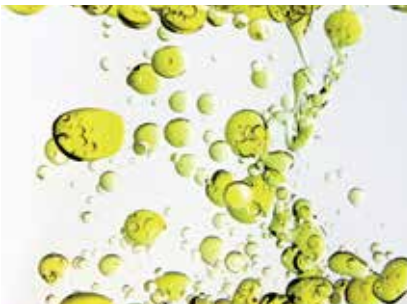
Businesses can access free online energy saving tools or register for energy assessments at: www.afgcpower.org.au




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PEOPLE

Setter moves to Consolidated Pastoral Company

Troy Setter has been appointed as chief operating officer at Consolidated Pastoral Company (CPC), one of Australia's largest beef producers with approximately 360,000 head of cattle across 5.6 million hectares of land. He was previously chief operating officer of rival company, Australian Agricultural Company Limited (AACo).

"It is a great time to be joining CPC where the business is very well positioned and focused on taking advantage of increased global demand for beef," Setter said.

During his time at AACO he successfully executed a three-year strategic plan to restructure its operations and diversify sales to new markets, invest in and divest assets, develop and implement the genetic improvement strategy and increase profitability and herd size.

AACo has announced Setter's position will no longer exist and his responsibilities will be reallocated among its leadership team.

New CEO for Foodbank Australia



Australia's largest food relief agency, Foodbank Australia, has announced the appointment of Jason Hincks as chief executive officer. Hincks was previously chief operating officer of the successful men's health charity, Movember.

Prior to moving into the not-for-profit space, Hincks developed his marketing, management and strategic skills in organisations in Australia and the United States.

"We are seeing the number of food insecure people in Australia increase at an alarming rate," said Enzo Allara, Foodbank Australia's chair. "We've developed a strategy

to address this and we're well placed for Jason to bring to bear his wealth of experience in the area of rapid growth management and fundraising coming, as he does, from an organisation that in 10 years has spread to 21 countries and raised \$576 million in aid of men's health programs," Allara said.

Hincks replaces outgoing CEO, John Webster, who is retiring after five years in the role.

Mooney joins Pork CRC board



Pauline Mooney, executive director of South Australian Research and Development Institute (SARDI), has been appointed to the board of directors of the CRC for High Integrity Australian Pork (Pork CRC).

Affiliate Professor Mooney replaces Simon Maddocks on the board, after he resigned to accept a position as Vice Chancellor at Charles Darwin University in the Northern Territory.

Professor Mooney has broad knowledge across a range of science programs and related research activities, including breeding superior plants and developing sustainable production systems through novel processing techniques, post-harvest handling and storage systems, evaluating consumer preferences and natural resource management.

"Although the drivers and science behind the Pork CRC's programs will be new to me, my research interests have always been eclectic, so the opportunities the industry has before it and the associated challenges certainly have sparked my interest," said Mooney.

WHERE DO YOU FIND AUSTRALIA'S LEADING FOOD INDUSTRY RECRUITERS?

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SYDNEY | Brett Price, Emma Lowes Richard Broughton and Scott Eastwood | (02) 9223 5400
BRISBANE | Dominica Carolan | (07) 3832 9866

Logistics | Quality Assurance | Engineers | Packaging Specialists | Sales & Marketing
 Research & Development | Middle and Senior Management | Operations



New executive officer for dairy program



Brad Granzin has been appointed the new executive officer for the Subtropical Dairy Program (SDP), one of eight regional development programs under Dairy Australia, which extends from the Atherton Tablelands in far-north Queensland to northern New South Wales.

Granzin holds a PhD in dairy science and has worked in the industry for 25 years as a researcher and more recently in departmental management roles. He has been on the board of Subtropical Dairy and held the position of deputy chair from 2009 to 2011 so already has an in-depth knowledge of the overall strategy and workings of the organisation.

Patties Foods brings in new CEO/MD



Steven Chaur is the new chief executive officer and managing director of Patties Foods. His previous positions include managing director, Pacific, of Saint-Gobain, Executive general manager of Tip Top Bakeries (Southern region), general manager of Findus Australasia and general manager

of National Foods Tasmania.

Patties Foods chair Mark Smith said Chaur had a strong track record in transforming companies in the baking, dairy and frozen foods industries. He will replace acting CEOs Michael Knaap and Tim Peters who have run the company following the departure of the former boss Greg Bourke.

Prestigious fellowships for Monash researchers

A biochemist and a plant geneticist from Monash University are among researchers who have been announced as Fellows of the Australian Academy of Science (AAS).

Professor Jamie Rossjohn from the Department of Biochemistry and Molecular Biology, who is also an NHMRC Australia Fellow, was elected for his research into the structural basis for T-cell recognition of foreign antigens, which has had a profound impact on our understanding of immune recognition, particularly in autoimmunity and drug and food hypersensitivities.

Professor John Bowman, a plant geneticist based in the School of Biological Sciences was elected for his highly original discoveries that have revealed the genetic basis of three fundamental processes in plant development.

“Over the course of my career, my research has focused on learning about the genetics and evolution of plants. Our recent discoveries may contribute to developing a new type of hybrid seed which could have a significant impact in agriculture,” said Bowman.

As a result of his current research, Professor Bowman is now a scientific advisor to the Gates Foundation, which aims to produce a new type of seed for farmers in Sub-Saharan Africa to increase crops and reduce famine. 📍

Farewell to Tony Bardsley

Words by Ronald Cossen



Tony Bardsley passed away on 24 March 2014, aged 80. He had a successful career in the food industry, including being managing director at Heinz Australia and Bonlac Foods.

In 1954, Bardsley graduated from the University of Melbourne with a BSc in chemistry and microbiology.

Following three years with Kia Ora Industries, he joined Heinz Australia,

an association that would become a dominant part of his working life. He worked for Heinz in Pittsburgh, USA, and in Mexico City in the 1960s before returning to Australia in 1970 where he was general manager of Manufacturing at the Dandenong factory in Victoria.

In 1978, Bardsley held the position of joint managing director with responsibility for all non-Heinz branded businesses that included the Stanley Leasingham Wine Company, Greenseas Fishery Division, Epicure Foods and Golden Days Health Foods. Two years later, he was appointed managing director of all Heinz operations in Australia.

Following a successful 30-year career at Heinz, Bardsley undertook the challenge of merging a group of long-established dairy cooperatives and in 1986 became the managing director of Bonlac Foods Limited – an amalgamation of several dairy operations.

Throughout his career, Bardsley held various positions including:

- Trustee for the Committee for Economic Development of Australia
- Fellow of the Australian Institute of Management
- President of the Packaging Council of Australia
- Member of Executive Council of the Australian Dairy Industry Council
- Inaugural chair of the Horticultural Policy Council of Australia.

In a moving oration at Bardsley's funeral, his son Greg remarked, “There was hardly a day when he was at Heinz Dandenong that he didn't go out onto the factory floor or wander through the warehouse. He wasn't checking up on anything but he wanted to make sure he showed his face and talked to the people who made things happen.”

Tony Bardsley will be remembered for his contribution to the Australian food industry and the many long lasting friendships he established in a successful career. On a personal note, I have not only lost a loyal colleague and a great friend, but also a passionate Essendon supporter.



AIFST

WELCOMING NEW FELLOWS

We are thrilled to announce that four longstanding AIFST members have been elected to the prestigious membership status of AIFST Fellow.



Callum Elder is executive director of quality and innovation at Simplot Australia. Elder has been a professional member of AIFST since 1999 and has played a strong leadership role in the institute for many years.

His professional career has spanned senior technical and management roles within the food industry including processing for the dairy, fruit and vegetable, seafood and pre-prepared meals sectors. He has actively been involved in innovation, research and development, and technology transfer.



Dr Megan Sheehy is technical services manager at Viterra, the largest malt producer in Australia. She has been a member of AIFST for nearly 20 years and has played an active role in the institute, particularly as part of the SA Branch.

With a PhD in food microbiology, Dr Sheehy's professional career has included a variety of roles within Viterra and prior to that Lion. In her current position, she plays a critical role at the nexus of technical, operations and marketing to ensure that the company achieves strategic goals around market volume and profit targets.



Philip Strong is the managing director of Halcyon Proteins. He has been a member of AIFST for over 30 years, and he has played a very active and valued role with the Victorian branch.

His professional career began in 1980 with Transfield, but in 1983 he joined the family business Halcyon Proteins. His areas of expertise include spray-drying technology, protein extraction, savoury flavor development and food plant and design.



Martin Eagle is the business and development manager at Hawkins Watts Australia. He has been a member of AIFST for nearly 20 years and in that time has been actively involved in the Victorian branch.

Throughout his career, Eagle has also had senior roles with Danisco, Scanzo Food Industries and Mauri and has been actively involved in the technology transfer of innovations in probiotics, hydrocolloid, hydrocolloid, emulsifier, colour and flavor technologies into new product developments for the food industry.

Each of the elected Fellows has made an outstanding contribution to the Australian food industry through their commitment to food science and technology. We warmly welcome them and know that each will continue to make an outstanding contribution working closely with AIFST to mentor tomorrow's leaders.



THE 2014 AIFST CONVENTION IS JUST TWO WEEKS AWAY!!

We are expecting over 600 delegates at the convention which will be held in co-location with FoodPro 2014 (300+ exhibition stands and 9000+ visitors) in Melbourne on 22-25 June. The full programme and registration details are available at:

www.aifst.asn.au/convention | contact the AIFST office 02 9870 8688 | aifst@aifst.asn.au

2014 CONVENTION: STILL TIME TO REGISTER

The 47th AIFST Annual Convention is full of not-to-be-missed sessions with leading local and international speakers sharing some of the latest innovations, thinking and research. There are still registrations available – contact Julie on julie@aifst.com.au or 02 9870 7400 or visit www.aifst.asn.au/convention.

To be held at the Melbourne Convention and Exhibition Centre from Sunday 22 June to Wednesday 25 June 2014, we are expecting over 600 delegates, and this year we will also be co-located with Foodpro 2014 which features over 300 stands from industry suppliers.

The theme, Food – The Final Frontier: Challenges and Opportunities in the 21st Century, has inspired a really exciting program, bringing together interesting and challenging topics. It's sure to spark discussion and debate.

The Convention will cover areas as diverse as processing efficiency and effectiveness; diet, health and performance; food reformulation for the 21st-century consumer; traceability; allergen risk management and development; food chemistry and safety; supply chain economics; cereal science; and sustainability.

Pioneering Australian research

Salinity is a national and global problem that is estimated to cost Australian agriculture up to \$1.3 billion. Currently, more than 11 per cent of Australia's agricultural land is affected and it is predicted to hit 34 per cent by 2050. At the Convention we will hear about the latest studies to increase salinity tolerance in crops important to the Australian economy, such as wheat, barley, grapevines and soybeans. There will also be several sessions looking at the latest agrifood innovations across meat, horticulture, seafood and wine.

From mining boom to food boom?

Global food demand is expected to almost double over the next 35 years, and much of this growth will happen in Asia. Based on Australia's proximity to Asia, strengths in key commodities like meat, cereals and dairy and the industry's ability to innovate will be essential. We pose the question can food exports replace the mining boom for economic prosperity? Join the debate with food experts at the Food Leaders Roundtable Forum, led by ABC's Emma Alberici.

Separating fact from fiction

Monash University's Jane Muir will separate fact from fiction in the emerging story of gut health, while the University's Peter Gibson will take the newest trend of gluten-free foods head on, exploring whether increasing demand driven by consumers, pseudoscience or science. We will also discover how health and nutrition is driving food innovation.

All in all, it will be three days of informative, stimulating presentations and thinking, combined with a great social program to ensure we maximise the opportunities for delegates to connect as an industry.

The event's major sponsor is the Federal Government through Food Innovation Australia Limited (FIAL), which is an initiative to accelerate commercially driven collaboration



Delegates at the 2013 AIFST Convention in Brisbane.

and innovation in the Australian food industry. It is events like the annual AIFST Convention that provide an important platform for establishing the industry connections that initiatives like FIAL can then support for collaborative innovation opportunities.

LR Lloyd's Register
LRQA

When it comes to food safety assessment, we're top pick.

See our article in the convention supplement www.lrqa.com.au



IFT LEAD 360 WINNER ANNOUNCED



Rob Porfiri, product development manager at Trisco Foods, has been announced as this year's Australian representative at Institute of Food Technology (IFT) LEAD 360, a global leadership development program designed for emerging food science professionals.

In his role at Trisco Foods, Porfiri is responsible for the performance and management of the Product Development department and is a member of the senior management team.

Commenting on Porfiri's selection, AIFST executive manager Mel Malloch said that he impressed the panel with his significant achievements and his vision to make a difference in the world of food science.

"Rob demonstrated strong leadership, advocacy and drive. He has achieved so much in his career already, and recognises the important role of a food technologist in fostering, championing and implementing innovation process in their company.

"Rob played an integral role in the innovation that drove the development and launch of Trisco's first patented

product and a world first liquid thickener concentrate for people with dysphagia. He is committed to making a meaningful difference in the world of food science, and the panel agreed he was a fantastic applicant to represent Australia at the event," said Malloch.

Commenting on his successful application, Porfiri said he was thrilled to be selected for what expects to be a truly exceptional opportunity to access to the insights of global leaders in food science.

"I hope to engage internationally with my peers to share experiences, scientific developments and trends that will expand my perspective of the global food industry. I am very grateful to AIFST for this opportunity," said Porfiri.

The 2014 LEAD 360 program will be held in New Orleans, Louisiana, alongside the IFT Annual Meeting and Food Expo, running from 21-23 June 2014.

The EAD 360 program seeks to develop the next generation of international industry leaders and help them establish lifelong connections within the industry, academia and government.

AIFST acknowledges the support of the Australian Food and Grocery Council (AFGC) for this initiative.

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QUALITY AND SAFETY AUDITING – REDUCING THE BURDEN

‘Food safety’ is more than just a subset of ‘food quality’. If suppliers are serving many customers, duplication – if not replication – of auditing is likely to occur.

