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AUGUST/SEPTEMBER 2015

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## Ballantyne

DAIRY INNOVATION

*Also Inside*

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HEALTH CLAIMS – THE REGULATORY SAGA CONTINUES  
DAIRY INNOVATION HUB FUELS GROWTH AND PRODUCTIVITY

# ON THE COVER

## Capture the true taste of Ballantyne's cultured dairy powders

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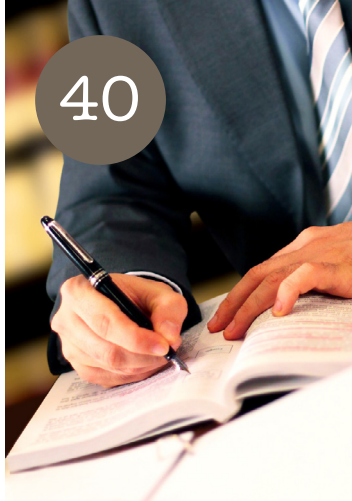
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# food australia

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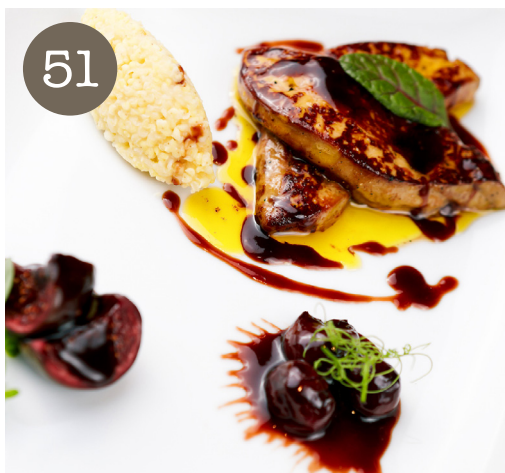
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## FROM THE CHAIR

Welcome to the August/September 2015 issue of *food australia*.

This is always an exciting, albeit busy, time for the Institute as the 2015 Convention is just around the corner. We have a full program of exciting topics sure to spark some interesting discussions over the three days. We are expecting over 600 delegates who will hear from 90 local and international speakers, during what is set to be the biggest food industry event in Asia Pacific this year. Read more about what's in store at the Convention on page 17.

In this issue, we focus on dairy, including an update on the Australian Research Council's Dairy Innovation Hub, 18 months on. We also hear from CSIRO on their latest research for industrial dairy processing on page 42.

We also take a close look at the latest research on the use of chill temperatures to reduce the rate and extent of microbial storage.

To close, our final word this issue looks at latest Australian research to reduce waste for wine grape growers by turning it into profits through the commercialisation of grape marc.

We hope you enjoy *food australia* and I look forward to seeing you at the 48th Annual AIFST Convention and 15th Australian Microbiology Conference in Sydney.

**Dr Anne Astin**

AIFST Chair & President



  
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BY THE NUMBERS

# HOME BRANDS DOMINATE THE CHEESE MARKET



Along with milk, bread and eggs, cheese is a staple that most consumers will include in their shopping trolley on a regular basis. In fact, the latest findings from Roy Morgan Research reveal that 84 per cent of Australian grocery buyers purchase some kind of cheese in an average four weeks.

The findings reveal that consumers usually buy either block, grated /shredded or sliced cheese, with the majority opting for supermarket brands.

General manager – consumer products at Roy Morgan Research, Andrew Price, said that although Australian buyers are not opening up to home-brand products, cheese buyers are the exception to the case.

“Driving the home brand movement, we have grocery buyers from the 35-49 age bracket, who are consistently more likely than those from any other age group to buy supermarket-branded cheeses.

“With Australia’s supermarkets currently jostling for greater market share, home brands are one of the key battlegrounds. Attracting customers with a quality, affordable range of own-brand products is a positive way for supermarkets to prosper in this changing climate.

“Though this is easier said than done, the popularity of home-brand cheese is cause for optimism,” said Mr Price.

Source: Roy Morgan Research, July 2015.

9.4M

Australians purchase block cheese in an average four-week period

25%

of Australians choose supermarket brand cheeses

Australians purchase supermarket brand shredded/ grated cheeses three times more than the second-most popular brand, Bega

3X

84%

of Australians purchase some type of cheese in an average four weeks

30%

of sliced cheese purchased by Australians is supermarket brands, with 1.6 million Aussies buying them in a four-week period

2ND

3RD

Bega comes in second in the sliced cheese segment, with 1.3 million buyers in a four-week period followed by Kraft with 1.1 million



## CHINA IMPORTS SAVE BEEF FOLLOWING INDO-BOYCOTT

Agriculture Minister Barnaby Joyce has signed off on a key condition for a live cattle export deal with China, worth up to \$2 billion per year.

The news follows Indonesia's announcement that they would be cutting live cattle imports from Australia to 50,000, down from 180,000 for the same period in 2014.

Minister Joyce said the Australian and Chinese veterinary authorities were in the process of formalising agreement on animal health certification requirements, which would allow industry to begin preparing the commercial arrangements for trade to commence.

"Over the past five years we have had a significant trade in breeder cattle with China, primarily for dairy heifers. Now I am pleased to announce we are a step closer to the commencement in trade in live slaughter and feed cattle to China," Minister Joyce said.

The first exports are planned to take place in 2016 with about 40,000 to 50,000 head of cattle to initially be exported.

The Australian Livestock Export Industry welcomed the news, saying the signing of the health protocol increases the suit of market opportunities to underpin a million head trade to Asia and the region.

Chief executive officer of the Australian Livestock Export Industry, Alison Penfold, said this was a breakthrough for the industry and significantly improves the market diversification options for Australian exporters and producers.

"Recent market access achievements have contributed significantly to improved farm gate returns for Australian producers while continuing to support over 10,000 jobs across Australia," said Ms Penfold.

"The Australian trade's overseas presence has also helped lift animal welfare standards with new and improved infrastructure and the training of over 8,000 people in proper handling and slaughter practices through the extension work of the MLA/LiveCorp Live Export Program."

Ms Penfold said there was a strong commercial interest from China to help satisfy hungry Chinese consumer demand for red meat off the back of Australia's reputation as a reliable quality breeder and supplier.

Expectations about supplying the market need to be moderated by the health, quarantine and cattle



specification information to producers when they go to market looking for cattle.

Australia will be the first country to export feeder and slaughter cattle to China.

"The Protocol is a testament to the industry and government collaboration and cooperation and recognition that the Australian Government is focused on achieving new market opportunities for the livestock export sector and Australian cattle producers," Ms Penfold said.

# NOT PLENTY OF FISH IN THE SEA

Tasmanian scientists have warned that global marine resources cannot sustain current levels of global consumption.

In a paper published in the journal *Nature Communications*, Professor Reg Watson of the University of Tasmania's Institute for Marine and Antarctic Studies (IMAS) said marine resources are finite and global demand for seafood is unsustainable without intervention.

"Communities will need to decide how to use accessible fish protein – either directly as protein, as a food supplement for farmed seafood species such as salmon, intensive industries like chicken and pork, or even in fertiliser," said Professor Watson.

Many countries already require areas multiple times the size of their own waters to support their population's seafood requirements. Fleets travel widely and seafood is traded globally in unprecedented volumes.

The study from IMAS is the first in the world to consider changes in the efficiency of sourcing seafood to the end of this century and highlights how the human footprint has expanded across the world's oceans.

Food supply systems from the marine environment are currently struggling to meet expanding demand,



with production challenged by increasing storm events associated with climate change, ocean warming and acidification.

"Our examination of the global ocean's ability to meet future demands to 2100 indicates that even with aquaculture supplementing near-static wild catches, growing demand is unlikely to be met without significant changes," said Professor Watson.

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## UNIVERSITY OF SYDNEY'S BREAKFAST OF CHAMPIONS

Leading Australian breakfast manufacturer Sanitarium Health & Wellbeing is the latest member of the University of Sydney's Australian Research Council Food Processing Training Centre (ARC-FPTC).

Sanitarium joins 11 other companies as a member of the University's ARC-FPTC, who are predominantly agricultural and food industry groups ranging from fruit growers to food packaging providers.

Director of the ARC-FPTC, Professor Fariba Dehghani, says the research centre was created to support Australian business and design better methods of food processing and storage.

"The centre is focused on boosting the Australian industry's capacity to compete in a global market, particularly in the production of nutraceuticals for pharmaceuticals, dietary supplements or food ingredients," he said.

"We are looking at ways to develop advanced manufacturing techniques with the ultimate view to reduce costs and increase energy efficiency.

"Our vision at the centre is to educate a new generation of engineers and scientists to foster the capacity of Australian food industries for product improvement," Professor Dehghani said.



Sanitarium joined the ARC on 1 July 2015.

Dr John Ashton, strategic research manager for Sanitarium, said that the company was delighted to be working alongside the team at the University of Sydney.

"The partnership will assist us in continuing to create and produce great-tasting and nutritious products now and in the future, helping give families a healthy start to the day," Dr Ashton said.

Sanitarium will contribute to the funding of the Training Centre and will provide expertise and resources from Sanitarium's own Development and Innovation Centre that is located on the Central Coast in New South Wales.

## YOUNG QUEENSLAND BEEF LEADER WINS INAUGURAL ZANDA MCDONALD AWARD FOR 2015

Emma Hegarty, a 27-year-old beef extension officer with Queensland's Department of Agriculture and Fisheries, has been awarded the inaugural Zanda McDonald Award.

Presented at the Platinum Primary Producers (PPP) conference in Darwin, the award honours prominent Australian beef identity Zanda McDonald, who died in 2013 following a tragic accident on his Queensland property.

Ms Hegarty, from Colanya Station near Longreach, received the award for her leadership, respect, passion, drive, ambition and commitment to the beef industry.

Presenting the award, PPP chair Shane McManaway honoured foundation member of the PPP Zanda McDonald, and said Ms Hegarty clearly demonstrated "Zanda-like characteristics".

As part of the award, Ms Hegarty will receive a bronze award trophy, \$1,000 cash, a place on the 2016 Rabobank Farm Managers Program and an all-expenses-paid tailored mentoring package.



Emma Hegarty (centre) with Ben Russell of Rabobank (left), PPP chair Shane McManaway (right) and the McDonald family.

The PPP Group is a trans-Tasman networking collective that represents some 12 million hectares (25 per cent of land ownership) and around 20 million livestock units across Australia and New Zealand.





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## GOVERNMENT LAUNCHES AGRICULTURAL COMPETITIVENESS WHITE PAPER



*From left: Agriculture Minister Barnaby Joyce, Prime Minister Tony Abbott and Liberal MP Dan Tehan at the launch of the Agricultural Competitiveness White Paper in Victoria.*

Agriculture Minister Barnaby Joyce and Prime Minister Tony Abbott have released the long-awaited Agricultural Competitiveness White Paper, six months after its original release date.

Minister Joyce said the White Paper is an investment in Australian farmers and competitive strengths in agriculture.

“This is a vital part of our plan to build a strong, prosperous economy and a safe, secure Australia,” he said.

“A strong agriculture sector contributes to a strong economy – that means more jobs, more exports, higher incomes and better services to the community.

“We are determined to make the sector even more competitive and to deliver practical actions that will keep our farmers and farming families profitable and resilient,” said Mr Joyce.

Some of the key actions from the White Paper include lowering tax for farmers, building infrastructure, encouraging trade, developing northern Australia and supporting business to innovate and create jobs.

President of the National Farmers’ Federation, Brent Finlay, has praised the White Paper, saying it contains a number of valuable initiatives to boost the profitability and competitiveness of the Australian farm sector.

“The White Paper looks to create a stronger business environment for farmers and generate better returns at the farm gate.

“This is an important day for Australian agriculture. After almost two years, and more than 700 submissions, we finally

have a clear commitment from Government to foster a stronger, more prosperous and vibrant agriculture sector.

“With measures totalling more than \$4 billion, the White Paper seeks to balance tangible on-farm initiatives with long-term sustainability,” said Mr Finlay.

The White Paper addresses a number of Australian agricultural key priorities, with more tax breaks for struggling farmers, almost half a billion dollars designated to a national water infrastructure fund to improve dams around the nation and the appointment of a new umpire within the competition watchdog to help farmers settle supply disputes with supermarket giants.

Minister Joyce said the abolition of the carbon tax and the Growing Jobs and Small Business package announced in the Budget will also benefit 97 per cent of farmers.

“The White Paper is delivering a fairer go for farm businesses by creating a better business environment with better regulation, healthier market competition, competitive supply chains and an improved tax system.

“The long-term benefits of these Government investments are clear,” said Mr Joyce.

The White Paper was informed by comprehensive stakeholder consultation. More than 1,000 submissions were received and the Government talked face-to-face with more than 1,100 people across the country in developing the document.

For more information, the White Paper is available at [www.agwhitepaper.agriculture.gov.au](http://www.agwhitepaper.agriculture.gov.au).

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\*International Food Information Council, 2013



## AUSTRALIAN GOVERNMENT DEFINES NEW COUNTRY OF ORIGIN FOOD LABELLING

The Australian Government has announced that new country of origin food labels will begin to appear on supermarket shelves later this year.

The approved new food labelling system will show consumers where products are made, grown or packaged.

Foods processed locally will have a new label, which includes the familiar green and gold kangaroo and triangle icon, alongside a bar chart showing what proportion of the total ingredients are from Australia.

Companies are encouraged to provide additional information on their labels, such as identifying the origin of key ingredients.

Chief executive officer of the Australian Food & Grocery Council, Gary Dawson, said the announcement of the new food labelling rules are a recognition of the

importance of Australian jobs in the food production and processing sector.

"The retention of the term 'Made in Australia' and wider use of the well-known 'Australian Made' logo underlines the value of more than 300,000 jobs in Australia's food and grocery processing sector, with almost half of those jobs in rural and regional areas," Mr Dawson said.

"It will be important for the government, during the implementation phase, to understand the cost, complexity and additional red tape that these changes will impose, with the burden falling hardest on small businesses and those companies affected by seasonal variation in their sourcing.

"A flexible and practical approach, focused on the information that is most



valued by consumers, will be essential during the transitional phase," he said.

An initial voluntary take-up of the country of origin food labels will see changes occur on some products this year, with the mandatory roll-out commencing in 2016, with a phased implementation period for small business.

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## ASIAN MARKETS GOING NUTS



Australian almond producer, Select Harvests, has indicated that it is looking forward to a profitable almond crop with strong demand in the past year from key global markets, China and India.

Managing director Paul Thompson said that world almond prices are remaining firm and the release of the US June Almond Industry Position Report has reinforced the continuing strong demand for almonds in the face of restricted global supply.

“Total US shipments are down 6.4 per cent for the year to date. The drop in supply has maintained the pressure on almond pricing.

“In addition to being the largest almond producer, the US is also the largest global almond consumer and despite strong prices, they have just posted a record for June domestic shipments with 54.3 million pounds.

“Even more importantly, forward US domestic commitments are 135.5 million pounds, up 15 per cent on June 2014, presenting a confident forward outlook,” said Mr Thompson.

Strong demand is evident in other key global markets, with China up 62 per cent year on year for the month of June and India up 25 per cent this year.

“With 72 per cent of 2015 crop now processed, we now have greater clarity on both volume and quality. Subsequently, we have lifted the volume estimate to 14,500 tonnes from 13,400 tonnes.”

Mr Thompson said the recent cold snap in Australia ensures orchards have received enough chill between seasons, ready for the important bloom period at the end of winter.

“Strong global demand and constrained supply means stable pricing for the foreseeable future,” he said.

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PEOPLE



Dr Charles Rikard-Bell

**Pork CRC's new role**

Dr Charles Rikard-Bell has been appointed manager, commercialisation and research impact, at Cooperative Research Centre for High Integrity Australian Pork (Pork CRC). The role will generate revenue from Pork CRC research outcomes with identified genuine commercial potential.

Pork CRC chief executive officer Roger Campbell said Dr Rikard-Bell would also work with scientists to develop R&D projects with greater emphasis on commercial outcomes.

"Charles will bring considerable research and industry experience to our scientists and students, and will play a major role in the transition from the Pork CRC to an alternative R&D model for the industry over the CRC's remaining four years," Dr Campbell said.

For the past 11 years, Dr Rikard-Bell has worked for Elanco Animal Health, a division of Eli Lilly, before his most recent role as marketing manager—swine for the Asia Pacific Rim.

In other moves, research manager Graeme Cook left the company after working with Pork CRC for eight years.

"Graeme's contribution to Pork CRC has been exceptional and I thank him for all he has done on behalf of the management, board and participants. We wish him every success," Dr Campbell said.



Mr Pat Hannan

**New CEO at Growcom**

Queensland horticulture body Growcom has appointed Mr Pat Hannan as its new chief executive officer.

The news comes as Alex Livingstone departed the company in May, following a seven-year tenure as chief executive officer.

Growcom chair Jonathan Shaw thanked Mr Livingstone for his strong advocacy role on behalf of Queensland horticulture.

"We thank Alex for his efforts in building Growcom's reputation with government at all levels and in its pivotal role in representing Queensland horticultural growers' interests," Mr Shaw said.

Mr Hannan has experience within both State and Commonwealth primary industries departments, as well as consulting assignments with private companies working in the horticulture and not-for-profit sector.