Words by *Geoffrey Annison*

One of the perennial issues facing the Australian Food and Grocery Council (AFGC) and its members is the cost burden of quality and safety audits along the supply chain. Of course, the AFGC is a strong supporter of the preventive approach to securing food safety based on the well-established Hazard Analysis Critical Control Point (HACCP) framework. The AFGC is also a strong supporter of auditing as a critical element of ensuring that HACCP systems are implemented effectively.

From a public policy perspective, auditing should be separated into two broad areas:

- auditing of food manufacturing and handling management systems (i.e. food safety and quality programs) to ensure food is safe
- auditing of those systems to ensure a particular quality of product is produced.

Many would argue that ‘food safety’ is a subset of ‘food quality’ and broadly speaking, they are right. But producing safe food is an absolute regulatory requirement, whereas many aspects of food quality are agreed contractually between supplier and customer, and are therefore, in essence, a commercial requirement. The corollary is that the regulatory requirement for food to be safe creates a commonality that all audits must address. The consequence is that if suppliers are serving many customers, each requiring periodic audit, there is a high likelihood that duplication, if not

replication, of auditing will occur.


The issue was identified as a source of inefficiencies and a cost burden across the food manufacturing sector in the report of the Food Processing Industry Strategy Group.¹ To address the issue, the report recommends that “the Australian Food and Grocery Council convene a forum to undertake a cost-benefit analysis of the current level of quality assurance (QA) auditing of the processed food industry and to develop recommendations of alternative options that reduce the regulatory burden on business – retail and manufacturing – without compromising food standards”.

An AFGC member survey conducted last year confirmed that there is substantial duplication in QA auditing which imposed additional costs on the industry of many millions of dollars. One survey respondent manufacturing a minimally processed product reported being audited seven times in a year and on each occasion the manufacturer had to pick up the costs. Clearly, at least for this business, and probably many more, a streamlining of auditing of the business would be beneficial.

In March this year, the AFGC convened a Quality Assurance Auditing Forum with participants from suppliers, foodservice, retailers and auditing companies. The Forum agreed there should be further exploration of how mutual recognition of the food safety aspects of food safety and quality assurance auditing might be progressed.

Importantly, the Forum also recognised that the value of QSA auditing along the food supply chain should be enhanced. The focus should not only be on cost reduction, but also on promoting auditing as a value-add process assisting all parts of the supply chain to meet both regulatory and commercial obligations in producing safe, quality food products.

A mechanism for doing this is to ensure that the competencies of auditors are maintained at the highest level with their skills and experience recognised and appropriately rewarded. This is critical to attracting high calibre professionals into the industry.

The Forum supported moves to simplify auditing by recognising the commonality of critical food safety elements of QA standards, which would then allow standardisation of reporting and the potential for integration of IT systems. Notwithstanding that, all agreed that it is a fundamental right of companies to develop and maintain their own auditing programs and request suppliers to engage within those programs as a part of commercial agreements. 

Reference

1. www.innovation.gov.au/Industry/FoodProcessingIndustry/Pages/StrategyGroup.aspx

Geoffrey Annison, PhD, is deputy chief executive and director of health nutrition and scientific affairs at the Australian Food and Grocery Council.

RAPID FOOD SAFETY TESTING TO MEET TIME AND BUDGET CONSTRAINTS

Much of the literature about food safety sampling plans assumes that all lots entering commerce are tested. In reality only a fraction of lots may be tested due to resource, staffing and budget constraints.

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“The indicator dye and built-in grid facilitates counting colonies which means there is less chance for error compared to other methods.

“The plates provide a better assessment of actual coliform or E. coli levels than the 9-tube Most Probable Number (MPN) test that gives an upper and lower limit to the number of bacteria that are present in a given sample.”

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MORE THAN JUST A MOUTHFUL

CSIRO's 3D modelling of how we masticate food is providing opportunities for food formulation and flavour and might even create the next taste sensation.

Words by *Simon Harrison*

It's unlikely that when you bite into a burger or chomp on some chocolate that you give much thought to how you taste food. It probably has never crossed your mind how you break it down as you bite, chew and swallow, and how and when you perceive the different flavours.

The human process of mastication is difficult to measure, but new understanding of how we eat and how food is experienced will go a long way to making food products healthier and even more enjoyable. While we can't see and measure much of what is happening in the mouth during mastication, a new 'virtual mouth' might provide some answers about how food structure leads to perception of flavour and texture.

To this end, CSIRO has developed the world's first 3D dynamic computational model of food breakdown and flavour release. This model can predict how the structure of a food product breaks down in the mouth, how taste and aroma components are released, and how the food/bolus structure changes during mastication.

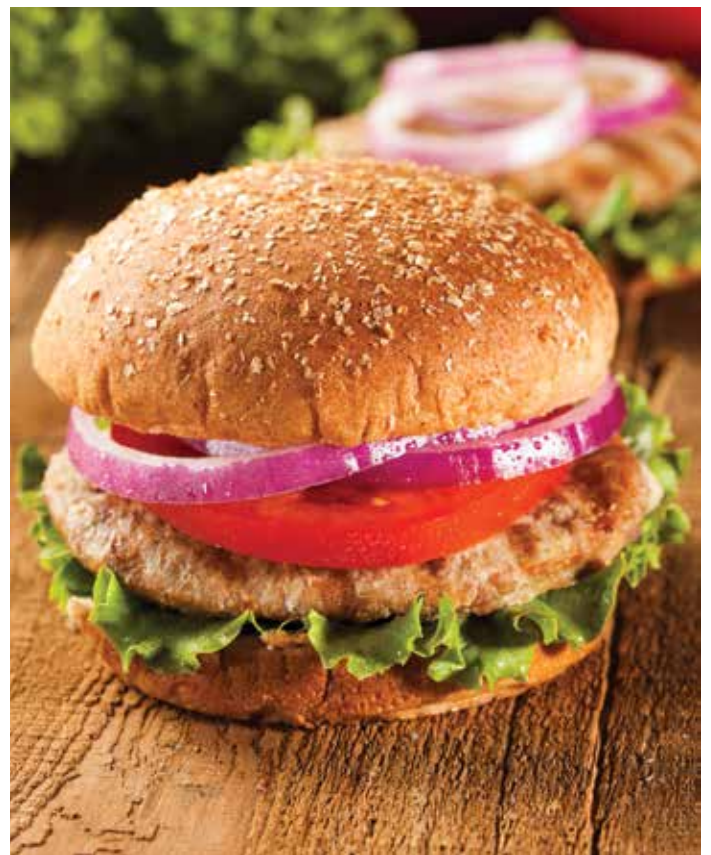
Hard nut to crack

Take the simple example of a salted peanut. When we place one in our mouth we use our tongue to position it between the top and bottom molars for chewing. Before we have even started chewing, salt crystals have been transferred from the peanut onto our tongue. The salt dissolves in saliva and the brain perceives saltiness.

Once we start chewing, the peanut is quickly broken into small pieces that fall around the teeth and gums. These pieces mix with saliva while more salt is released into the saliva. Small peanut pieces and saliva form a paste-like mass. The tongue collects the food fragments and fashions a bolus, which we then swallow. Small amounts of the food stuff remain in the mouth, releasing further flavour. Much of the salt that was in the original peanut is not experienced as flavour; that is, we swallow it without even tasting it. In theory, this excess salt could be removed without affecting the flavour of the peanut.

Food and flavour

Even this simple example raises some complicated questions, such as, where on the peanut should the salt be located to



maximise the flavour perception? How does cooking (or other processing) of the peanut affect how it breaks apart and releases salt? How do different people's chewing styles alter the answers to these questions?

These questions are difficult to answer because we can't observe and measure what is happening throughout the mouth during normal chewing, especially on the micrometre scale. This means that computer modelling of mastication is extremely difficult. Each of the physical and chemical processes, such as crushing of solid food by the teeth or the dissolution of salt in saliva, can be represented by mathematical equations, but solving these equations for realistic conditions requires relatively new computational modelling methods.

The challenges for the mastication model include:

- Representing the shapes and the movements of the teeth, tongue, soft and hard palate
- Simulating large elastic deformation of solid food, and ductile or brittle breakdown
- Calculating the mixing of solid and liquid components and the softening of hard food by saliva absorption
- Modelling how taste and aroma chemicals are released from food particles and how this changes as the food is broken apart and wet by saliva.

Addressing all of these issues requires cutting-edge techniques in physics, mechanical engineering and computational mathematics and that's what CSIRO's 3D computer modelling aims to deliver.

See page 20 for a detailed description of the workings of the model.

Reformulation and new product development

It is anticipated that the mastication model will be used to reduce the time and effort required to reformulate new foods. It will be possible to input many formulation variants in the chewing model and then evaluate the texture and flavour release and predict flavour experiences, without going to the expense of formulating the product, manufacturing prototypes or performing sensory panel experiments. Changes to food structure can be easily made without

needing to prototype new formulations each time. This will help guide the development of new food products and cut down time and cost in the new product development process.

The model also helps further our scientific understanding of how reformulations, such as ingredient changes and reduction of salt, sugar or fat affects the complete chewing process. This approach can be used to design healthier food with reduced salt and sugar but also create new food designs with new textural and flavour experiences.

The virtual food masticated by the mouth model can be any material properties and shape and with no restrictions

“ The virtual food masticated by the mouth model can be any material properties and shape and with no restrictions on locations of flavour compounds and structure ”

on locations of flavour compounds and structure. Without requiring time to prototype food products in the factory or test kitchen, we can assess the virtual food design and modify it by small or large degrees towards exciting new consumer eating sensations.

This new understanding informs the design process of new products much more than would be possible without the computer model.

In combination with their food processing, food safety and consumer and sensory expertise, CSIRO aims to use this model to not only make product development more efficient but also optimise the use of individual or expensive ingredients such as flavours, without affecting the product quality.



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The virtual mouth

CSIRO's 3D dynamic computational model predicts how the structure of food breaks down and how we detect taste and aroma as we eat. It is based on a computational method called smoothed particle hydrodynamics (SPH). The food, saliva and anatomical structures are represented by a large number of particles that move as allowed by the relevant mathematical equations of physics. The particles representing the surfaces of the anatomical structures (e.g. the teeth, tongue and gums) move according to their biomechanical behaviour. The particles representing the food can move, stretch and break according to equations of elastic, plastic and brittle solid mechanics. The particles that represent volumes of saliva and liquid food can move, splash, fragment and mix according to equations of fluid dynamics.

Solving just one of these sets of equations can be difficult, but SPH allows each of these equations to be solved simultaneously. This ability to represent such different phenomena at the same time is a key strength of the model. Outputs of the model include measurements of the 3D positions and sizes of all food fragments, saliva volumes and taste concentrations at any time during the chewing cycle. In the future, CSIRO plans to relate these measures to sensory measures such as saltiness, creaminess and

graininess, as the model is developed further.

Model set-up

The set up of the virtual mouth model is shown in Figure 1. The bottom teeth, gums, tongue and cheeks move relative to the top teeth and gums and the palates. Particles represent these surfaces and move individually according to the movements and deformation of each structure. The model represents food structures, such as a caramel-filled chocolate, by 50,000 or more SPH particles. It treats the particles located within the volume of the chocolate as a solid, and assigns them the stiffness and breakdown behaviour of solid chocolate. The particles located within the volume of the caramel filling are treated as a liquid and assigned the viscosity of caramel.

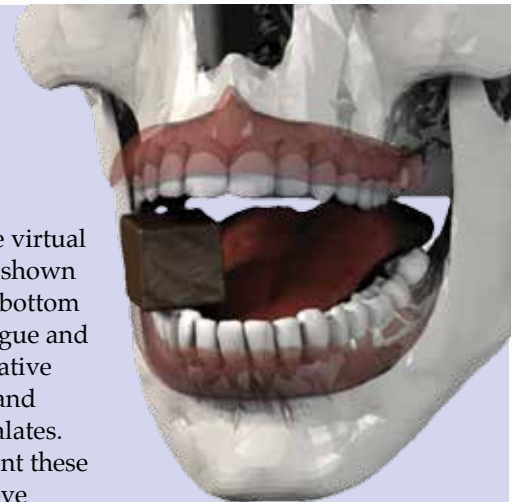


Figure 1: The set-up of the CSIRO mastication model.

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SPH also calculates the chemical concentration of a tastant such as sugar for every particle. It solves a diffusion equation between all particles, which predicts the transfer of taste and aroma molecules within the food and saliva. As a particle with a high sugar concentration value (e.g. chocolate or caramel) interacts with a particle of low sugar concentration (e.g. saliva), the transfer of sugar from the chocolate or caramel to the saliva phase can be calculated.



Figure 2: Simulated mastication of a caramel-filled chocolate.

Simulation results

Results from an example simulation are shown in Figure 2, using the cube-shaped caramel-filled chocolate from Figure 1. Once the simulation begins the chocolate falls under gravity onto the bottom teeth and tongue. As the jaw closes, the top teeth make contact with the chocolate and cause it to compress and deform. Once the deformation is large enough to cause fracturing, the edge of the chocolate cube cracks. As the jaw closes further, the crack opens and the chocolate shell collapses into a number of individual pieces. As the chewing cycle continues, the chocolate pieces are reduced in size and mixed with the caramel.

This example shows the capability of the model to represent:

1. Complicated anatomical movements of the tongue, teeth, cheeks and gums
2. The breakdown behaviour of a brittle food (chocolate)
3. The flow of a liquid (saliva)
4. The coupling between each of these components.

The CSIRO mastication model is able to handle a wide range of food materials from liquids, semi-solids to solids. Papers on the model have been published in European Food Research and Technology and the Journal of Texture Studies.

Simon Harrison is a biomechanical engineer with CSIRO.



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SUPPORTING WEIGHT LOSS WITH SOLUBLE FIBRE

Science has shown benefits of polydextrose for weight management. The challenge ahead is to persuade consumers to eat it.

Words by Alvin Ibarra



Each year millions of adults worldwide decide to go on a kilojoule-controlled, weight management diet – and a very large number fail. The NPD dieting monitor, which has tracked dieting habits for the past three decades, indicates that 50 million people in the United States started a diet in January 2012 and more than 40 per cent had given up before six months have passed.