"Mr Hannan has extensive experience as an executive level manager and leader within both the public and private sectors, with a focus on the financial industry," said Mr Shaw.

"Pat has a history of developing strong, productive relationships with all stakeholders, both internal and external, and is enthusiastic about pursuing the challenges of securing Growcom's future."

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Dr Vivien Kite

### Australian Chicken Meat Federation welcomes new executive director

Dr Vivien Kite has taken over as executive director of the Australian Chicken Meat Federation Inc. and Australian Poultry Industries Association.

Dr Kite is a longstanding member of the Executive Poultry Council and has served the

position of deputy executive director and R&D manager for more than 20 years. She has replaced Dr Andreas Dubs, who retired last July.

### CSIRO Board appointments



Mr Brian Watson

Minister for Industry and Science, Ian Macfarlane, has announced the appointment of Mr Brian Watson, and the reappointment of Ms Shirley In't Veld to the CSIRO Board.

Mr Macfarlane said both Mr Watson and Ms In't Veld have the skills, knowledge and business experience to help guide CSIRO's essential role in scientific development and putting science at the heart of the industry.

Mr Watson is executive chair of Georgica Associates Pty Ltd. Prior to this, he spent 16 years with JP Morgan & Co in a number of senior roles, including managing director of JP Morgan Partners Australia from 1999-2002.



Ms Shirley In't Veld

Ms In't Veld is an experienced Board director with broad energy sector knowledge and extensive experience as a senior business manager. She was previously a Board member with the Cooperative Research Centre for Landscape Evolution in Mineral Exploration at CSIRO.

"Ms In't Veld's background in commerce and law and her

world class experience in the energy ad resources sector are particularly relevant to the work of CSIRO and this reappointment provides ongoing corporate knowledge that will benefit the Board," said Mr Macfarlane.

"I warmly congratulate Mr Watson on his appointment and Ms In't Veld on her reappointment to the CSIRO Board. I look forward to their contribution to the work of the Board."

Mr Watson's appointment commences on 14 September. 📧



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## FROM THE CEO



I've just arrived back from NZIFST Conference in New Zealand and the IFT Expo in Chicago.

They were both great events with plenty

of inspiration. Speakers certainly threw down the gauntlet, challenging the food industry to move beyond renovation to true product innovation.

We are indeed operating in a global industry and it has never been more important to build our relationships with like-minded Institutes such as the NZIFST and IFT.

It's something that is firmly on the agenda at AIFST and as well as spreading our global ties, especially with institutes and organisations in Asia.

We are exploring the sharing of more services and resources with

likeminded institutes in international markets. The goal is to bring greater access to services, resources and tools to support AIFST members. We'll also be looking at how we can make the most of local partnerships such as those with CSIRO, AFGC and Food Innovation Australia to provide better value to members.

AIFST is evolving. We are committed to sharing knowledge that is ahead of global trends so you are able to use these insights to your competitive advantage.

We are currently focusing on getting the foundations right. This includes back-end efficiencies such as moving into our new North Sydney office and improving our IT capabilities to offer a website with a broader range of online services for members.

It's an exciting time and I can't wait to share more details in coming months.

Of course, on the immediate horizon,

we have the 48th Annual AIFST Convention and 15th Australian Food Microbiology Conference in Sydney on 11-13 August.

The wide variety of expert speakers, exhibitors and events will ensure that this will be the biggest food industry event in Asia Pacific this year and our best Convention yet.

During the Convention, we will be hosting our Annual General Meeting (AGM). We hope as many members as possible will attend.

We're counting down the days until the Convention starts and can't wait to see many of you there. To stay up to date with information and all the Convention chatter, simply keep an eye on our Facebook page – [www.facebook.com/AIFST.Ltd](http://www.facebook.com/AIFST.Ltd) – or follow us on Twitter @AIFST or join the conversation using #AIFST15.

**Georgie Aley**



### 2015 CPD Program

The 2015 CPD Program has a busy schedule of important events planned for the remainder of the year, all designed to support the ongoing skills and knowledge development of food industry professionals. Be sure to visit the CPD section on the AIFST website for more information and to register, or contact [bronwyn.graham@aifst.com.au](mailto:bronwyn.graham@aifst.com.au).

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**Sept 8 2015 – Who's Responsible?** is a one-day event on corporate governance

held at the Stamford Grand Plaza at Sydney's Domestic Airport. Designed for managers, directors and officers of fast moving consumer goods (FCMG) companies, the workshop will explore understanding your obligations, liabilities and risks, and how you can apply this knowledge.

The event will be presented by a number of key industry and regulatory bodies, including the Australian Food & Grocery Council, Australian Institute of Company Directors, AIFST and the Australian Competition and Consumer Commission.

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**Sept 22 2015 – The Fundamentals of Food Safety and Food Labelling** workshops will be held at the largest trade show in the southern hemisphere, Fine Food 2015, in Sydney. The two

sessions will examine the importance of staying up to date with food safety regulations, as well as the mandatory obligations and food labelling requirements for food businesses. The event will be held in conjunction with Correct Food Systems and the AFGC.

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**Oct 20 2015 – AIFST's 4th Innovation Masterclass** will be held in Melbourne. Innovate or evaporate – a bold statement, although one that must be considered if your business is going to survive and thrive in the highly competitive food industry. Key themes will cover the latest in innovation in industry from world-class speakers.



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# CONVENTION UPDATE



The 48th Annual AIFST Convention and 15th Australian Food Microbiology Conference is set to be bigger than ever, with more than 600 delegates, over 90 international local and international speakers and a hall full of exhibitors.

Sydney's iconic Luna Park will play host to three days of food science fun on 11-13 August. We would like to thank our sponsors for their ongoing support of the food industry, AIFST and the Convention.

The AIFST Annual General Meeting (AGM) will be held on Wednesday, 12 August 2015, from 5-6pm, during the Convention.

It will be held in the Ted Hopkins Room at Luna Park, Sydney. We look forward to seeing you all there.



## VALE: JEFFORY FAIRBROTHER

developing food ration packs.

Jeff continued to excel in this relatively new area of food technology, which was recognised in 1964 when he was awarded a Public Service Board Postgraduate Scholarship to study Food Technology at Ohio State University.

Jeff completed his PhD in 1966, returning to Australia to begin his career with the Commonwealth Government, where he was appointed principal chemist in the Department of Health as well as secretary of the Food Standards Committee of the National Health and Medical Research Council and ancillary committees.

Recognising the value of his work, Jeff was appointed as director of food with the Department of Trade and Industry in 1969.

Jeff left an important legacy in the Commonwealth Government, developing important improvements in food safety and food regulations right across the country.

In the 1970s, Jeff left the public sector to lead the Australian Poultry Industries Association and the Chicken Meat Federation as executive director.

These leadership skills were again recognised when he was appointed chair of the Institute of Rural Studies advising on agricultural education and

research, continuing on as a member of numerous advisory committees for government and several universities.

Jeff served on many poultry industry committees, including the Chicken Meat Research Committee, as president of the Australian branch of the World Poultry Science Association and chair of the Poultry Cooperative Research Centre.

Serving as the national president of the AIFST from 1983 to 1985 and two terms as honorary secretary and honorary treasurer, Jeff was the recipient of the Award of Merit in 1979 and the President's Award in 1994.

As a life Fellow of AIFST, Jeff achieved a most impressive record of devoted voluntary service to his profession.

He was appointed a Member of the Order of Australia in 2008, recognising his advocacy and research roles in the poultry industry, as well as his involvement with policy development in animal health and food safety standards.

Dr Fairbrother will always be remembered for his outstanding contribution to the Australian food industry, earning wide respect for his vigour, clear thinking, mature judgement, sound knowledge and fairness.

It is with great sadness that we say goodbye to past President and Life Member, Dr Jeffory Fairbrother after he passed away in June.

From early beginnings in the army, Jeff took what many thought as an unusual direction with his career, becoming one of the first full-time students in food technology in Australia.

Following his graduation from University of New South Wales with a Bachelor of Science, Jeff was appointed Officer in Charge of the Army Food Research Laboratories



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## VALE: DR PETER PARODI

It is with great sadness that we say goodbye to dairy legend Dr Peter Parodi, following his passing in July. He was an international authority on dairy nutrition, who through his length of service of more than 60 years, made a significant contribution to both human health and the dairy industry.

At the age of 18, Peter's first job was as a laboratory assistant at the Queensland Butter Marketing Board, where he stayed until the 1960s, when his focus shifted to developing methods to identify when butter had adulterated.

During the 1970s, Dr Parodi published pioneering research identifying and characterising previously unknown minor components of milk. In 1992, he embarked as the coordinator of Human Nutrition and Health Research for the Dairy Research and Development Corporation, now Dairy Australia.

He continued researching and writing scientific reviews until the point of his passing at age 81.

Throughout his extensive career in dairy, Dr Parodi's research brought new understandings to nutrition. His achievements and services have been recognised in the dairy industry with a number of prestigious awards, including the International Dairy Federation award for his lifetime contribution to dairy science in 2007, and the Danisco International Dairy Science Award in 2008.

# SCIENTIFIC EDITOR

THE AUSTRALIAN INSTITUTE OF FOOD SCIENCE & TECHNOLOGY LIMITED



**Location:** Sydney, NSW or various  
**Role Type:** Contract role/Not for profit  
**Remuneration:** Hourly rate upon negotiation

## Summary

- Seeking experienced scientific editor
- Must have strong background in food microbiology and active within past five years
- Editorial review of *Foodborne Microorganisms of Public Health Significance*

The Australian Institute of Food Science and Technology Limited (AIFST) is seeking an experienced scientific editor in a contract role to assist in the review of its publication, *Foodborne Microorganisms of Public Health Significance*.

The publication *Foodborne Microorganisms of Public Health Significance*, was first published by AIFST in 1974. The two-volume course manual was for an intensive laboratory course, devoted to the detection of microorganisms of public health significance in foods. The manual was updated and expanded for each new course, but with the increase in availability of food microbiology courses at universities, the need for a practical laboratory-based course diminished. However, the demand for the text continued, so the fourth edition of the publication appeared in 1989 as a single volume, with expanded information on the microorganisms but less detailed methodology. The demand for each edition grows every time it is published.

The seventh edition of *Foodborne Microorganisms of Public Health Significance*, affectionately known as the *Green Book*, is currently being reviewed and rewritten where required, to ensure it is up to date with the latest scientific information and industry practices.

AIFST is the peak body providing the leading voice in Australia for professionals in the food industry. Its purpose is to develop and promote their contribution to a world-leading food industry.

## Core competencies

- Strong background in food microbiology, with either practical and/or academic experience
- Active in the food microbiology profession within the past five years
- Demonstrated senior editorial experience
- AIFST member is highly desirable, however not essential
- Good communication and interpersonal skills required as well as ability to work as part of a small team
- Ability to manage and deliver a project on time.

## Proposed review timeframes

The project is to commence mid-January 2016 through to mid-April 2016. The revised publication will comprise of approximately 650 pages with an anticipated commitment of 100 hours to complete the review.

## Submitting expression of interest

Should you wish to provide an expression of interest to act as Scientific Editor, please forward your application, which clearly addresses the core competencies required and accompanying quote, to AIFST Office Manager Ms Julie Bennett via email [Julie.Bennett@aifst.com.au](mailto:Julie.Bennett@aifst.com.au). For more details, contact AIFST on 02 9394 8650.

**Applications close on 31 August 2015.**



AFGC

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# HEALTH CLAIMS – THE REGULATORY SAGA CONTINUES

*Standard 1.2.7 gazetted in 2013 promised a regulatory route to substantiated health claims. Almost three years on, where is it up to?*

Words by Dr Geoffrey Annison

In a saga lasting more than 20 years, 16 January 2013 was a pivotal day in developing the regulatory arrangements for governing the use of nutrition and health claims by the food industry in Australia and New Zealand. It was that day which saw gazettal of the new *Standard 1.2.7 Nutrition, health and related claims*.

*Standard 1.2.7* was feted by Food Standards Australia New Zealand (FSANZ) as heralding a new age of innovation opportunities for the food industry as the regulatory framework was established for *food/health* relationships to be assessed, and subsequently approved, for making claims. A three-year transition period was allowed for, providing companies ample time to adjust to the new standard.

With around 200 general level claims being allowed by immediate listing within the Food Standards Code at time of gazettal, appearances were that this was freeing industry from a regulatory prohibition on health claims. In fact, this was an immediate and dramatic increase in regulatory impost, as many of the claims had previously been used by food industry as permitted nutrient function claims. Furthermore, an additional regulatory hurdle came into force in the form of the Nutrient Profile Scoring Criterion (NPSC). Although, more on the issue of regulatory burden later.

Along with the gazettal of *Standard 1.2.7*, FSANZ announced that they would urgently review a number of claims approved in the European Union, with the intent of approving them for use

in Australia. Furthermore, a number of additional claims being used in Australia would also be reviewed, with the intent of substantiating the *food/health* relationship and allowing their continued use. This work was to be undertaken by FSANZ during the three-year transition period, i.e. before 16 January 2016. To assist FSANZ and at their request, the Australian Food and Grocery Code suggested a priority list of *food/health* relationships to be assessed during the transition period.

With some six months left until the end of the transition period, it's timely to provide a stocktake of progress. In the 30 months since the gazettal of *Standard 1.2.7*, the number of *food/health* relationships that FSANZ has assessed and approved is zero.

Furthermore, FSANZ informed the AFGC earlier this year that the number of *food/health* relationships it expects to assess before the end of the transition period is also zero. Clearly the optimism FSANZ displayed when gazetting *Standard 1.2.7* was misplaced, but the resulting dearth of approvals has fallen well short of even the AFGC's most pessimistic estimates of FSANZ's progress in examining the food and health relationships. To be fair, FSANZ in common with other Commonwealth agencies, has suffered staff cutbacks and it is understandable that some timeframes might stretch out a little due to resource constraints.

On the other hand, the complete failure to produce a single assessment in such a long period of time begs

the question: Is the whole process of assessing food and health relationships fundamentally flawed?

The unfortunate thing is that while regulators might ponder this question, the food industry is left wondering what to do about some claims which are currently used on food packs legally under the old Standard, but which would be illegal under the new Standard.

In reality, companies only have two choices:

1. Remove the claims from packs immediately and ensure all stock in trade is withdrawn; or,
2. Lodge a 'self-substantiation' notice with FSANZ so it appears on their register and ensure a substantiation dossier of scientific evidence supporting the claim is available on request.

Option 1 clearly has real costs that may be large.

Option 2 also has costs associated, particularly when one considers that each and every company making the claim must register the claim with FSANZ and must carry substantiating evidence for its claims. Further, Option 2 is only open for 'general level' health claims – there are some previously allowed functional claims which fall within the new Standard's definition of 'high level' health claims, and as these cannot be self-substantiated under the *Standard 1.2.7*, they are required to be progressed as an amendment to the Standard.

So all in all, in the last two-and-a-half years, we have gone from a relatively light touch of regulation on general level health claims (the old nutrient function

claims) to a heavier yoke of regulation. All this in the absence of any evidence that the claims previously appearing on food packs were detrimental to consumer health, or misleading to consumers. In fact, the Australian Consumer Law already applied stronger penalties than food legislation for false, misleading or deceptive claims. This is imposition of a greater regulatory burden on industry, and, at least at the time of writing, there is no light at the end of the tunnel suggesting an imminent turn around.

During the consultation period for the development of *Standard 1.2.7*, FSANZ indicated that levels of evidence for health claims – both general level and high level claims – had to be high. The AFGC had the view that the height of the [evidence] bar could be lower for softer general level claims, compared to high level claims.

Most of the claims FSANZ has been assessing are moderate and, at least in the view of the AFGC, supported by reasonable levels of evidence. One, for example, relates to resistant starch and reduced blood glucose after a meal. It is difficult to see why this type of food/health relationship could not be assessed, and approved, relatively quickly.

As long as there was some evidence supporting the softer claims, and little chance of consumer harm or consumers being misled, lower levels of substantiating evidence should be sufficient for regulatory approval. This is consistent with the principles of proportionate regulatory response for the protection of consumers. It also reflects approaches to levels of evidence with regard to dietary guidelines, where lower levels of evidence are not disqualifiers for some elements of dietary advice.

Interestingly, FSANZ's dogmatic approach in this area seems to have missed a fundamental point. *Standard 1.2.7* restricts health claims to those products which pass the NPSC. Thus, even if the evidence supporting health claims is at lower grade, as long as consumers are motivated to make the choice they will be choosing a product that is considered 'healthy'. This is the real value of the NPSC; it never was, and never will be, a scientifically robust measure of the 'healthiness' of a food product. Although, if it results in shifting some consumers in their food choices through links to health claims, it will perhaps provide some public health benefit.