According to Dr Jessica Bartfield, weight-loss specialist at Loyola Center for Metabolic Surgery & Bariatric Care in Illinois, USA, just 20 per cent of people manage to lose weight and then maintain it.¹ With global figures showing 35 per cent of adults aged over 20 are overweight, and another 11 per cent are obese, it

is clear that there is a need to rethink our approach to weight management.

Global food manufacturers have an important role to play with food products that help consumers control their kilojoule intake more easily and consistently.

Fibre for promoting satiety

Satiety is a relatively new focus area for the food industry. As a result, a new category of food and beverage products is emerging, positioned to minimise hunger between meals, reducing the desire to eat and resulting in lower energy intake.

In many cases, these products are also high in protein and reduced in sugar and fat. The advantage of the fibre and protein is that consumers can immediately feel

a tangible benefit – a sustained feeling of fullness that discourages snacking – driving repeat purchases and product loyalty. This, along with the kilojoule-reducing low sugar and fat levels, can help consumers towards the desired weight loss.

Polydextrose is one such fibre attracting increasing interest. It is a low-kilojoule highly branched-chain glucose polymer that is poorly digested in the upper gastrointestinal tract and therefore demonstrates fibre-like properties. Fibre has been shown to increase satiety and possibly reduce food intake.

Consumer understanding of fibre benefits

As many in the food industry have discovered, the journey towards market success for a fibre-enriched satiety product is typically fraught with difficulty. Consumer attitudes are often a major challenge. For this reason, DuPont Nutrition and Health partnered with global research firm Lindberg International to map consumer perceptions of fibre and its contribution towards a healthy lifestyle. A total of 3,500 adults aged 18 to 60+ responded to the survey across seven countries including Australia, Brazil, France, Germany, Italy, the UK and the US.

The survey found that more than half of the respondents named 'high fibre' as one of the important nutritional criteria that influence food-purchasing choices. Not only that, the respondents displayed a

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Among nutrition scientists, there is a general belief that fibre intake is able to reduce short-term energy intake by adding bulk and viscosity



fairly high awareness of fibre-associated health benefits. 'Good for heart health', 'Good for digestion' and 'Good for weight management' were all frequently mentioned – where satiety is acknowledged as a weight management factor. More than 50 per cent stated that they have experienced a positive sense of fullness after consuming fibre-enriched foods.

Daily fibre consumption is still too low

Despite this high-level recognition of the benefits of fibre, the picture regarding average daily consumption is less bright. In Western Europe, for example, consumers not only admit to consuming less than the recommended 25g of fibre a day, but the majority are not even aware of the official daily recommendation. Among the 83 per cent of respondents that claim to be aware of their actual fibre intake, just 20 per cent consider that they consume enough.

These findings leave no doubt that most consumers know that fibre is good for them – and that they should consume more.

Reduction in short-term energy intake

Among nutrition scientists, there is a general belief that fibre intake is able to reduce short-term energy intake by adding bulk and viscosity. The additional bulk is responsible for lowering the energy density of food products, while viscous soluble fibres are thought to prolong the phase of nutrient digestion and absorption in the intestine. As the body generates satiety signals both before and after absorption, this may explain why consumers experience a longer lasting sense of fullness.

Other mechanisms that link fibre to reduced energy intake include prolonged gastric emptying, prolonged mastication, low glycaemic response and influences on gut satiety hormones.

Polydextrose in a mid-morning snack

Four clinical studies have measured the impact of polydextrose on satiety with the overall conclusion that it is effective from a dose of 6.25g and up.

Of the four published clinical studies of polydextrose and satiety, the first, led by Professor Neil King, studied

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the impact of a mid-morning yoghurt snack on satiety and energy intake during a subsequent ad libitum meal.² During the course of 10 days, the study measured the energy intake of 15 volunteers who received a pre-meal snack with or without polydextrose. The results show that polydextrose consumption led to lower lunchtime energy intake, gave a higher sense of fullness and delayed postprandial feelings of hunger.

In 2012, Dr Sarah Hull headed a study with three yoghurt-based drinks containing varying doses of polydextrose.³ Again, consumption of it in a mid-morning snack had a positive impact on energy intake and satiety during a lunchtime meal served 90 minutes later. At a 12.5g dose, it reduced energy intake by 6.8 per cent compared to the control – a reduction not compensated for later. Over an entire day, a single dose of 12.5g stimulated a more than three per cent drop in energy intake. The research team also found that satiety was increased and appetite reduced when the dose was halved to 6.25g.

The findings of a third study conducted by Dr Viren Ranawana at the Oxford Brookes University in the UK were published in the *European Journal of Nutrition* in 2012.³ Here, two fruit smoothie beverages were tested. The control product was a standard commercial fruit smoothie. This was also the base for the test product, which contained an additional 12g (three per cent) of polydextrose.

Supporting the previous studies, the consumption of the polydextrose-containing smoothie resulted in significantly lower energy intake at the ad libitum lunch – 10 per cent less than the control. Overall, the participants consumed much less carbohydrate, protein, fat and fibre, and a trend towards decreased hunger levels was observed. Ranawana's study team concluded that polydextrose has the potential to reduce food intake and could be useful in appetite control.⁴

Dose-dependent impact

The most recent study, conducted at the University of Nottingham under the leadership of Nerys Astbury, was published by the *British Journal of Nutrition* in early 2013.⁵ To investigate the effect on appetite and energy intake when consuming a range of doses of polydextrose, the study recruited 21 participants – 12 male, nine female – and employed a randomised, single blinded, crossover design.

Each participant was required to consume a chocolate-milk drink containing 0g, 6.3g, 12.5g or 25g of polydextrose before being served an ad libitum pasta-based test meal. In all cases, energy intake was significantly lower among participants who had received a polydextrose dose in the pre-meal drink, compared to the 0g control, the 25g dose giving the highest reduction.

Total daily energy intake – accounting for breakfast, the pre-meal drink, test meal and remainder of the day – was considerably higher among those who received the 0g polydextrose control. Those participants who had consumed it in the pre-meal drink reported no differences in energy intake during the remainder of the day, regardless of the fibre dose they had received. Based on these findings, the Astbury study concluded that polydextrose has a dose-dependent influence on short-term energy intake and may be a beneficial ingredient in weight management products developed for reduced energy intake.⁴

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Invisible fibre addition

The consistent results of all four studies are a strong indication that, as a soluble fibre, polydextrose enhances satiety and reduces energy intake, potentially contributing to weight loss. Unlike many other dietary fibres, it offers the additional advantage of a neutral sensory impact, enabling fibre addition to foods and beverages without altering taste or texture. Could this be the encouragement that consumers need to overcome their reluctance and include more fibre in their diet? If so, polydextrose holds many opportunities for manufacturers to create new, reduced kilojoule products or reformulate existing ones.

“ The consistent results of all four studies are a strong indication that, as a soluble fibre, polydextrose enhances satiety and reduces energy intake ”

Next level of weight management?


Despite cutting the kilojoules in their diet and increasing physical exercise, for some consumers the battle with excess kilos still seems unwinnable. One new avenue of research indicates that gut microbiota may play a more important role in obesity and metabolic syndrome than previously thought. A series of animal studies has shown that gut microbiota may actually give individuals a predisposal to obesity.

Working alongside leading scientists, DuPont is now exploring possibilities to use probiotics or probiotic-prebiotic combinations to encourage the growth of alternative gut microbiota that are less likely to result in obesity or help maintain a healthy weight. Early research in this area shows real promise – a hint that probiotic and prebiotic ingredients could be the ingredients that take weight management claims to a new level in the future. 

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Dr Alvin Ibarra is senior scientist of Active Nutrition, DuPont Nutrition & Health.



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READING FOOD SAFETY ADVICE ON LABELS

Consumer understanding of food safety on labels advice is improving but there is still room for improvement.

Words by Lydia Buchtmann and Patricia Desmarchelier



There has been a lot of interest in recent years about how consumers understand and use the nutrition information on food labels to assist them in making healthier food choices. However, the food safety components on food labels, such as 'use by' and 'best before' dates, as well as cooking and storage instructions, have received less attention. This is despite the fact that this labelling, if followed correctly, plays an important role in reducing the risk of foodborne illness.

Current requirements

The Australia New Zealand Food Standard Code requires nearly all packaged food to have date marking. There are some minor exceptions,

for example bread can have a 'baked for' or 'baked on date'. A food must have a use-by date if the food must be consumed by that date for health and safety reasons. If not, it should have a best-before date indicating the expected duration of the quality of the food, unless the best-before date of the food is two years or more.

Foods with a use-by date cannot be legally sold after that date nor should they be consumed, while foods with a best-before date can be sold and consumed for a short period after that date, but they may have lost some nutrition or quality.

The food business attaching the label is responsible for deciding whether a use-by date or a best-before

date is needed as well as what the actual date will be. This is because the manufacturer or supplier of the food best understands the shelf life of their product. The food manufacturer or supplier is also responsible for including directions for the use or cooking instructions on a food label if there are health or safety reasons.

Ignoring use-by dates or cooking and storage instructions when preparing food can be a food safety risk. For example bacteria can grow quickly in food that should be refrigerated if it is left in the temperature danger zone between 5°C and 60°C or bacteria may not be inactivated if the cooking process was inadequate for that product. In Australia in 1998 there was



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a *Salmonella typhimurium* outbreak linked to raw chicken nuggets where consumers were not following cooking instructions and reheating the product in the microwave, assuming the nuggets were pre-cooked.

In the US, during 2009, the Centers for Disease Control reported that 76 people from 31 states had been infected with an indistinguishable strain of *E. coli* O157:H7 after not following cooking instructions and eating the raw frozen cookie dough. Thirty-five people had been hospitalised, including 11 with haemolytic uremic syndrome.

Australian Newspoll research October 2013

The Food Safety Information Council (FSIC) recently commissioned Newspoll to determine consumer use of the food safety information on food labels. Survey respondents were asked the following questions:

- Would you say you read the following types of food labels always, most of the time, occasionally or never? Best-before dates/use-by dates/storage instructions (such as 'keep refrigerated under 5°C')/cooking instructions.

And if they said they read labels:

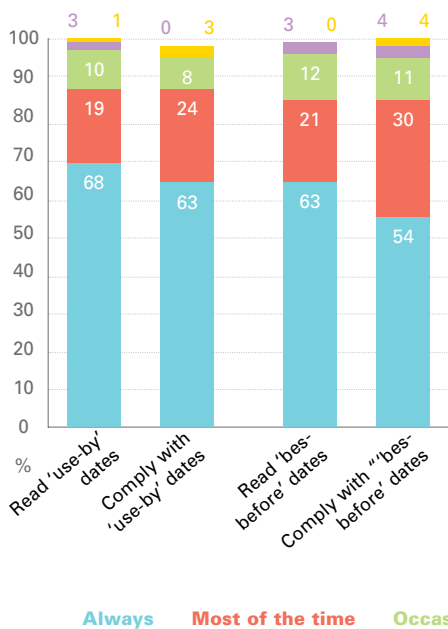
- Would you say you comply with the following advice on food labels always, most of the time, occasionally or never? Best-before dates/use-by dates/storage instructions (such as 'keep refrigerated under 5°C')/cooking instructions.

Date marking findings

Only 3% of those surveyed reported that they never read use-by or best-before dates. 68% always read use-by dates and a further 19% read them most of the time. 63% always read best-before dates and a further 21% read them most of the time (Figure 1).

Of those who read the date marking, none said that they never complied with use-by dates but 4% said they never complied with best-before dates. 63% always complied with use-by dates, 24% complied with them most of the time and 8% occasionally complied. 54% always complied

Figure 1: Frequency of consumer self-reporting on whether they read and comply with use-by and best-before date marking on foods in Australia 2013. Base: total sample (N=1201).

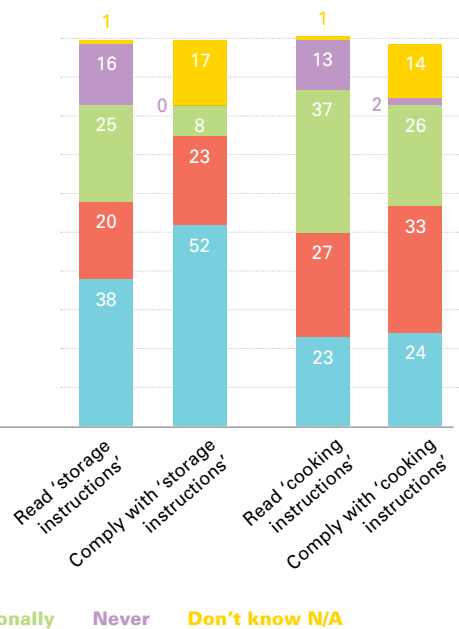


with best-before dates, 30% complied with them most of the time and 11% occasionally complied.

The higher rate of reading of and compliance with use-by dates possibly indicates an awareness that ignoring a use-by date was likely to be more of a food safety risk than ignoring a best-before date.

“ The higher rate of reading of and compliance with use-by dates possibly indicates an awareness that ignoring a use-by date was likely to be more of a food safety risk than ignoring a best-before date ”

Figure 2: Frequency of consumer self-reporting on whether they read and comply with storage and cooking instructions on food labels in Australia 2013. Base: total sample (N=1201)



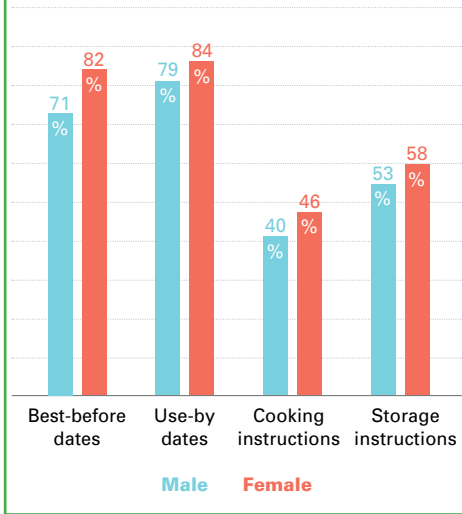
Cooking and storage instructions findings

The number of respondents who never read storage or cooking instructions was concerningly high, with 16% never reading storage instructions and 13% never reading cooking instructions. 38% always read storage instructions, 20% read them most of the time and 25% read them occasionally. 23% always read cooking instructions, 27% read them most of the time and 37% read them occasionally (Figure 2).