Of course, this comment also applies to the Health Star Rating (HSR) front-of-pack labelling scheme, which utilises an algorithm based on the NPSC, but we can leave an assessment of the HSR for another day. In the meantime, the challenge for the AFGC is to move FSANZ from their entrenched position on substantiating health claims. Then perhaps the new age of a regulatory framework facilitating the marketing of innovative new products able to protect and promote good health may dawn, just as the regulator promised. <sup>4</sup>

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

LEARN MORE AT THE 48TH ANNUAL AIFST CONVENTION



*Hear Geoffrey Annison share his thoughts on Consumer trust, technology and the food industry – Is there a disconnect? at the food industry moderated round table on **Wednesday 12 August** at the AIFST Convention in Sydney.*

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# FOOD SAFETY AND STABILITY OF CHILLED FOODS

*The use of chill temperatures with food will reduce the rate and extent of microbial storage. What are the latest technologies helping to ensure food safety when they reach consumers? .*

Words by Sieh Ng, Cathy Moir, Debra Krause, Sandra Olivier, Peerasak Sanguansri, Kai Knoerzer, Roman Buckow and Mark Bradbury

The chilled foods sector covers an extremely broad variety of products ranging from minimally processed fruit and vegetables, to heat-treated, extended shelf life foods. Chilled foods are likely to contain a wide variety of microorganisms, present as either normal flora or from contamination during processing and handling. By lowering the storage temperature of food, the rate of food deterioration is reduced. Food generally spoils due to chemical, enzymatic and microbiological changes over time. The use of chill temperatures will favourably reduce the rate and the extent of microbial spoilage in foods. The key requirements for chilled food products are good quality and microbiological safety at the point of consumption.

## What determines microbiological risks in foods?

The microbiological risks of food can be influenced by the initial microbial load, type and composition of food (i.e. water activity ( $a_w$ ), the pH, acidity and nutrient content), as well as adequacy of processing treatments (i.e. heating, cooling, preservation, antimicrobial agents).

A high initial microbial load may be due to poor quality raw material or result from poor hygiene practices in the processing environment that leads to contamination. These factors can considerably shorten the shelf life of a food.

Water activity ( $a_w$ ) is a measure of the available (free) water in food. Higher



$a_w$  foods will support more microbial growth. The majority of bacteria require  $a_w > 0.91$ , and fungi require at least 0.7. To control major pathogens,  $a_w < 0.90$  is recommended. The exception is *Staphylococcus aureus*, which can grow at  $a_w \geq 0.85$ .

Every microorganism has a minimum, optimum and maximum pH for growth. At pH 7.0, most microorganisms grow comfortably while only a few grow below pH 4.0. Yeasts and moulds are generally more acid tolerant than bacteria, and can grow at lower pH values. The acidity of a food influences how pathogens will survive and grow. For chilled foods, pH  $< 5.0$  is critical to control the growth of non-proteolytic *C. botulinum*, the strains capable of growth at chill temperatures.

Time and temperature are further factors that can influence microbiological hazard in food. These

can be used to inactivate and/or control pathogenic microorganisms of concern and their subsequent growth and/or toxin production.

## Microbiological hazards in chilled foods

The predominant food safety concerns for chilled foods are psychrotrophic and spore forming pathogens. Psychrotrophs are microorganisms that grow slowly at refrigeration temperatures ( $< 4^\circ\text{C}$ ), but grow optimally above refrigeration temperatures (i.e.  $25\text{--}30^\circ\text{C}$ ). The non-sporeforming, facultatively anaerobic, psychrotrophic pathogens such as *Listeria monocytogenes* and *Yersinia enterocolitica* are able to grow at refrigeration temperatures.

Other non-sporeforming mesophilic, facultative anaerobic pathogens such as *Salmonella*, *Staphylococcus aureus* and *E.*



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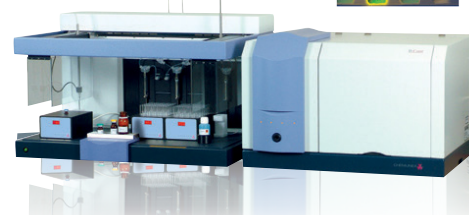
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*coli* generally have a minimum growth temperature above 7–10°C. They can also jeopardise the safety of food following temperature abuse.

Sufficient heat treatment (>75°C) will inactivate the vegetative cells of most pathogens, leaving sporeforming pathogens such as psychrotrophic *Clostridium botulinum* and *Bacillus cereus* as the key food safety concerns (Vijay *et al*, 2007).

However, if products are subjected to temperature abuse at any stage of their storage and distribution, there is a risk of growth of proteolytic and non-proteolytic *C. botulinum* with concomitant production of neurotoxin. Target microorganisms are the microorganisms that could be present in chilled foods and can cause illness if ingested.

Different categories of chilled foods based on shelf life and acidity, have different target microorganisms of concern as listed in Table 1.

### Listeria monocytogenes

*Listeria monocytogenes* is a gram-positive non-sporeforming, facultatively anaerobic, rod-shaped bacterium. It is psychrotrophic, so able to grow at refrigeration temperatures. *L. monocytogenes* is widespread in the environment and often carried by domestic and wild animals. It can be found in milk, cheese, vegetables, fish, seafood, meats and poultry. It is known to cause food-borne disease outbreaks associated with the consumption of soft cheeses and ready-to-eat meats, often affecting the elderly, immunocompromised patients and is especially dangerous for pregnant women as it can cause spontaneous abortion or foetal death, still birth and meningitis.

### Clostridium botulinum

*Clostridium botulinum* is a ubiquitous anaerobic spore-forming bacterium whose spores can be found in soil, fresh water and marine environments. There are two types of *Clostridium botulinum* associated with foods – proteolytic and non-proteolytic strains. Proteolytic type

Table 1. The target microorganisms in cook chill foods

Product category	Microbial targets of process		
	Vegetative cells	Spores	Pathogens
Short shelf life (≤10 d) Low-Acid Foods (pH > 5)	✓	✗	Infectious pathogens; <i>E. coli</i> , <i>Salmonella</i> , <i>L. monocytogenes</i> <i>viruses (NoV, HAV)</i>
Extended shelf life (>10 d) Acid foods (pH ≤ 5)	✓	✗	
Extended shelf life (> 10 d) Low-acid foods (pH > 5) ± other hurdles	✓	✗	Toxigenic pathogens; Sporeformers: <i>Non-proteolytic Clostridium botulinum</i> <i>Bacillus cereus</i>
Extended shelf life (>10 d) Low-acid foods (pH > 5)	✓	✓	

A and B strains produce highly heat resistant spores and have a minimal growth temperature of 10°C. Therefore, as long as processed food is properly refrigerated, proteolytic *Clostridium botulinum* will not pose a problem.

On the other hand, non-proteolytic *Clostridium botulinum* spores have reduced heat resistance, and can grow and produce toxin at temperature as low as 3.3°C (Light *et al*, 1990). Consequently, spores that survive thermal treatment may still pose a hazard even when food is refrigerated. In order to minimise growth of these spores, alternative control measures such as pH and  $a_w$  can be factored in to product and process development.

### Types of chilled foods

Chilled foods include products ranging from minimally processed fruits and vegetables (fresh cuts) to cook chill foods that may be packaged before (sous vide) or after cooking. Two shelf-life categories are defined for cook chill products:

i. short shelf life (SSL), where the food

has been cooked for two minutes at 70°C, permitting a refrigeration shelf life of < 10 days

ii. extended shelf life (ESL), where food has been cooked for 10 minutes at 90°C, permitting a shelf life of > 10 days (NSW government Food Authority, NSW/FA/CP058/1207). The pathogens of concerns in SSL and ESL cook chill foods are shown in Table 2.

### Controlling risk-factors – food safety program

A Hazard Analysis Critical Control Point (HACCP)-based food safety program is a recognised measure for assuring the safe processing and production of chilled foods. An HACCP plan identifies and assesses food safety hazards with regards to microbiological, chemical and physical issues. The plan considers preservatives,  $a_w$  product acidity, redox potential, potential for proliferation of psychrotrophic microorganisms to occur in the event of temperature abuse during storage and transportation,



and the growth of spore-formers in an extended shelf life, low acid product.

### The hurdle concept

The hurdle concept involves applying various hurdles of different intensity to minimise the microbial load/growth, thereby extending the shelf life of food (Leistner, 2000), as shown in Figure 1 (on the next page). Hurdle technology has been used in the preservation of food for centuries. Typically, hurdles are temperature (high or low),  $a_w$ , acidity (pH), redox potential and preservatives (e.g. nitrite, sorbate, sulphite).

The inclusion of additional or new hurdles may allow a reduction in the concentration of existing (less preferred) hurdles to achieve product safety and extended shelf life.

### Using technologies to overcome microbiological risks


Traditionally, thermal processing is one of the most common food processing technologies used to ensure food safety. The thermal processing technologies include pasteurisation (generally used for liquid foods such as milk) and retorting for more viscous semi-solid and solid foods. However, as consumer demand for fresher, tastier and more nutritious food increases and lifestyles forever change, novel non-thermal processing technologies have emerged in the past two decades.

### High pressure processing

High pressure processing (HPP) presents an exciting opportunity for innovation in the chilled foods sector. The advantages brought by HPP include products with an extended shelf life that retain improved texture, more natural colour, enhanced nutritional value and a reduced or eliminated need for chemical preservatives.

For high acid chilled foods such as fruit juices, HPP treatment alone is generally sufficient to satisfy microbiological safety and stability requirements. CSIRO has demonstrated that for navel orange juice, HPP processing was able to reduce the total aerobic bacteria and yeast and mould counts to  $< 2 \log_{10}$  cfu/mL and  $< 1.5 \log_{10}$  cfu/mL respectively, following 12 weeks storage at 4°C. In contrast, untreated navel orange juice was only

Table 2. Microorganisms of concern in cook chill foods prepared for Short Shelf life (SSL) and Extended Shelf life (ESL).

Cooking Time/Temp	Cooking -2 min @ 70°C	Cooking - 10 min @ 90 °C
<b>Min growth temp</b>	<b>LOW</b>	<b>HEAT RESISTANCE</b>
	<b>HOT</b>	
		
	Vegetative organisms	Spore-forming organisms
<b>Low</b>	<i>Listeria monocytogenes</i>	
<b>&lt; 5°C</b>	<i>Yersinia enterocolitica</i>	<i>C. botulinum</i> – nonproteolytic
	<i>Vibrio parahaemolyticus</i>	<i>Bacillus cereus</i> – diarrhoeal
<b>Medium</b>	<i>Salmonella</i> spp.	
	<i>Escherichia coli</i>	
<b>5-10°C</b>	<i>Staphylococcus aureus</i>	
<b>High</b>		<i>Bacillus cereus</i> – emetic
	<i>Campylobacter jejuni</i>	<i>C. botulinum</i> – proteolytic
<b>≥10°C</b>		
<b>Shelf life</b>	<b>SSL – Shelf life &lt; 10d</b>	<b>ESL – Shelf life &gt; 10d</b>

microbiologically acceptable for 14 days. This showed that HPP could be used to extend the shelf life of navel orange juice (Bull *et al*, 2004).

For low acid foods (i.e. ready-to-eat meals and meal components), simultaneous high pressure/thermal (HPT) processing is required to inactivate bacterial spores. Due to the synergistic effect of pressure and temperature on the inactivation of spores, food safety targets can be achieved at lower temperatures and/or with shorter processing times compared to a thermal process alone. Using either HPP or HPT, the shelf life of cook chill products can also be extended. CSIRO research has found that HPT delivers a higher inactivation of non-proteolytic *Clostridium botulinum* than thermal only treatment (Kraft patent).

### Pulsed electric field technology

Non-thermal pulsed electric field (PEF) processing technology has been harnessed for its ability to deliver safe and chill stable fruit juices with fresh-like sensory and nutritional properties. PEF is used in Europe to extend the stability of chilled fruit juices, including citrus juices and smoothies, from six days to 21 days (Buckow *et al*, 2013).

Research at CSIRO with PEF demonstrated its ability to inactivate pathogens such as *E. coli* and *Salmonella* *Senftenberg* in apple juice. PEF treatment

achieved an inactivation of  $5 \log_{10}$  cfu/mL, using an electric field strength of 21 kV/cm, processing temperature of 50°C and treatment times of 70 and 75  $\mu$ s, for *S. Senftenberg* and *E. coli* ATCC 11775, respectively (Ng *et al*, 2011).

PEF has also demonstrated  $> 5 \log_{10}$  cfu/mL inactivation of pseudomonads in milk, thereby showing potential application in the dairy industry for shelf life extension (Craven *et al*, 2008).


### Future directions

HPP and PEF have been accepted as environmentally friendly processes able to inactivate vegetative microorganisms, as well as retain the fresh-like characteristics of food when compared to more conventional heat treatments. However, industrial applications have been limited to specific products and markets, with the high capital cost of equipment and batch operation being some of the reasons for the technologies not being more widely adopted. The economic viability of HPP and PEF technology directly depends on the cost benefit identified for a specific product application.

It is important for food manufacturers to remain abreast of the varied microbiological safety and quality issues associated with the extensive range of chilled food types and categories. The safety



and stability of chilled foods can be achieved through product formulation, microbiological risk assessment and process design to control risks associated with food-borne diseases. The implementation of an HACCP plan that is guided by scientific evidence of risk to human health, good manufacturing practice, controlled storage and distribution, appropriate packaging and compliance with relevant food standard guidelines, will ensure product safety.

CSIRO Food Innovation Centre has successfully partnered with the food industry in various aspects of food safety and stability. 

*The lead author Sieh Ng is a food safety microbiologist working within CSIRO's Food Safety and Stability Group of the Food Nutrition Flagship. She has a track record of assessing food safety risks to consumers and improving product safety.*

*Co-author Cathy Moir is a food microbiologist and team leader at CSIRO's Food and Nutrition Flagship. Do not miss her presentation on Consumer and manufacturing food trends and food safety risks on day one, 11th August 2015, at the 48th Annual AIFST Convention and 15th Australian Food Microbiology Conference.*

## References

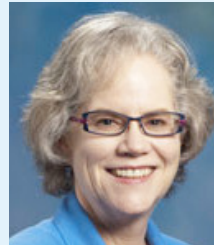
1. Bull M. K., Zerdin K., Howe E., Goicoechea D., Paramanandhan P., Stockman R., Sellahewa J., Szabo E. A., Johnson R. L. and Stewart C. M., 2004. "The effect of high pressure processing on the microbial, physical and chemical properties of Valencia and Navel orange juice." *Innovative Food Science & Emerging Technologies*, Vol 5, p. 135-149.
2. Craven H. M., Swiergon P., Ng S., Midgely J., Versteeg C., Coventry M. J. and Wan J., 2008. "Evaluation of pulsed electric field and minimal heat treatments for inactivation of pseudomonads and enhancement of milk shelf-life." *Innovative Food Science and Emerging Technologies*, Vol 9, p. 211-216.
3. Kraft patent W/O2008/083216 A1, 2008. Legan J. D., Chapman B. L. and Bull M. K. "Process for reducing spore levels in compositions."
4. Light N. and Walker A., 1990. "Cook-Chill Catering: Technology and Management." Elsevier Science Publishing Co. Inc.
5. Leistner L., 2000. "Basic aspects of food preservation by hurdle technology" (Review). *International Journal of Food Microbiology*, 55, p 181-186.
6. Leistner L. and Gould G., 2002. "Hurdle Technologies. Combination treatments for food stability, safety and quality." Chapter 2, The Hurdle Concept. Kluwer Academic/Plenum Publishers, New York.
7. Ng S., Knight G. and Buckow R., 2011. "Pulsed Electric Field inactivation of *Escherichia coli* and *Salmonella Senftenberg* in apple juice." The proceeding of the 14th Australian Food Microbiology Conference/2nd IAFP Asia Pacific Symposium on Food Safety, Melbourne, 26-28 September 2011.
8. NSW Government Food Authority. "Sous vide – Food safety precautions for restaurants," NSW/FA/CP058/1207, p 1-29.
9. Roman B., Ng S. and Toepfl S., 2013. "Pulsed electric field processing of orange juice: a review of microbial, enzymatic, nutritional, and sensory quality and stability" *Comprehensive reviews in food science and food safety*, Vol 12, p 455-467.
10. Vijay K. J. and Oscar P. S., 2007. "Advances in thermal and non-thermal food preservation." Chapter 8 – "Sous vide and cook-chill processing of foods; concept development and microbiological safety." Blackwell publishing.

## LEARN MORE AT THE 48TH ANNUAL AIFST CONVENTION



*Cathy Moir will be presenting on Consumer and manufacturing food trends and food safety risks on Tuesday 11 August 2015 during Session 3.*

## FOOD SAFETY AT THE CONVENTION



### Dr Linda Harris

International specialist in microbial food safety, Dr Linda Harris, from University of California, Davis, will address global trends in the food sector and the challenges and solutions to providing a safe and sustainable food supply.

As a specialist in Cooperative Extension in Microbial Food Safety in the Department of Food Science and Technology, Dr Harris's expertise lies in food safety and microbiology throughout the food chain.

Presenting on Global Food Safety, Dr Harris will highlight the importance of ensuring all stakeholders within the food industry share responsibility to successfully manage food safety across the supply chain.

Dr Harris will discuss the challenges of controlling foodborne pathogens in low-moisture foods, including many pantry staples such as cereals, confectionery, spices, dried milk and nuts. She will also share her insights on opportunities to use new technologies to improve safety of these low-moisture foods.

Dr Harris will be presenting at the Convention:

- Global trends in food safety on Tuesday 11 August in the Plenary Session
- Food industry moderated round table on Wednesday 12 August in the Plenary Session
- Low-moisture foods – food safety challenges and opportunities on Thursday 13 August during Session 1
- IAFP Information Session on Thursday 13 August during Session 2.