Of those who read instructions, none said that they never complied with storage instructions but 2% said they never complied with cooking instructions. 52% always complied with storage instructions, 23% complied with them most of the time and 8% complied with them occasionally. 24% always complied with cooking instructions, 33% complied with them most of the time and 26% complied with them occasionally.

This is quite a large number of respondents reporting that they did not either read or comply with cooking or storage instructions.

Figure 3: Frequency of male and female consumer self-reporting on whether they read and comply with date marking and handling instructions on foods in Australia 2013.



71% of male respondents, reporting they would always or most of the time read and comply with best-before dates (Figure 3). Female respondents were 5% more likely than male respondents to always/mostly read and comply with use-by dates, 6% more likely with cooking instructions and 5% more likely with storage instructions. This may not be surprising as the majority of grocery buyers and home cooks still tend to be female.

When broken down by age groups, 18 to 34 year olds were more likely to always/mostly read and comply with use-by (86%) and best-before dates (81%) than older groups (Figure 4). Whereas over 50 year olds were more likely to always/mostly read and comply and with storage instructions (61%) than younger age groups.

There were no significant differences by education level or capital/non-capital city.

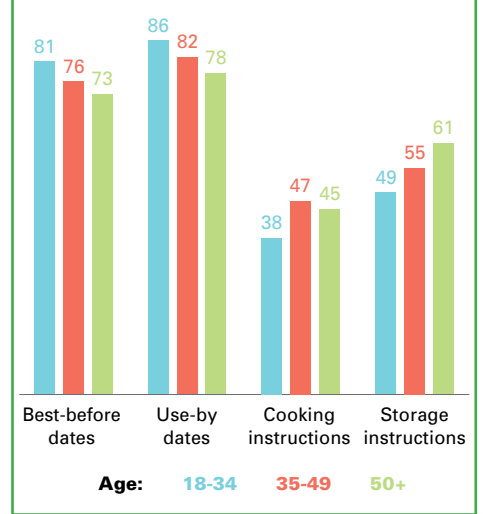
Demographic differences

In previous research, the Council found some demographic differences in behaviour by gender, educational level or living in a capital city or outside a capital city. The greatest difference in this survey was in gender with 82% of female respondents, compared with

Improving but still cause for concern

It was pleasing that in this survey, far more respondents reported that they read food labels with only 3% never reading use-by or best-before dates,

Figure 4: Frequency of consumer self-reporting on whether they read and comply with date marking and handling instructions on foods and their age group in Australia 2013.



16% never reading storage instructions and 13% never reading cooking instructions. When amalgamating those who always/mostly read and complied with use-by dates (82%) and best-before dates (76%), results were even better but there is still considerable room for improvement.

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“The Council has used the results of this research as part of its educational activity to encourage consumers to read these important food safety components of food labels”

It was concerning that only 43% of respondents reported they always/mostly read and complied with cooking instructions and only 56% with storage instructions as these are both important means of reducing the risk of foodborne illness.

The Council has used the results of this research as part of its educational activity to encourage consumers to read these important food safety components of food labels. Follow up to this Newspoll

survey will be made to track any future changes to consumer reported behaviour.

The Food Safety Information Council (FSIC) is a non-profit organisation and is Australia's leading disseminator of community targeted food safety information.

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Lydia Buchtman is FSIC's campaign convenor and was a founding member in 1997. She headed the communication and stakeholder engagement section of Food Standards Australia New Zealand (FSANZ) from 1997 to 2010 and is currently a consultant with Futureye.

Dr Trish Desmarchelier is FSIC's technical convenor and has been a member since 2011, representing the AIFST. She has considerable experience in the food safety area working at the interface between science and public health. Trish has worked in academia and CSIRO and is currently a consultant in food safety in her own business, Food Safety Principles.



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INDUSTRY INITIATIVES TO MANAGE FOOD ALLERGENS

Food allergens are a food safety issue that is here to stay. So how is industry proactively tackling the challenge?

Words by Lyn Davies

Mandatory labelling of food allergenic ingredients is a responsibility Australasian food manufacturers take very seriously. The industry works closely with consumer groups and regulators, including Allergy & Anaphylaxis Australia, Allergy New Zealand, Coeliac Australia, Coeliac New Zealand and Food Standards Australia New Zealand (FSANZ), to provide meaningful information to help consumers manage their special dietary needs.

As part of this commitment, the Australian Food and Grocery Council (AFGC) established the AFGC Allergen Forum 10 years ago. The forum is made of member companies of the AFGC which focus on addressing allergen management issues, including several that remain relevant to the Australasian food industry today.

Allergen Bureau

Arguably the most significant step in the forum's approach to this issue has been the establishment of the Food Allergen Resource Bureau (now the Allergen Bureau) in 2005, a joint initiative by the AFGC and the Australian Food Safety Centre of Excellence.

The Allergen Bureau is a not-for-profit organisation that operates on a membership basis. The purpose of the Bureau is for members to share information and experience on the management of food allergens to ensure consumers receive relevant,

consistent and easy to understand information on food allergens. It is an excellent example of cooperation among competitors in the food industry.

The Allergen Bureau has established several valuable tools that help the industry deliver best practice allergen management and labelling without adding undue compliance costs.

One such tool is the Voluntary Incidental Trace Allergen Labelling (VITAL framework), which was

“Precautionary labelling based on quantitative action levels provides optimal protection for allergic consumers – an approach that is supported by the body of data on minimum eliciting doses, as well as developments in risk assessment methodologies”

launched in 2007, as part of the revised AFGC Food Industry Guide to Allergen Management and Labelling.

Developed to provide a risk-based methodology for food producers to use in assessing the impact of allergen cross contact and provide appropriate

precautionary allergen labelling (i.e., may be present), VITAL aims to avoid indiscriminate use of precautionary labelling and thereby preserve its value as a risk management tool.

To put it in context, in addition to named allergens present in a food due to direct, intentional addition, allergens may also be present, even under conditions of Good Manufacturing Practice (GMP), due to cross contact with other materials. This could occur at any point along the food chain from primary production, secondary ingredients and through the manufacturing process.

The VITAL calculator provides users with a two-level action grid to assist in determining if the presence of residual protein from allergenic substances through unavoidable cross contact requires a precautionary labelling statement.

In a collaboration between the Allergen Bureau, Food Allergy Research & Resource Program (FARRP) of the University of Nebraska and the Netherlands Organisation for Applied Scientific Research (TNO), the Allergen Bureau established in 2011 an expert scientific panel to review the VITAL action levels and ensure they are consistent with the latest scientific evidence regarding minimum eliciting doses of each of the eight regulated allergens. The panel consists of international scientists specialising in allergen management, food allergy and risk assessment and, as a result of



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the exposure to international experts on the panel, VITAL is now gaining global attention.

Precautionary labelling based on quantitative action levels provides optimal protection for allergic consumers – an approach that is supported by the body of data on minimum eliciting doses, as well as developments in risk assessment methodologies.

The ultimate aim of the Allergen Bureau's work with VITAL is a globally standardised precautionary labelling scheme. In order to achieve this, the Bureau appreciates there is significant work required to gain agreement from all stakeholders as well as to educate consumers and health professionals.

As the result of risk assessment work initiated by the Allergen Bureau, in May 2014 FSANZ released an administrative assessment report for its proposal to allow for specific exemptions from allergen declarations for highly refined ingredients including glucose syrups derived from wheat starch, fully refined soy oil, soy derivatives (tocopherols and phytosterols), and distilled alcohol from wheat or whey. The Allergen Bureau's

work demonstrated that the allergen risk is removed from these ingredients in the refining process. In this instance, exemption from allergen labelling is likely to improve food choices for those with allergy without reducing safety.

Allergen Collaboration

In other measures aimed at improving food choices for allergic consumers, FSANZ established the Allergen Collaboration in late 2011 to strengthen engagement and collaboration among a range of stakeholders involved in managing food allergens.

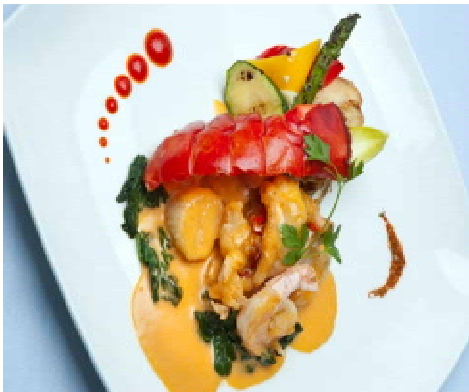
The Collaboration was established following an allergen review, conducted by FSANZ, which sought to determine whether, in the context of current scientific knowledge, improvements could be made to existing regulation to improve food choices for consumer with food allergy without compromising safety.

Members of the Collaboration, including food manufacturing, consumer and government representatives, are currently exploring non-regulatory measures that may help improve the management of food allergens.

The collaborative efforts of the Australian and New Zealand food industry, consumer groups and regulatory bodies over the past decade have found a spotlight on the world stage. However, there is much more to do yet in order to establish global allergen labelling consistency that will lead to improved food choices for those affected by food allergies.

As the incidence of food allergies continues to rise around the world, especially in developing nations, the issue of allergen management for the food industry is here to stay.

Lyn Davies consults to the Allergen Bureau, a membership-based organisation providing valuable tools that help the industry deliver best practice allergen management and labelling without adding undue compliance costs. For more information, visit www.allergenbureau.net.



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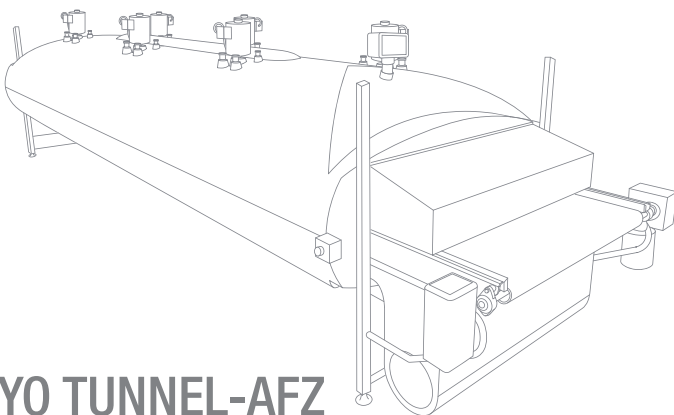
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FOOD RECALL PROTOCOL

The latest edition of the FSANZ Food Recall Protocol includes new sections on communications and traceability and removes the term 'voluntary recall.'

Words by Lorraine Belanger

Every year in Australia there are, on average, 58 food recalls, and knowing how the recall system works, what to do, who to call, and when to take action is important for every business in the food system, from the smallest to the largest.

Recalls occur because of food safety issues, which can range from the presence of harmful bacteria to undeclared allergens or the presence of foreign matter. Regardless of the food safety issue, when a problem like this is identified food needs to be removed quickly and efficiently from the supply chain, retail shelves and people's homes.

Food Standards Australia New Zealand (FSANZ) has recently published the 7th edition of the Food Industry Recall Protocol, which helps food businesses ensure they are prepared for a food recall and provides clear information about how the recall system works.

The protocol takes businesses step-by-step through the system, including explaining when a recall needs to happen (as opposed to a withdrawal of food or other action) and outlining our role in the process – as a coordinator for all recalls on behalf of the state and territory food enforcement agencies.

The new edition can help businesses write a food recall plan and keep it up to date so they are prepared if a recall is needed. It includes information on the roles and responsibilities of food businesses and government during a food recall, the key steps in the recall process and the legal requirements in relation to recalls.

The latest edition has updated information including revised



templates, new suggestions on communicating recalls to the public, a new section on traceability and the removal of the term 'voluntary recall'.

Communication: In the case of communication, things have changed significantly since our last edition of the protocol. Traditional media, like newspapers and radio, are still important for reaching consumers in the event of a recall, but social media platforms like Facebook and Twitter now offer businesses an affordable

and quick communication channel to reach their customers. The protocol recommends using these, if possible, to extend the reach of communications.

Traceability: The ability to track any food through all stages of production, processing and distribution (including importation and at the retail level) is also vital when there is a food safety issue. During a food recall, the business recalling the food is required to urgently notify all customers it has supplied the food to.

Because an effective traceability system relies on being able to track product one step forward and one step back at any point in the supply chain, food businesses should have systems in place to enable them to trace their products – for example, an electronic system identifying producers, suppliers, customers and products.

Removal of voluntary recall: One of the other changes to the protocol was the removal of the reference to the term ‘voluntary recall’.

This term caused confusion with consumers and some businesses who interpreted a ‘voluntary recall’ as meaning they had a choice about taking action. The reality is that if there is a safety issue with food then the food needs to be recalled.

Using the protocol

The FSANZ protocol steps businesses through the recall process and how it works. For example, if a business has a food safety issue with a food that the business has either produced or imported and the food may need to be recalled, the first contact should be with the health department or food authority in the state or territory in which their head office is located.

If it is decided that a food needs to be recalled, the business should contact FSANZ and we will step them through their legal obligations and the recall process. FSANZ also provides other recall guidance and template documents to help businesses.

and General Requirements of the Food Standards Code.

This requirement applies to all businesses engaged in the wholesale supply, manufacture or importation of food. It is envisioned that food businesses will be able to modify

“ *Traditional media, like newspapers and radio, are still important for reaching consumers in the event of a recall, but social media platforms like Facebook and Twitter now offer businesses an affordable and quick communication channel to reach their customers.* ”

For a quick introduction to the recall process, a YouTube video is available from the FSANZ website. It explains to businesses what they should do when they need to undertake a recall, including who to contact and when, and other obligations.

Food recall plan

FSANZ is also currently developing a template to provide more help for food businesses when writing a food recall plan, as required by clause 12 in Standard 3.2.2 – Food Safety Practices

these templates to suit their individual business needs. This guide is expected to be completed later this year and will also be available from the FSANZ website.

The FSANZ Food Industry Recall Protocol is available at www.foodstandards.gov.au/industry/foodrecalls.

Lorraine Belanger is manager of communication and stakeholder engagement at Food Standards Australia New Zealand (FSANZ).