### Dr Laura K Strawn

This is the information age. Globally, there are more than 3,000 tweets a second, more than 1.6 billion online searches a day and every two days the world produces the same amount of information as was created between the dawn of civilisation and 2003.

In her presentation at the Convention, Dr Laura Strawn, Assistant Professor and Extension Specialist in the Department of Food Science and Technology at Virginia Tech, will illustrate how big data has the promise to help food safety professionals make better informed decisions.

Dr Strawn will be presenting at the Convention:

- Big data and omics on Wednesday 12 August 2015 during Session 1
- Geographic information systems, big data and food safety on Thursday 13 August 2015 during Session 1.



# CSIRO'S FOOD INNOVATION CENTRE

*CSIRO's food innovation centre makes it easy for food, ingredient and equipment manufacturing companies to access our extensive expertise, technologies and support in innovation.*



*From improving process efficiency and adopting innovative technologies, to creating high value products for new markets, CSIRO's food innovation centre is the most extensive food innovation provider to industry in Australia.*

CSIRO has recently helped their clients to:

- commercialise more than 25 new products, ingredients and technologies
- grow their sales by hundreds of millions of dollars
- create world-first competitive advantages such as patents and licensing
- position themselves for early adoption of the next wave of transformative innovations

CSIRO's food innovation centre works with industry every day to turn aspirations into impact, competitive advantage and profits.

[food-innovation@csiro.au](mailto:food-innovation@csiro.au)

[www.csiro.au/food-innovation](http://www.csiro.au/food-innovation)



## HEALTHIER MEALS FOR THE COMMUNITY'S MOST VULNERABLE

Community Chef is a social enterprise that provides quality meals for people nutritionally at risk, often the elderly, people with a disability, hospital patients and aged care residents. The company collaborated with CSIRO and Food Innovation Australia Ltd (FIAL) through their SME Solution Centre to support the long-term food security and nutritional wellbeing of those most vulnerable in the community.

### Too much food, not enough nutrition

Community Chef is the largest provider of prepared meals for the aged and disability care sector in Australia. They are passionate about providing a leadership role in advancing the nutrition of meals.

Feedback from their clients was that current meal sizes were too large and so they were not eating all the food provided. This meant that clients were not getting adequate daily nutrition. Some clients reported that they preferred to skip meals in order to not waste food.

The company needed a process for modifying their recipes to increase the nutritional density and reduce the portion size of meals, while still conforming to or exceeding the Commonwealth and Victorian Government Home and Community Care (HACC) guidelines.

### Nutritional profiling and assessment of meals

Our dietitians, trained in nutritional profiling of foods and food components, assessed and remodelled some of the company's most popular menu items. We looked at total energy, protein and a range of macro and micronutrients of concern for the aged



Joe Ciccarone (right), Community Chef chief executive officer.

population at risk of malnutrition, such as fibre, zinc, iron and calcium. We also matched the meals to the HACC guidelines and the Nutrient Reference Values specific to the ageing populations, as set by the National Health and Medical Research Council.

We then developed recommendations for the energy and protein required for nutritionally dense, reduced portion meal components such as soups, desserts and sides to assist the company with future recipe development.

### Increasing the nutritional density of prepared meals

We increased the nutritional density of many dishes by fortifying recipes through the use of whole foods and whole food additives, such as skim milk powder. This enabled Community Chef to reduce the portion sizes slightly, while maintaining or improving the protein density of the meal, leading to less food wastage.

Our recommendations set a benchmark for defining the appropriate energy and protein content of various meals, which allows the company to mix and match meal components and still meet the nutritional requirements of the meal overall.

It became clear that the current HACC meal service guidelines,

although updated in 2013, may need revising in light of considerable changes in life expectancies and dietary, social and cultural behaviours, which could affect the specific dietary requirements for aged populations.

Watch the video on [www.csiro.au/food-innovation](http://www.csiro.au/food-innovation).

Contact: [food-innovation@csiro.au](mailto:food-innovation@csiro.au)

### CSIRO'S FOOD INNOVATION SEMINAR PROGRAM

CSIRO's food innovation centre holds a range of innovation events, seminars and workshops for the food and ingredient manufacturing industry.

For the latest events, visit: [www.csiro.au/food-innovation](http://www.csiro.au/food-innovation)

## CSIRO SIGNS UP AUSTRALIA TO THE GLOBAL FOOD TRACEABILITY CENTRE



From left: Joe Giblin, Icon Global; Dr Will Fisher, formerly executive director of the Global Food Traceability Centre; Dr Anne Astin, AIFST chair and president; Professor Martin Cole, director of CSIRO's Food and Nutrition Flagship.

CSIRO has become the first Australian member of the Global Food Traceability Centre. The Centre, launched in 2013, looks at the challenges and opportunities of implementing food traceability across global networks and supply chains.

"Food traceability isn't just about helping manage a food safety emergency or product recall, although it can significantly reduce the costs if it does happen," Dr Kari Gobius, CSIRO's research leader for food safety, said.

"Traceability also has less obvious but proven economic benefits such as improved risk management, supply chain efficiencies and confidence, inventory accuracy, brand reputation and access to new markets and customers."

A high-profile example of poor traceability is the *E. coli* outbreak of 2011. The source was at first thought to be Spanish cucumbers and the industry destroyed millions of dollars' worth of produce. The contamination was later traced via German sprouts to fenugreek seeds from Egypt. Fifty-three people died and the whole European produce

market was adversely affected over the course of the outbreak.

As a member of the Centre, CSIRO will be able to provide Australian industry with the latest research in the area, develop traceability knowledge here and adapt outcomes for Australian conditions.

At a forum chaired by AIFST chair and president Dr Anne Astin and hosted by the Safe Food Forum, CSIRO and Food Innovation Australia on 28 April, Australian and international experts in food traceability met with Dr Will Fisher, the then vice-president of the Institute of Food Technologists and executive director of the Global Food Traceability Centre.

"Traceability is the systematic ability to access any or all information relating to a food under consideration, throughout its entire life cycle, by means of recorded identifications. It's not just about data, identifiers, bar codes, RFID and tags," Will said.

With a rise in high visibility food-borne outbreaks, product recalls, counterfeit products, imports from countries with lower standards,

complex supply chains and consumer concerns about health and safety risks, there is an urgency for industry to step up on traceability.

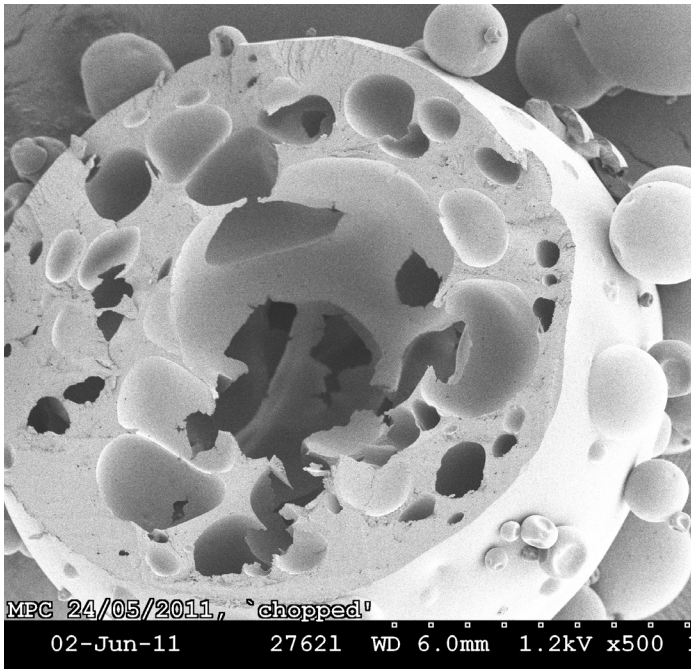
"In the world of food safety, we can no longer learn from our mistakes," said Dr Gobius.

"We have to prevent mistakes from happening in the first place."

The Safe Food Forum is an initiative under the auspices of the National Food and Nutrition Research and Development and Technology Transfer Strategy and is a taskforce of national food safety experts from industry, regulatory authorities and researchers including CSIRO.

Contact: [food-innovation@csiro.au](mailto:food-innovation@csiro.au)

## A NEW, WORLD-FIRST FOOD PROCESSING TECHNOLOGY



An electron micrograph of extrusion porosified (EPT) powder.

France's leading extrusion technology company, Cletral, along with Australian food process expert company, Inovo, and CSIRO's food innovation centre, have developed a world first transformative technology that could develop brand new food products with improved functionality using far less energy than currently needed.