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WA'S UNIQUE APPROACH TO FOOD TESTING

The integrity of food ingredients has never been more in the spotlight. We take a look at a unique and highly coordinated system running in Western Australia.

Words by *Susanna Morley-Wong*

While the media has moved on from the fake food scandals in Europe, the heat is still on to verify and assess the origins and purity of food ingredients behind the scenes. In Australia, this responsibility almost always falls on Local Governments Authorities (LGAs) but just how does a local authority divide its time and resources across the thousands of food items for sale in its area?

To ensure the integrity of the food supply, LGAs are usually responsible for responding to high-risk foods and issues of compliance, but choosing the right targets across the range of foods available across a whole state can be a hit-and-miss process. While all states and territories in Australia carry out surveys of food samples and keep databases of their compliance accuracy and level of risk to public health, Western Australia has a uniquely coordinated approach.

The Local Health Authorities Analytical Committee (LHAAC) was established under the 1911 Health Act for the purpose of providing analytical services to Western Australian local governments.

For the past five decades, LHAAC has offered a subscription-based service that ensures a broad range of food products and food premises across the state are tested regularly. Its remit is to regularly liaise with local governments, the Department of Health, the appointed analyst and other stakeholders in public health and food industries on matters

pertaining to food hygiene and safety.

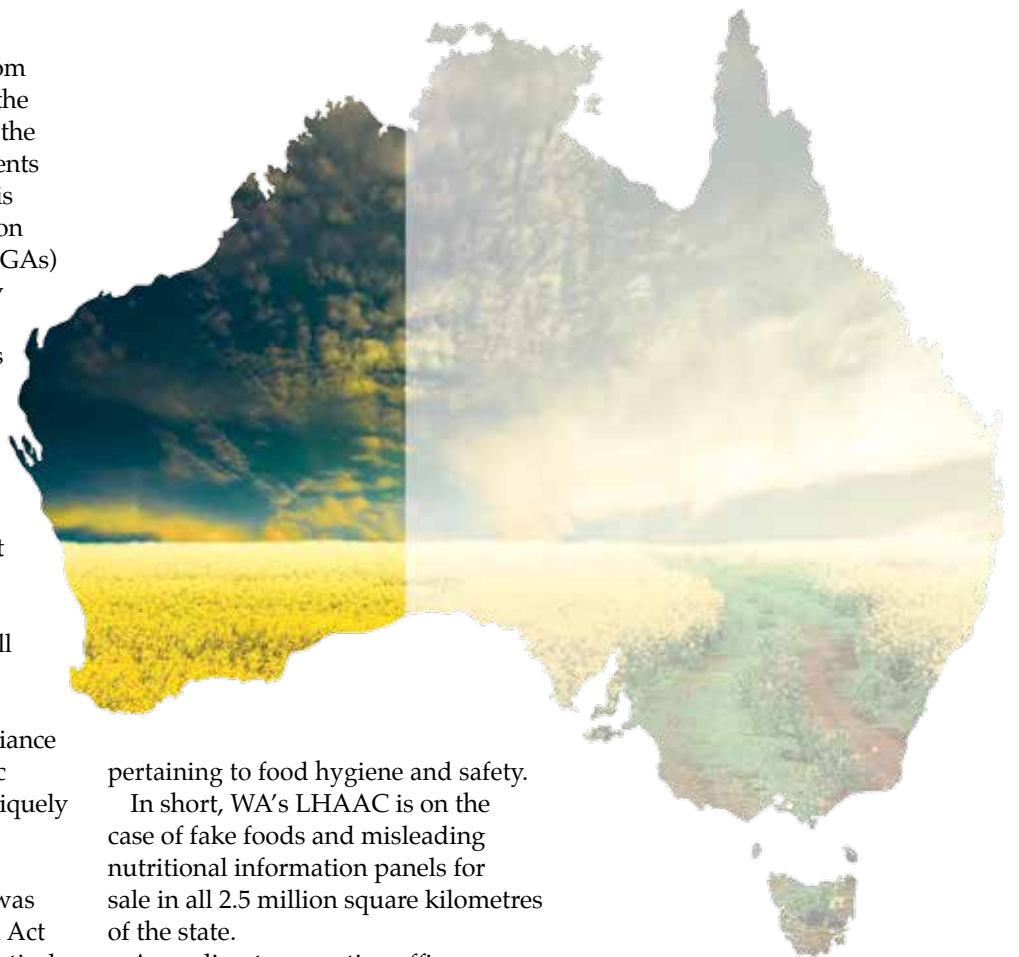
In short, WA's LHAAC is on the case of fake foods and misleading nutritional information panels for sale in all 2.5 million square kilometres of the state.

According to executive officer and coordinator for LHAAC, Trevor Chapman, this coordinated system avoids duplicate testing and spreads the cost of chemical testing of food products between the LGAs using a population-based formula.

"No other state or territory in Australia runs a coordinated scheme on the same scale. LGAs elsewhere often do not cover all their bases each year when it comes to food testing," he said.

Food sampling schemes are certainly run in other states. For instance, NSW runs a voluntary scheme where testing is funded by the state. However, the beauty of the LHAAC scheme is the fairness of its administration and the spreading of the costs.

"A council with a high number of food premises but a low population may not have the resources to carry out significant testing and may



unwittingly double-up on simpler testing procedures with other LGAs.

“Our system directs sampling targets and gathers data from a wide range of samples and we do the leg work when it comes to sorting out who tests what and who pays for those tests,” said Chapman.

The LHAAC sampling program runs annually from July to June and is responsive to needs within the local government, trends in the industry and evidence of risk or non-compliance.

In 2012, LHAAC conducted a survey to compare compliance levels of local goods to imported foods. LHAAC directed 27 LGAs to sample a total of 355 local food products including noodles, sauces and dried products. The survey assessed the accuracy and compliance of the Nutrition Information Panels (NIP), including font size, legibility and a full nutritional analysis.

The results showed that 51.5 per cent of imported goods were found to be non-compliant compared to 30.4 per cent of local goods. The largest areas of non-compliance in local goods related to inaccurate declarations of fat and sodium.

“This project was a huge success,” said Chapman. “Firstly, Environmental Health Officers saw value in the coordinated sampling project and secondly, they were given sufficient guidance by LHAAC in terms of the products they should be selecting for analysis.”

According to Joe Zappavigna, senior environmental health officer for the city of Fremantle and LHAAC committee member, the system works well with the state’s legal framework around how it looks after food.

“The LHAAC scheme is an all-in approach and has a 100 per cent level of participation, even in the smallest of shires – like Murchison, with a population of just 200.

“The feedback from each LGA gives confidence about the safety of the system across the state. The funding is allocated based on population rates but each LGA still has access to all sampling results and to sampling procedures for complaints regarding food as well as other forms of legal sampling,” said Zappavigna.

In fact, the sampling data from WA is considered to be so broad and so efficient that Trevor Chapman believes

it could be of great value to national health agencies such as the Cancer Council and the Heart Foundation, who up to now have had to rely on the manufacturer’s claims on NIP panels.

“We are considering a national benchmarking scheme for special claims by food manufacturers, for instance a low-GI or gluten-free claim. Health agencies have no budget to verify these claims,” said Chapman.

LHAAC continues to put pressure on manufacturers to lift standards on a range of food items across the state. Thanks to LHAAC’s statewide approach, you can be fairly sure that on your next WA road trip, there will be a minimum of 25 per cent meat content in your service-station pie whether you stop in Albany or Zanthus. 🍗

All LHAAC sampling projects and its results can be downloaded from its website, www.lhaac.org.au/sampling-results/current-year.

Susanna Morley-Wong is chef/technologist in the product development team at Tesco Foods and the editor of the WA AIFST Branch newsletter.



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THE RECIPE FOR PROTECTING YOUR VALUABLE ASSETS

Intellectual property is a tangible asset that can extend well beyond the branding and labelling of a product and help food businesses to maintain a competitive edge.

Words by Joanna Jones

Intellectual property is a key component in the recipe for success in today’s competitive food industry. It should be regarded as a valuable asset that can be used to support commercialisation and marketing of a product, as well as gain competitive advantage by restricting what competitors can do.

Broadly speaking, intellectual property (IP) is a term for a group of rights, provided for by law, that provide protection for “creative and intellectual effort”. Intellectual property rights fall into two primary categories: registrable and non-registrable rights.

Registrable intellectual property rights must be applied for, and include patents, registered designs and trade marks. In contrast, copyright and confidential information (so called “trade secrets”) arise automatically and fall under the category of non-registrable rights. In this article we will provide you with a quick insight into each of these rights and guide you on what to watch out for.

Identifying your intellectual property

The first step to protecting the creative and intellectual effort in a product is to identify your intellectual property and determine the most appropriate mode of protection.

Patents

A patent provides an exclusive and legally enforceable tool that can be

used to restrict the exploitation of an invention for a period of time.

Patents protect the functionality of an invention and can be granted for products, methods, apparatus, materials or processes that are novel and sufficiently inventive. Notably, not all inventions are patentable.

In Australia, exclusions to patentability include human beings and the biological processes for their generation, mathematical models, plans and schemes, and abstract ideas or concepts (although the practical implementation of the idea or concept may be patentable).

“ The owner of a patent has a monopoly, which provides the right to prevent others from exploiting the invention for the term of the patent... ”

The owner of a patent has a monopoly, which provides the right to prevent others from exploiting the invention for the term of the patent: 20 years for a standard patent and eight years for an innovation patent, which offers a shorter period of protection for incremental product developments. The owner of a patent can choose to exploit the invention themselves, or can license, transfer or sell the patent to others.

Food products

In order to be patentable, an invention must be new and not obvious in light of what is already known. Food products that are made using typical ingredients and using standard preparation techniques are unlikely to meet these requirements. Innovations in food technology, however, can result in new products that qualify as patentable inventions.

Examples of patented products include New Zealand company Cookie Time Limited’s patented meal bar, ‘One Square Meal’, which is marketed as the first nutritionally balanced food or beverage, as well as fat substitutes and artificial sweeteners and flavours.

Food manufacturing processes

Patents are also useful to secure protection for food manufacturing processes, particularly those inventive processes that would be impossible to keep secret.

As well as ensuring that your method for creating food is protected, thus making it difficult for competitors trying to imitate your product, process patents can also provide useful revenue streams through licensing patents to others within the food industry or beyond.

New Zealand ice-cream manufacturer, Tip Top, registered patents for the triple-layer dipping used for its Memphis Meltdown, and for placing large food chunks in ice-cream on a stick for its Moritz



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product. Mars Inc also patented the process 'Cocoapro' for producing cocoa flavanols for use in multiple products.

Food packaging

In addition to securing protection for new products and manufacturing processes, it is also possible to obtain patent protection for new and inventive packaging. For example, if the packaging provides storage advantages or improved delivery to the consumer, such as the Berocca Twist 'N' Go bottle or Tetra Pak's Tetra Evero Aseptic carton bottle for milk.

Patents: Watch out for

Public disclosure: Any demonstration, sale or discussion of an invention before the filing of a patent application may jeopardise the novelty of the invention.

Designs

A registered design protects the overall appearance of a product. Almost any type of manufactured product can be protected by a registered design, from food products to clothes to vacuum cleaners.

To be registrable, a design must be new in appearance; in other words, the appearance of the product must differ from that of existing products. Design rights provide protection not just for the appearance of the packaging of a product, for example the Berocca Twist 'N' Go bottle, but also to the appearance of a product itself, for example Guylian's shell-shaped chocolates.

The owner of a registered design that has been examined and certified has an exclusive and legally enforceable right to use, license or sell the design for a maximum of 10 years in Australia.

Designs: Watch out for

As with patents, any public disclosure may jeopardise a design application. Notably, registered design protection protects the overall appearance of a product only, and does not protect the functionality of the product when embodied in a product of different appearance.

Trade marks

Trade marks are the most frequently used, and widely known, form of intellectual property. They are typically a fundamental part of a branding strategy, and should be considered at the inception stage of a new product or service.


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services of one trader from those of another can be registered. The main requirement for registration is that a trade mark should be capable of distinguishing the goods or services to which the mark is applied. Trade marks that are simply descriptive of goods or services are typically difficult to register. Simply put, the more distinctive the trade mark, the easier it is to obtain protection.

Trade marks enable consumers to readily identify a product or service so that the brand can become a powerful and valuable business asset, helping to achieve and maintain market share.

A registered trade mark provides the owner with the exclusive right to use the mark in relation to particular goods and services within Australia. The owner also has the right to stop other people from using substantially identical or deceptively similar trade marks for the same class of goods or services, or similar and closely related goods or services. The owner can also choose to license, transfer and/or sell the trade mark to others. The registration term is 10 years and is renewable indefinitely upon payment of an official fee.

Examples of successful trade marks in the food industry include Cadbury's Freddo Frog which has registered trade marks for both the name and shape of the product, and the registered trade marks for Vegemite which include the 'Happy Little Vegemite' sound jingle.

Trade marks: Watch out for

You do not have to register a trade mark to have some rights to the mark, but it is usually advisable because proving your rights and taking action against an infringer without a registered trade mark can be a lengthy, expensive process.

Copyright

Copyright protects the original expression of an idea from copying and certain other uses. The original expression can be in the form of original works of art and literature, music, film, sound recordings, broadcasts and computer programs.

Copyright is free and automatic and no registration is required in Australia. Material is automatically protected from the time it is first written down, painted or drawn, filmed or taped.

Depending on the material, copyright generally lasts 70 years from the year of the author's death or from the year of first publication after the author's death. Copyright for films and sound recordings lasts 70 years from publication. Copyright for broadcasts lasts 70 years from the year in which the broadcast was made.

Copyright protects a range of materials, for example cookery books containing recipes, but also written recipes and manufacturing processes setting out a description of the type and amount of ingredients used and the method for making the food.



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Copyright: Watch out for

Although making copies of copyright material can infringe the owner's exclusive rights, a certain amount of copying is permissible under the fair dealing provisions of the legislation. Notably, copyright laws do not protect you against the independent creation of a similar work.

Confidential information

A trade secret is both a type of intellectual property, and a strategy for protecting your intellectual property. It can be a useful strategy for protecting proprietary knowledge and is commonly used in the food industry to protect recipes and manufacturing processes alike. Some of the most famous examples of trade secrets include the formula for Coca-Cola and the KFC original recipe of 11 herbs and spices.

Trade secrets: Watch out for

A trade secret should be protected by a signed confidentiality agreement. Trade secrets are not useful for products that can be readily reverse-engineered and copied by a third party.

Case study: Unistraw

The award-winning technologies of Australian company Unistraw International Limited are protected by a wide range of intellectual property rights. Unistraw's best known product is the Sipahh milk flavouring straw, which is available in a number of flavours in over 65 countries. It is designed to encourage children to drink more milk.

The functionality of the Sipahh milk flavouring straw is protected with patents, the appearance of the straw is protected with registered designs, and the brand itself is protected with registered trade marks.

“ Some of the most famous examples of trade secrets include the formula for Coca-Cola and the KFC original recipe of 11 herbs and spices ”

In summary, it is important to be aware that intellectual property in the food industry is not just for protecting the branding and labeling of a product. It is a tangible asset for protecting multiple aspects of a product, including the production of ingredients, the creation of recipes, the manufacturing process of a product and the appearance of the product itself, thereby providing an umbrella of rights to help maintain a competitive edge. ●

Dr Joanna Jones is a patent and trade marks attorney and Associate with Davies Collison Cave where she provides advice to local and overseas clients in relation to protecting their intellectual property.

Case study: Eagle Boys Pizza

The Australian-owned and -operated Eagle Boys Pizza understands the value that intellectual property rights can provide in the food industry.

Eagle Boys has registered multiple trade marks – words, logos and slogans – and is also attempting to register a trade mark for the pink glow produced by the lighting on their shop fronts.

Eagle Boys also looks to other intellectual property rights to boost their competitive edge. Its two-tiered pizza box is currently the subject of both patent and design registration applications in Australia and overseas.



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RICE BRAN OIL AS A FUNCTIONAL INGREDIENT

Researchers have recently evaluated the potential a semisolid fraction of rice bran oil as a functional ingredient – both as an antioxidant source in frying oils, and as a replacement for fat in baked goods. Here we summarise their findings.

Consumer interest in the potential health benefits of foods and food ingredients is driving the market potential for new functional ingredients. In the area of lipids, rice bran oil has attracted interest for its high concentrations of health promoting compounds, including tocopherols, tocotrienols, phytosterols and γ -oryzanol.

Utilising a solvent fractionation procedure, researchers from the United States Department of Agriculture (USDA) has recently developed a method for fractionating crude rice bran oil to obtain a semisolid fraction and various additional compounds such as phytosterols, γ -oryzanol, and rice bran wax.¹ The addition of the rice bran wax provides structuring of the fat, which leads to a fraction that is semisolid at room temperature, in contrast to rice bran oil, which is a liquid at room temperature.

The researchers then undertook a trial to evaluate the suitability of the product as a functional ingredient – both as an antioxidant source in frying oils, and as a replacement for fat in baked goods. The findings were published in *European Journal of Lipid Science and Technology* in April 2014.²

Extending the life of cooking oil

In order to evaluate the potential for the rice bran oil semisolid fraction (RBOF) to act as an antioxidant source in frying oils, the researchers added



RBOF to deoderised soybean oil at concentrations ranging from 0.25 to two per cent.

The oils (total weight 900g) were then heated to 180°C and maintained at that temperature while corn tortilla chips were fried for two minutes and then ground for testing. Each concentration of rice bran oil was also monitored for lipid oxidation via total polar compounds (TPC) and polymer analysis.

The research found that the RBOF

can act as an antioxidant in soybean oil, extending the shelf life and fry life of the oil.

The data suggest that the RBOF imparts modest antioxidant activity when mixed with soybean oil, an effect that was dose-dependent, with the two per cent concentration having the highest antioxidative stability.

As we have noted, rice bran oil, and therefore RBOF, contains a mixture of many antioxidant compounds, including tocopherols, tocotrienols, phytosterols,

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and phytosterol esters. While the research did not identify the specific mechanism of antioxidant activity, the researchers did note that each compound has been shown to have antioxidant effects individually and that there is also evidence that some can work in synergy with one another in certain combinations. Therefore, it would not be surprising if several compounds were imparting antioxidant activity, either alone or synergistically.

Lipid oxidation in a food can have a large impact on its sensory properties, which means antioxidant activity in oils and other lipid ingredients is an important consideration for new product formulations.

The sensory results suggest that at a threshold between 0.5 and one per cent by weight in the frying oil, participants were capable of distinguishing between a frying oil incorporating a rice bran oil fraction and one without.

However, at 0.25 per cent spread, they were unable to distinguish between the samples. Because RBOF provides functional benefit at the 0.25 per cent level, the researchers concluded that it is still possible to incorporate this ingredient at concentrations that offer protection against lipid oxidation.

The research showed that RBOF inhibits lipid oxidation. However, the protective effect was not as strongly observed at frying temperatures. The researchers concluded that more work is required to identify the specific conditions and mechanisms under which RBOF inhibits lipid oxidation.

Baked goods

RBOF can also be incorporated into food formulations as the semisolid texture of this fraction makes it ideal for use as a spread or shortening substitute.

Lipid ingredients play an essential

“Lipid oxidation in a food can have a large impact on its sensory properties which means antioxidant activity in oils and other lipid ingredients is an important consideration for new product formulations”

functional role in baked goods – as a moisture barrier, aiding in aeration, contributing to the desired structure, for mouth feel and palatability, and for shelf life. Hydrogenated or partially hydrogenated oils have often been used in commercially prepared baked goods. One of the benefits of RBOF is that it is both trans-fat free and



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allergen free, which in combination with its antioxidant properties make it favourable for development as a functional ingredient in baked goods.

Two food formulations were tested, bread and granola, with RBOF used as a substitute for a portion of the butter or margarine. For both food formulations more than 85 per cent of panelists rated the samples as acceptable. This was true whether or not the panelists could discriminate as to whether the RBOF was in the food. However, the researchers do note that the acceptability ratings were highest in the formulations incorporating the lowest proportions of butter replacement.

The high acceptability ratings indicate that RBOF can be incorporated as functional ingredients into foods while still maintaining high product acceptability among consumers.

While this is the first known report of a rice bran oil fraction in baked goods, the researchers note that both rice bran oil alone and spreads derived from rice bran oil have been shown to have excellent functionality as ingredients in the diet, improving lipid profiles and lowering cholesterol.

Therefore, it would not be surprising if foods developed from RBOF shared this functionality.

In terms of levels required, researchers cite Eady *et al.*³, which observed a positive impact on serum cholesterol with just 20g per day of a rice bran oil spread and extrapolate that a similar health effect would be expected with RBOF at similar consumption levels.

Conclusion

The research evaluated a rice bran oil-derived spread for its suitability as a functional ingredient in a frying oil and in two types of baked goods, bread, and granola. It established a sensory threshold for the ingredient and the researchers hypothesise that the ingredient offers the potential to impart health benefits at levels of consumption that are a reasonable part of the human diet. However, they do note that the research has not established the levels at which these beneficial effects may be seen.

RBOF was shown to impart oxidative stability to the soybean oil, and was successfully incorporated

into baked goods with consistently high acceptability ratings for the two baked goods tested. The product's high stability and positive sensory reception suggest that it might be suitable for further development into a functional food that is allergen-free, trans-fat free, and high in antioxidants.

This article is a summary of key findings of the paper by Erica L. Bakota, Jill K. Winkler-Moser and Sean X. Liu. United States Department of Agriculture, Agricultural Research Service, National Center for Agricultural Utilization Research, Functional Foods Research, Peoria, IL, USA. ●

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AUSTRALIAN MADE

'Australian made' is not enough to win over customers these days. It's time to look at innovation and branding strategies that will give your product a competitive advantage.

Words by Michael Carp

While research¹ reveals Australians have become more conscientious consumers of locally made food products, 'Australian-made' food brands need to understand their customers, know the value of branding, be innovative in their product development, and deliver on promises more than ever to remain competitive and grow market share. Unfortunately, many brands do not.

Consumers may be more aware that 'Australian made' gives them the freshest shelf ingredients, supports local jobs, and helps the economy. While customers are being more committed to buying Australian made. However, local food brands risk becoming less active in their product development and marketing. Overall, being 'Australian made' is only one factor among many that influences a customer's choice to purchase, as well as a buyer's decision to stock the product on shelves.

Local businesses need to maximise the advantage of easier access for buyers from being Australian made. For instance, Kez's Kitchen recently received confirmation by a major supermarket for five new lines and will have products on their shelves in a couple of weeks. If we were importing, we'd lose this lead time in the shipping alone. When it comes to product development and branding, here are six common mistakes Australian-made companies make:

1 They don't offer anything different. Consumers look out for new products that will excite and engage them. If 'Australian-made' brands offer products that emulate many others produced locally, there's little motivation for consumers to switch

brands. They will go with a lower cost item or the one they've always been buying. Food businesses must remain innovative. An example at Kez's Kitchen is our development of the Taking Cafe Home range, which unlike other snack products on the market, brings the cafe experience to your own home.

2 They focus is on price, not quality. Consumers don't always go for the lowest price shelf item, and the recent research – showing that more Australians are buying locally made regardless of price – is proof. Businesses need to be less concerned about reducing shelf prices and instead focus on producing a product of high quality, with a unique point of difference. A quality product is one that incorporates the best ingredients, is high in taste and texture and sometimes even offers a health benefit.

3 They don't work on their brand. If consumers and buyers know and trust a brand, they're more likely to buy. But these days, strong brands go further: they tell a story. Brands with a story can better engage customers, and create brand loyalty. Many businesses have a great story but don't tell it. Ours is the growth of a biscuit business that my sister Kez began in my mum's kitchen 23 years ago – and we take just as much pride in our products today. If food businesses don't develop their brand image – whether they have a story or not – they'll have a tough time reaching consumers, as major supermarkets will be less likely to stock their products. Strong brands can set a higher price and remain confident that buyers and consumers will purchase.

4 They don't deliver on promises. If your brand and packaging makes bold statements about the products inside, you need to follow through. At Kez's Kitchen, our key brand message is that we're all about the taste, and we deliver this by producing high-flavour foods that we're passionate about and consumers know and love. As this is a promise to consumers, we never make sacrifices on ingredients.

5 They don't invest in packaging. While delivering on promises helps ensure repeat purchases, it's the packaging that initially draws consumers in. Packaging is the most visible part of a food business, and businesses need to invest in research, development and design of the packaging. The packaging is also the most important platform for telling your brand story.

6 They don't adapt to change. Perhaps the easiest mistake is simply standing still. Not only are consumer needs and tastes changing – competitors are getting better at what they're offering. If you don't adapt your brand and product, you'll be left behind. In a country as competitive as Australia, we need to get out of our comfort zones to continually improve. 

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Michael Carp is the managing director of Kez's Kitchen, a family-owned and operated business that bakes high quality gourmet biscuits.



Georgie Aley

Georgie Aley was appointed managing director of the Grains & Legumes Nutrition Council in November 2012. Aley has held senior management roles within the Australian grains industry with a background in policy and corporate affairs. She holds a Bachelor of Business Management, is a Masters of Business Administration (MBA) candidate and a director of Pulse Australia Limited, Future Farmers Network and Workforce Consulting. In recognition of Aley's industry involvement and leadership, she was announced the 2013 inaugural recipient of the Rabobank Emerging Leader Award.

Georgie Aley will be a keynote speaker at the 47th Annual AIFST Convention discussing how health and nutrition is driving innovation in the Australian grains industry.

Q What are some of the challenges and opportunities facing the grains and legumes industry at the moment?

A The key challenge is to help consumers understand the benefits of grains and legumes in the diet. Research tells us that 92 per cent of the population regularly consume grains, however, the increasing anti-grain and anti-carb messages are misleading consumers to believe that they can cut grains out of their diet as they don't provide any nutritional value. The science tells that this is not the case and these mixed messages are an area of concern for both industry and consumers.

Q How is an increasingly health-conscious consumer driving innovation in the food industry in general?

A Consumers are seeking more and more information and transparency as well as confirmation and assurance around nutritional claims made on pack. Many companies are now using these trends to deliver products that provide a point of difference against their competitors.

Q What are the priority health and nutrition issues that are behind innovation, specifically in the grains and legume industry?

A The focus on protein is re-emerging as a trend with consumers. We also continue to see the 'free from' movement – focused on dairy, nuts, gluten and wheat. However many consumers are confusing gluten-free and 'free from' foods as healthy via a halo effect when in fact there is minimal value in these foods for individuals who

aren't medically diagnosed as coeliac or intolerant. Many innovations are combining a grain-based food with legumes or combinations of several grains as consumers seek a complete nutritional package.

Q There has been a wide adoption of the Code of Practice for whole grain ingredient content claims. What is the next significant step in the process?

A Since the Code of Practice for Whole Grain Ingredient Content Claims launch at the 2013 AIFST Convention, the past 12 months have been focused on meeting with food manufacturers and industry to educate them on the Code. To date we have 12 registered users who have signed up to the Code. The next significant step is consumer communication. As the claims, along with the GLNC 48g whole grain Daily Target Intake, are now appearing on packs, we are focused on engaging consumers on what the whole grain ingredient content claims mean for them.

Q Ancient and pseudo-grains like quinoa and farro have become all the rage. What will be the next big (new or old) thing in grains?

A While ancient and pseudo-grains have become a talking point over the past 12 months, our research shows only a very small proportion of Australians (0.6 per cent) are consuming either ancient or pseudo-grains. I personally don't like to predict the future – that's always a challenge. However, I would say the combined grains and legumes foods still have room to grow! 🍌



INNOVATING FOR OUR FOOD FUTURE: FROM MINING TO DINING BOOM

The CSIRO and ATSE Food Industry Seminar addressed the role innovation plays in securing our future in food.

Australia's food industry is at a critical point, facing significant challenges and opportunities for growth. The role of innovation in securing its future was the theme of the CSIRO and Australian Academy of Technological Sciences and Engineering (ATSE) Food Industry Seminar held in Sydney on 1 May, supported by AIFST.

The seminar brought together leaders from Australia's food industry, government, research organisations and universities to share experiences and insights for strengthening the industry.

Opportunities and challenges

Speaking from his experience as an agricultural producer and company director, Dr John Keniry opened the event by setting the scene for the future. He acknowledged the increase in the global population, particularly in Asia, as a real opportunity, but highlighted that Australia is a relatively small producer on the global scale, and that our population was also growing, so in the future we will be consuming some of what we currently export.

Keniry said that as a relatively small supplier, we need to identify our niche and target those wealthy consumers willing to pay for sustainability, nutrition, traceability and animal welfare certification. "We can't be a food bowl for everybody," he said.

Terry O'Brien, Simplot Australia's chief executive and chair of the Australian Food and Grocery Council (AFGC), identified structural changes in the market, the reduction of Australia's global competitiveness and the changing consumer as major challenges. He identified government regulation of the industry as a significant challenge, and warned against the risk of overregulation.

Gary Dawson, AFGC's chief executive, said that Australia's global competitiveness has reduced, and with it, market share. In the view of the AFGC, he said there is need for urgent action on trade and market access, support for investment, improved rail and other infrastructure, regulation and labour costs, and innovation.

The changing Australian consumer

Several speakers raised the importance of taking into account consumer insights. Professor Mary O'Kane, NSW



Dr John Keniry, AM FTSE and Mel Malloch, AIFST.



Gary Dawson, Australian Food and Grocery Council, Dr John Best, Thales Australia, Dr David Cook, ATSE NSW Division

Government chief scientist and engineer said that Australians are now, more than ever, interested in food and living a long, healthy and successful life.

This revival in fresh food and cooking is a change that was first detected several years ago, said David Thomason, Seafood CRC and Fisheries R&D Corporation director. What was a long-term decline in meal preparation times has since stalled and then began to rise. This was coupled with a renewed focus on taking the time to make sure that children were fed well, and a perception that the industry had failed the consumer in this regard.

Thomason said that the consumer priorities of enjoyment, value for money, convenience and nutrition that have dominated over the past few decades now also include integrity.

“We are entering the ‘age of integrity’, where ethics and values need to be real, and must influence what we do and how we communicate,” said Thomason.

Professor Mike Gidley from the University of Queensland (UQ) put this in terms of a ‘fork to farm’ process, where the industry needs to start with the consumer’s needs and then work backwards to the agricultural product that fulfils that need.

Asian opportunity

Chris Downs, deputy chief and portfolio director for CSIRO Animal, Food and Health Sciences, said that while food is Australia’s largest manufacturing sector, when it comes to exports, commodities dominate. Australia’s exports of elaborately processed foods remain low, he said, and this is an opportunity, particularly for Asia.

Downs said that Asia presents a real opportunity due to increasing incomes so consumers are willing to pay a premium for imported products that are perceived as safer and healthier than local options, as well as convenience foods and well-packaged and branded foods for gifts.

Examples of such value-added, premium-priced items are CSIRO’s ready-to-eat concept meals. The concept meals use high-pressure processing to preserve sensory quality and extend shelf life, and are one example of how processing innovation could help Australia to capitalise on this opportunity.



Professor Mary O’Kane, NSW chief scientist and engineer.



Dr Jim Peacock and Professor Maurice Moloney, CSIRO.

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CSIRO concept ready-to-eat meals produced using high-pressure processing.

Brand Australia

The role of Australia's global image in supporting our food industry was discussed by several speakers at the seminar.

"We need to be out there protecting and reinforcing our clean and green image," said UQ's Mike Gidley, as he cautioned against this becoming simply a marketing term. He said that in order to support the image, we need continual development and improvement of systems for accreditation and technical validation, and we need to proactively look for and combat potential threats.

Gidley said that Australia is a food production country of origin that many consumers are looking for. David Thomason also identified the potential for 'Brand Australia'. We must convince Australian producers to work together to develop this, he said, but it must be about more than country of origin – it needs to be an ongoing market platform.

Whole of value chain innovation

CSIRO's Jim Peacock spoke about the two sectors of the food industry – the production and the processing sector – but said that unfortunately it isn't often the two meet and we need to increase this collaboration.

Innovations in agriculture can provide an increase in value that carries to the finished product, without the need for new processing equipment, which is often a cost of innovation. Peacock said that the CSIRO-developed BARLEYmax grain and canola that produces long-chain omega-3 oils, currently under development, are two examples of this. He said that Australia can find a high-value, specialised place in the international market, provided that all sectors of the industry work together.

Andre Teixeira, Goodman Fielder's chief R&D and quality officer, said that any plans for innovation must start by listening to the consumer, the market and the product, and that function must follow form, with R&D playing a role in all stages of a product, from assessment to launch.

"Food R&D can resolve the paradox that the same consumer who wants the latest high technology also wants food to taste like Grandma made it," said Teixeira.

Role of government and universities

Barry McGookin, Food Innovation Australia Limited's (FIAL) general manager of innovation, capabilities and skills, emphasised the role of government in supporting innovation in the industry.

He spoke about FIAL initiatives that aim to bring the agricultural, food and beverage sectors together to collaborate. These include working with AIFST to form connections between research and industry, and a new SME solutions centre to identify opportunities and provide technical support.

The role of training was addressed by Associate Professor Jayashree Arcot from the Australian Research Council Training Centre for Advanced Technologies in Food Manufacture at the University of New South Wales. Arcot said that the new centre is designed as a training centre to increase technical knowledge and add value to the industry. It aims to take Australian R&D to the next level by giving trainees management and other industry-relevant skills along with technical skills.

High-value, differentiated products for the future

The role of high-value, premium products as opportunity for the future was identified by several speakers throughout the seminar.

UQ's Mike Gidley referred to this as moving from commodities to specialties, and from a cost per kilogram to a cost per eating occasion model. He said that one way to achieve this was through increasing the nutritional attributes of foods, giving the examples of sweet corn that could provide protection against macular degeneration through increased levels of zeaxanthin, and plums with high levels of antioxidants.

The importance of consumer health benefits delivered through high-value products was discussed by Maurice Moloney, CSIRO group executive for Food, Health and Life Science Industries, who said that Australia was in a position to value-add to all aspects of the value chain.

If there is functionality that is felt by the consumer then they will pay a premium for the product, he said. Moloney asked the audience to consider a future where the ageing consumer has greater income, and prioritises quality of life, and proposed that nutritional intervention through premium products is something that Australia can provide, as long as the research and industry continue to work together. ●

Innovating for our food future: From mining boom to dining boom was held in Sydney on 1 May 2014, presented by ATSE and CSIRO, and supported by AIFST. Event summary prepared by CSIRO. For further innovation opportunities see CSIRO's stand at Foodpro 2014, near the entry to the AIFST Convention.

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NUTRITION WATCH

What's new in nutrition? The following research has been recently published.

Words by *Dr Ramon Hall*



Diet links to lower CVD risk and mortality in men

Researchers from the University College London have investigated the prospective association between different dietary scores and risk of cardiovascular disease (CVD) and all-cause mortality in older British men (Atkins *et al.*, 2014).

The study examined 3328 men aged 60-79 years at baseline from the British Regional Heart Study. Participants were free of CVD at baseline and were followed for 11.3 years for CVD and mortality. Food frequency questionnaires collected at baseline were used to examine two different dietary quality scores, namely, the Healthy Diet Indicator (HDI), which is based on WHO dietary guidelines (using intakes of SFAs, PUFAs, protein, carbohydrates, sugar, fibre, cholesterol and fruits and vegetables) and also the

Elderly Dietary Index (EDI), which is based on Mediterranean-based dietary intakes (using intakes of meat, fish and seafood, legumes, fruit, vegetables, cereals, bread, olive oil and dairy). Higher scores for each dietary quality score indicated greater compliance with the dietary recommendations. Follow-ups over the 11.3-year period revealed a total of 933 deaths, 327 CVD deaths, 582 CVD events and 307 CHD events. Quartiles of HDI and EDI were used to examine associations between risk of CVD and mortality.

This study revealed that men in the highest EDI quartile compared to the lowest EDI had significantly lower risks of all-cause mortality, CVD mortality and CHD events. There was no significant association between EDI and CVD events. The HDI diet quality score did not reveal any significant association with any of the outcome measures.

The authors propose that diet quality scores based on specific foods or groups of foods, such as the EDI, may be better predictors of CHD events, CVD mortality and all-cause mortality in an older population than diet quality scores based on recommended nutrient intakes, such as the HDI. They said that these results concur with a substantial body of evidence showing strong associations between a Mediterranean-style diet and lower risk of CVD and all-cause mortality in both middle-aged and elderly populations.

The authors conclude that “EDI appears to be more useful than HDI for assessing diet quality in relation to CVD and mortality risk in older men. Encouraging older adults to adhere to the guidelines inherent in the EDI criteria may have public health benefits”.

The study also indicates that using whole foods measures of diet quality may have some advantages to using traditional nutrient approaches in assessing health risk, as it considers the whole food matrix and not just selected nutrient components that are well understood from a dietary perspective.

Atkins *et al.*, (2014) “High Diet Quality Is Associated with a Lower Risk of Cardiovascular Disease and All-Cause Mortality in Older Men”. *Journal of Nutrition*, 144: 673-680, (doi:10.3945/jn.113.186486).

Dairy helps lower blood pressure

Researchers from the University of Texas in Austin, USA, have investigated whether the solitary addition of non-fat dairy products to a normal diet was capable of lowering blood pressure in middle-aged and

older adults with elevated blood pressure (Machin *et al.*, 2014).

The randomised controlled cross-over intervention study involved 49 adult males and females (average age: 53 years) with elevated blood pressure (systolic blood pressure 135 ± 1 mm Hg; diastolic blood pressure: 80 ± 1 mm Hg). All participants underwent a high dairy dietary period (involving consuming +4 servings of non-fat dairy products (milk, yoghurt, cheese) per day) and an isocaloric no-dairy dietary period (involving consuming +4 servings of fruit products per day and any dairy products were excluded from the diet). Each dietary condition was undertaken for four weeks in a randomised order with a two-week washout period in between.

The study showed that the high dairy intervention significantly reduced systolic blood pressure from 135 ± 1 mm Hg to 127 ± 1 mm Hg and pulse pressure from 54 ± 1 mm Hg to 48 ± 1 mm Hg and these hypotensive effects were observed within three weeks of starting the intervention. The reduction in causal seated systolic blood pressure in the high dairy treatment was accompanied by

a similar reduction in ambulatory (24 hour) systolic blood pressure. Pulse pressure was found to significantly increase after the removal of dairy products from 54 ± 1 mm Hg to 56 ± 1 mm Hg. There was no observed effect on diastolic blood pressure after either of the dietary interventions.

Lifestyle changes such as diet and exercise are often the first line approaches to treating elevated blood pressure. The authors suggest that “the solitary manipulation of conventional dairy products in the normal routine diet would modulate blood pressure in middle-aged and older adults with pre-hypertension or hypertension. The authors acknowledge that individual components contained in dairy can potentially play a role in reducing blood pressure (including dairy protein, magnesium, calcium and milk peptides), but they were unable to determine from this experiment which of these components may have attributed to the hypotensive effect.

This study concurs with the evidence statements within the Australian Dietary Guidelines that indicates three serves of milk, cheese or yoghurt products a day is associated* with

reduced risk of hypertension. As suggested by the researchers, future studies are warranted to determine the effects of full fat dairy products added to the normal diet on blood pressure, as the evidence has evolved suggesting that regular dairy food intake has no or an inverse relationship with metabolic and CVD risks.

** Probable association for low fat dairy products; Suggestive association for any dairy product.*

Machin *et al.*, (2014) “Hypotensive effects of solitary addition of conventional non-fat dairy products to the routine diet: a randomized controlled trial”. *American Journal of Clinical Nutrition*, Published online ahead of print (doi: 10.3945/ajcn.114.085761).

Higher GI and GL linked to type 2 diabetes

Researchers from USA’s Harvard School of Public Health in Boston have undertaken a prospective analysis of three large US cohort studies and conducted an updated meta-analysis to examine the association of dietary glycemic index (GI), glycemic load (GL) and type 2 diabetes risk (Bhupathiraju *et al.*, 2014).

The study involved prospectively following individuals from three large Harvard cohort studies including: 74,248 women from the Nurses’ Health

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Study (1984-2008), 90,411 women from the Nurses' Health Study II (1991-2009) and 40,498 men from the Health Professionals Follow-Up Study (1986-2008) who were free from diabetes at baseline. As part of the study, dietary data were updated every four years using a validated questionnaire and the study also documented cases of incident diabetes. Over the three cohorts during 3,800,618 person-years of follow-up, a total of 15,027 cases of incident diabetes have been documented. The researchers also undertook a meta-analysis of 20 GI and 30 GL cohort studies including the three cohorts updated in this study.

The results reveal that those individuals in the highest quintile of energy adjusted GI had a 33 per cent higher risk of type 2 diabetes than those in the lowest quintile, while participants in the highest quintile of GL had a 10 per cent higher risk of type 2 diabetes. Also, participants who consumed a combination diet that was high in GI or GL and low in cereal fibre had an approximately 50 per cent higher risk of type 2 diabetes. The updated meta-analysis comparing highest versus lowest categories for GI and GL revealed an increase in type 2 diabetes risk of 19 per cent for increased GI and 13 per cent for increased GL.

The authors conclude that "Results from our study confirm that consuming a high-GI/GL diet is associated with a higher risk of type 2 diabetes. Participants who consume diets that are low in cereal fibre but with a high GI/GL have an elevated risk of type 2 diabetes". The authors also suggest that given that the lifetime risk of developing type 2 diabetes in the US is 32.8 per cent for men and 38.5 per cent, even small reductions in risk as observed in this study can translate into large differences in absolute risk and have important public health implications.

The authors suggest that the next step to provide final confirmation of the role of GI and GL in relation to type 2 diabetes is to conduct a large randomised controlled trial to evaluate the role of low GI and GL diets in preventing type 2 diabetes.

Although fairly well accepted, this research reinforces the link between low GI/GL and reduced risk of type 2 diabetes. Low GI/GL approaches will become more prominent as a preventative measure through government initiatives and tailored manufactured food options, as rates of type 2 diabetes continue to soar and are predicted to have a significant impact on government health costs.

Bhupathiraju *et al.*, (2014) "Glycemic index, glycemic load, and risk of type 2 diabetes: results from 3 large US cohorts and an updated meta-analysis". *American Journal of Clinical Nutrition*, Published online ahead of print (doi: 10.3945/ajcn.113.079533).

Package size helps reduce intake

Researchers from the University of Tennessee, Knoxville, USA, have undertaken a study to determine the independent and combined effects of body weight and restraint status on the relationship between package size and food intake in a natural environment (Haire *et al.*, 2014).

oz/25.5g) or STPs (10 oz/284g) and they were instructed to eat them *ad libitum* over a four-day period, with eight participants per condition. Total amount eaten was determined by the difference between pre and post-consumption weight of packages.

The results showed that the overweight/obese participants in the SSP treatment group ate significantly fewer grams of pretzels than overweight/obese participants in the STP condition (107 ± 101.9 g compare to 204.4 ± 144.9 g). There was no significant effect of restraint found on food intake patterns.

The authors conclude that "restraint status did not moderate the relationship between package size and food intake, but for some overweight/obese individuals, SSPs were associated with less consumption compared to STPs". The authors added "because overweight/obese individuals may be responsive to package size, consuming food from SSPs rather than STPs may

“ These results may have importance for manufacturers of snacking foods and reflects measures already taken to help consumers manage food intake ”

They were specifically interested to understand if single-serve food packages (SSPs) would produce less consumption compared to standard food packages (STPs) in both overweight/obese and restrained individuals and whether this effect would be more pronounced in individuals classified as both overweight/obese and restrained. The researchers undertook a study involving 64 participants using a 2x2x2 between subject design (unrestrained/restrained x normal weight/overweight x single serve packages/standard food packages). Participants were aged 23.7 ± 3.3 years and 46.9 per cent were female and they were randomly assigned to receive 20oz (~567g) pretzels packaged in SSPs (0.9

assist with reducing intake due to the removal of the external cue to eat."

These results may have importance for manufacturers of snacking foods and reflects measures already taken to help consumers manage food intake. Further work, including combining this approach with foods that potentially enhance satiety, would be interesting.

Haire *et al.* (2014) "Weight status moderates the relationship between package size and food intake". *Journal of the Academy of Nutrition and Dietetics*, Published online ahead of print (doi: 10.1016/j.jand.2013.12.022).

Dr Ramon Hall is manager of the Dairy Health and Nutrition Consortium at Dairy Innovation Australia and is an Honorary Research Fellow at the School of Exercise & -Nutrition Sciences, Deakin University.



FUNCTIONAL FOODS ROUNDUP

China presents good growth opportunities for Australian UHT milk manufacturers while the debate about added sugar in foods continues.

Words by *Ranjan Sharma*

UHT milk opportunities in China

Australian dairy industry investment in products targeted to China and South-east Asia has seen a significant boost in the past couple of years. Apart from the growing demand for infant formula and milk powders, there are opportunities for export of long-life/UHT milk. Currently, over 60 per cent of the total milk consumed in China is UHT milk.

According to Datamonitor, the current market for UHT milk in the Asia Pacific (APAC) region is worth US\$11 billion, dominated by China with over 60 per cent market share. Datamonitor predicts that the APAC market for UHT milk will grow over 50 per cent to nearly US\$17 billion by 2018 (see Figure 1) with China's share rising to 70 per cent or nearly US\$12 billion.

UHT milk imports

According to United States Dairy Export Council (USDEC), Chinese imports of UHT milk have grown from a meagre five million litres in 2008 to over 150 million litres in 2013 (see Figure 2). Much of these imports have come from countries like New Zealand, Australia, Ireland and Germany.

Demand scenarios conducted by USDEC suggest China's appetite for imported UHT milk could more than quadruple from 150 million litres in 2013 to at least 600 million litres by 2020. According to Ernst & Young, China's middle class will surge to one billion in 20 years, up from 150 million at present with most of this increase in the urban population, which compared with the rural population is more influenced by

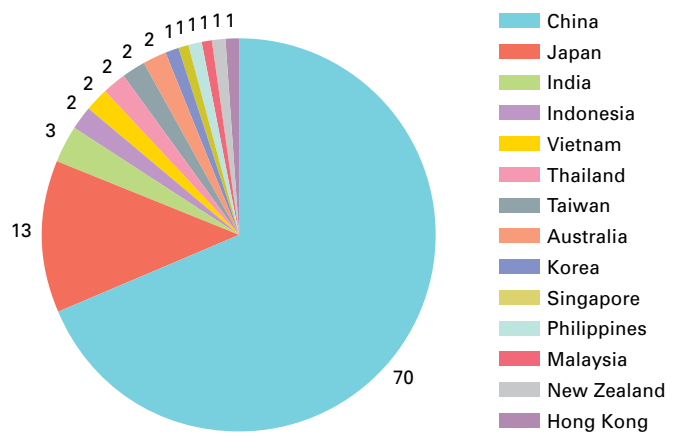


Figure 1: UHT milk: value 2018 – US\$17 billion by percentage. Source: Datamonitor

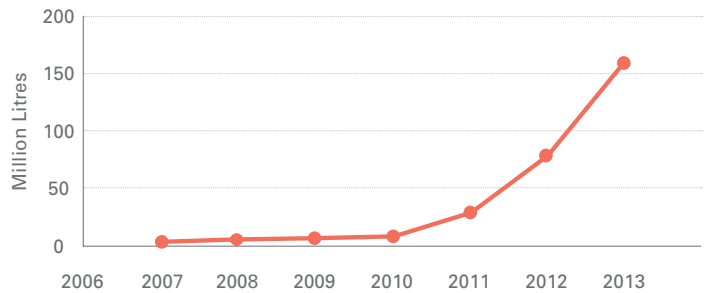


Figure 2: China – UHT milk imports. Source: USDEC

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western cultures owing to their better income levels. Partly due to past food safety scares, Chinese consumers have shown they are willing to pay two to three times more for imported UHT milk than for the local milk.

New plant investments

Various Australian dairy companies have invested in UHT plants. This year Pactum Dairy Group, a joint venture between Freedom Foods and Australian Consolidated Milk, opened an AU\$40M UHT plant at Shepparton for brand and contract processing, mainly for China. It is also planning to package UHT milk in 20,000L bladders for repackaging in China, Hong Kong and Singapore. The company claims that due to its deal with Bright Dairy of China, it is well ahead of meeting its processing capacity of 100 million litres, which could potentially be increased to 300 million. Australia's biggest dairy company, Murray Goulburn, market leader in UHT milk, has invested in its Leongatha and Edith Creek plants. Other investments include Parmalat Australia, which added a UHT packaging line at Rowville and purchased WA's UHT brand Harvey Fresh.

In New Zealand, Fonterra recently opened a NZ\$110 million UHT plant at Waitoa, which will process 90 million litres of milk. Fonterra wants to go one step ahead and install its own UHT processing plant in China in 2014/15.

Varied milk needs

Although UHT milk is over 60 per cent of the market, there is strong consumer desire for fresh milk or milk that tastes like fresh milk, with demand for low-fat milk significantly higher than that for full fat. There is also increasing demand for flavoured milk and milks with particulate materials such as cereals, beans or fruit pulp.

It is important that investments are made into packaging lines that can fill particulate material in UHT milk. Most suppliers of aseptic packaging machines such as TetraPak, SIG Combibloc and Elopak have options for delivery of particulates. Another thing to note is that although hypermarket and supermarkets account for close to 50 per cent of the market spend, gift channel is still an incredibly important channel for Chinese consumers. Although it seems strange to Australians, 25 per cent of UHT spend is on gift packs which are given to friends and family along with chocolate and confectionery, especially on Chinese New Year when its market share reaches up to 40 per cent.

Pressure mounts to reduce added sugar

Around the world, organisations and consumer groups are putting pressure on food and beverage companies to reduce added sugar in their products due to the increased problems of lifestyle diseases such as obesity, diabetes, heart disease and cancer.

According to the Food and Agriculture Organization of the United Nations (FAO), Australia's sugar consumption is thought to be the highest in the world, with the average Australian consuming 40kg of sugar per year (33kg in the USA, 25kg in France, 20kg in Japan).

Is a sugar tax the answer?

A number of Australian health organisations and consumer advocate groups would like government to impose a sugar tax on all sweetened beverages including soft drinks, flavoured milk and sports drinks. This is strongly objected by food and beverage companies who maintain that there is no link between sugar and lifestyle diseases. Recently a couple of studies were published which supported the food industry arguments as the compiled data over 20 years suggested that sugar intake in Australia in fact declined despite the increase in obesity and associated diseases.

Food labelling

Labelling added sugars on nutrition information panels is one way of letting consumers know the amount of sugar they are receiving so that they can make an informed decision about the food. Although no food labelling changes are yet planned in Australia, US FDA has proposed new nutritional panel labels to reflect the latest scientific information, including the link between diet and chronic diseases such as obesity and heart disease. The new labelling will include the amount of 'added sugars' in addition to the sugar naturally contributed by ingredients.

Reducing sugar in food has a host of complications for the food industry, including taste, formulation, texture, regulatory, labelling and other issues. An article in *New Scientist* argues that the best way to deal with it is by working with the physicians and the food industry where the physician advocates reduction while the companies slowly reformulate their product.

UK salt strategy

Such a strategy has worked for salt reduction in the UK. According to *New Scientist*, around 20 years ago a small group of cardiovascular specialists in the UK decided to do something about the large amounts of salt being added to processed food. It seems the campaigners persuaded manufacturers to gradually reduce the amount of salt in processed foods. The aim was to wean people off salt and it worked; people in the UK now prefer foods with less salt. That success is being replicated worldwide. There is no reason why a similar approach could not be implemented to sugar in Australia. 🍬

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Ranjan Sharma compiles the market intelligence newsletter, Functional Foods Weekly, (www.functionalfoods.biz).

Protecting your brands, business and back: Governance issues for directors and officers of FMCG businesses

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August 17-22 29th International Horticultural Congress. *Sustaining Lives, Livelihoods and Landscapes* Brisbane Convention & Exhibition Centre. www.ihc2014.org

August 19 International Life Sciences Institute SEAR Australasia Inc and the Omega-3 Centre Inc. *Maternal and infant nutrition – new Australian research and more.* Melbourne, Victoria. www.ilsa.org

August 26-28 Australian HACCP Conference. Doltone House, Sydney. www.australianhaccpconference.com.au

INTERNATIONAL 2014

June 21-24 Institute of Food Technologists (IFT) Annual Meeting & Food Expo. New Orleans Morial Convention Center, New Orleans, USA. www.ift.org

August 5-7 International FoodTec Brasil. International supplier fair for the food industry. ExpoUnimed, Curitiba, Brazil. www.foodtecbrasil.com

August 17-21 IUFOST 17th World Congress of Food Science and Technology & Expo. *Research That Resonates* Montreal, Canada. www.iufost2014.org

September 3-4 Vitafoods Asia. *AsiaWorld Expo*, Hong Kong. www.vitafoodsasia.com

September 7-9 7th International Whey Conference. *Experience the excitement around whey.* Beurs World Trade Centre, Rotterdam, The Netherlands. www.iwc2014.com

October 27-31 IDF World Dairy Summit. Tel Aviv, Israel. www.idfwds2014.com

November 9-11 Sweets & Snacks Middle East. Dubai International Convention and Exhibition Centre, Dubai, U.A.E. www.sweetsmiddleeast.com

November 18-20 Food Matters Live. ExCeL London exhibition and convention centre, London, United Kingdom. www.foodmattersglobal.com

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RIVERINA GOES NUTS

This industry investment will be music to the ears of chocolate lovers whose secret indulgence is a teaspoon of Nutella straight from the jar.

With over 300 chocolate producers in Brussels alone, the capital of Belgium is also considered the chocolate capital of the world. It's a closely contested title with Switzerland, home to Nestlé and Lindt, which holds the record for the most chocolate consumed per person than in any other country.

Now Italian company Ferrero, one of the world's largest chocolate manufacturers with brands such as Ferrero Rocher and Nutella, is helping the little-known town of Narrandera in the south-west of NSW to also make a name for itself in the global chocolate business.

Agri Australis, an Australian subsidiary of the Ferrero Group, is investing \$70 million to develop a large-scale hazelnut project near Narrandera in the New South Wales Riverina with one million hazelnut trees planted on 2,000 hectares of land.

The farm's first commercial hazelnut crop is expected in the next four years, with full production by 2022. Managing director of Agri Australis, Alessandro Boccardo, said the nuts would initially be exported to Europe.

"They will be sent overseas for processing, but certainly the long-term goal is just to have the processing done in Australia, to have the complete traceability of the food chain here and use what is in excess overseas," he said.


Minister for Primary Industries Katrina Hodgkinson said the project was being set up as a demonstration farm to illustrate the potential sustainability and profitability of the hazelnut business in Australia.

"Having one of the world's biggest confectionary companies leading by example could prompt the state's farmers to consider hazelnuts as a new cropping option," Hodgkinson said.

"Australia imports more than 2,000 tonnes of hazelnuts annually at an estimated cost of \$12 million, while the local industry currently supplies less than 50 tonnes. An increase in local production of hazelnuts means manufacturers can source nuts locally reducing freight costs and ensuring they have fresh high quality nuts."

Member for Murrumbidgee Adrian Piccoli said the project had the potential to bring another valuable income source to the state's regional economy. "The investment could provide up to 50 permanent jobs and 50 seasonal jobs and will deliver a welcome economic boost for the Riverina," he said.

The hazelnut project was announced at the same time as the launch of the Ferrero Group's Corporate Social Responsibility Report that states that the company is on track to achieve its goal of 100 per cent sustainable certified cocoa by 2020 and 100 per cent certified sustainable segregated palm oil by the end of 2014.

Ferrero has been commended by the state government for establishing an innovative tri-generation (combined heat, power and cooling) plant, which powers more than half of the company's factory at Lithgow where Nutella is manufactured for local consumption and export markets. 



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