The potential value in future manufacturing of foods and ingredients such as dairy powders, flavours, coffee, nutraceuticals and beverages is estimated in hundreds of millions of dollars. The world's first pilot-scale set-up is at the Werribee site in Victoria, and the Australian company, Flavourtech, is a commercialisation partner for the technology for tea and coffee globally.

The patented extrusion porosification technology (EPT) process can dry numerous products and ingredients with higher solids content, and operate at a lower temperature than regular spray drying. This gives products unique characteristics and improved functional properties. EPT not only saves large amounts of energy but also causes significantly less damage to a food's flavour and nutritional composition.

Contact: [food-innovation@csiro.au](mailto:food-innovation@csiro.au)

## MEET THE CSIRO FOOD INNOVATION CENTRE TEAM



### Meet Sieh Ng

Sieh Ng is a food safety microbiologist and works with national regulators and industry to investigate product microbial contamination issues and solve food safety and quality problems.

Ms Ng has extensive expertise in helping industry adopt innovative processing technologies for the production of fresher and healthier foods.

She is the food safety and quality contact for the food innovation centre.

### Sieh Ng

Food microbiologist  
CSIRO's food  
innovation centre  
[Sieh.Ng@csiro.au](mailto:Sieh.Ng@csiro.au)



### Meet Lloyd Simons

Lloyd Simons is responsible for business development activity in CSIRO's food manufacturing portfolio.

In recent years, he has worked on many company engagements, totalling over \$10m in company R&D investment and over \$200 million in commercialisation of new ingredients and food products.

Mr Simons and CSIRO's food innovation centre can help make it easy for companies to innovate.

### Lloyd Simons

Business development  
manager  
CSIRO's food  
innovation centre  
[Lloyd.Simons@csiro.au](mailto:Lloyd.Simons@csiro.au)



# FOOD TV: AN EFFECTIVE STRATEGY FOR FOOD AND BEVERAGE MARKETING?

*As the popularity of food television continues to grow, businesses are turning to new marketing approaches to get them on TV screens nightly. Is it worth the time and money invested?*

Words by Dr Michelle Phillipov

Food and beverage marketing has become more sophisticated and complex in recent years. Today's consumers are increasingly cynical about conventional advertising strategies, so traditional methods of advertising and marketing are now often less effective than they may have once been.

As a result, businesses are turning to newer approaches that involve integrating marketing and promotional strategies across a range of media platforms.

Among the various options, television is often seen as a particularly attractive option for promoting food and beverage businesses. From primetime ratings hits, like *MasterChef* and *My Kitchen Rules* (MKR), to niche programs aimed at 'foodie' audiences, such as *Gourmet Farmer*, *Ben's Menu* and *Paddock to Plate*, food television has become a mainstay of public, commercial and cable TV, with programs frequently reaching large, national audiences.

Many food television programs commonly feature food and beverage products and producers, making them seem ideally suited to food and beverage promotion.

However, television's promotional opportunities do not necessarily benefit all businesses equally. Television's mainstream prominence, and the significant profile that this affords producers, means that it offers some key advantages and



*Running for the past seven years, Network 10's MasterChef Australia is currently located in Melbourne.*

pitfalls that are worth considering before engaging with the medium.

## Types of food television appearances

With the exception of paid advertisements during commercial breaks, there are two main mechanisms through which food and beverage producers can access the promotional potential of food television.

The first is through formalised sponsorship arrangements. The food and beverage products and producers who appear on major primetime shows like *MasterChef* and *MKR* are largely the result of these kinds of relationships. These are negotiated deals, the details of which are highly confidential, but which result in the brands of sponsors appearing within

episodes in the form of product placement, integration of brands in storylines, branded tie-ins and other kinds of branded content.

When the *MKR* contestants cook for the farmers who supply fresh produce to Coles, or when the *MasterChef* contestants relax at home drinking Vittoria coffee, these are some of the results of formalised sponsorship deals.

The promotional value of these deals is massive. For example, the success of Coles' sponsorship of *MasterChef* and *MKR* has been credited with helping the supermarket chain close the profit gap with rival Woolworths.<sup>1</sup> These deals are also expensive, demanding the kind of marketing budget only possible for larger businesses.

Another method that food and beverage producers can use to get

their products on television is through more informal arrangements with the show's production team. These are characteristic of niche programs, such as *Gourmet Farmer* and *Paddock to Plate*, which due to broadcaster regulations, budgetary constraints, conventions of the format, and/or nature of the program, do not (or cannot) offer formal sponsorship deals.

In these cases, the focus is usually on small food and beverage producers, who are identified and contacted through a range of means, including online calls for expression of interest and recommendations from the shows' hosts, and then assessed for suitability by the programs' producers.

Appearing on these types of programs generally does not require any payment from the food or beverage producer, although in-kind contributions of time and/or food and beverage products are typical. These types of 'free' appearances can offer great value for small businesses, without the resources of other forms of advertising, marketing or sponsorship.

### Opportunities for brand management

Irrespective of the type of arrangement, or whether the business is big or small, appearing on food television can result in increased sales of food and beverage products—by up to as much as 1,400 per cent for some major television cooking shows.<sup>2</sup> While the value of short-term sales surges is not to be dismissed, the real benefits are in the longer-term promotion and brand management opportunities that can be built through media appearances.

For instance, when *MKR* contestants cook for Coles' farmers, the strategy is not specifically to increase sales for the lamb farmer, the watermelon farmer, or any of the other individual producers that may have appeared in the episode (although this may have indeed been one of the outcomes). Rather, the aim is to boost the reputation of Coles' fresh produce more broadly. This is a phenomenon referred to

as 'brand trait transference'.<sup>3</sup> In this case, the 'culinary capital' of *MKR* is symbolically transferred both to the supermarket chain and to the producers who supply it.

This also applies to small food and beverage producers involved with niche programming. In these cases, the show's politics of valuing local, ethical, artisanal production can become linked to those of the food and beverage producers who appear on screen.

### Remember: good television comes first

Food television can offer excellent promotion and brand management opportunities, but whether you are considering engaging in a formal brand partnership or participating in a 'free' television appearance, there are some key things to keep in mind.

First and foremost, it is vital to remain conscious of the fact that although brand promotion may be your main goal as a business operator, this is not necessarily a priority for the media production company or the broadcaster.

Even in paid sponsorship arrangements, the production team will require that branded content be an appropriate fit for the televisual context and be carefully integrated into storylines. If you are engaging in these types of arrangements, then you will typically have the resources to hire experts to help navigate the complex world of television sponsorship, but things can still go wrong.

The derision to which Handee was subject when its paper towels featured too prominently on *MasterChef*, is a lesson in what happens when promotion misses the mark.<sup>4</sup>

If you are a smaller food and beverage producer making your own arrangements directly with a television production company, it is important to remain conscious of the potential mismatches between your needs and expectations as a business owner against the needs and expectations of media producers seeking to make 'good television'.

Many food and beverage producers

who appear on food television feel disappointed at what they perceive to be an insufficient focus on their products or inadequate depth of coverage of their production practices. However, television shows are designed not with the promotion of producers' products in mind, but with a focus on audiences, entertainment value and commercial viability.

Excessive focus on products is boring for audiences and can be a ratings killer, particularly during primetime. Consequently, whenever the needs of food and beverage producers and media producers diverge, the needs of the television industry will almost always be prioritised.

### Any publicity is not good publicity

The second thing to keep in mind is that not all promotional opportunities are created equal. If your primary market is demographically similar to the audience of the television show on which you have been invited to appear, then there is a potential to reap great benefit from your appearance on food television. But if, for example, your primary market is the restaurant industry yet the television show is watched mainly by the general public, then this opportunity is unlikely to offer many benefits.


The mantra of 'any publicity is good publicity' is simply not true of the food and beverage sector. Speaking to the wrong audience can result in wasted time, such as a large number of phone calls or emails from interested viewers who may not be the target market for your products, and may not even be able to purchase the products they have seen on screen.

Television production is time consuming, therefore it is necessary to assess whether there is likely to be sufficient 'value for money' from your time investment. A few minutes of on-screen time can take a day or more to film, so it is vital not to expect that a time commitment of this length will necessarily result in extensive on-air coverage.

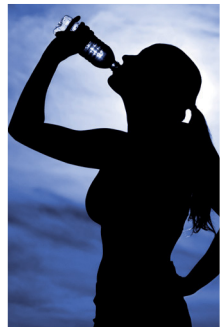




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It is also important to anticipate unexpected audience responses. You may or may not see an increase in product sales in the short-term. It may be disappointing not to see an immediate return on your efforts, but the opportunities of food television are best leveraged not as a short-term mechanism for increasing sales, but as part of a broader strategy of profile building and brand management.

Whether you are a small producer or one of the 'big boys', any appearances on food television should form part of a larger promotion plan. This can involve appearances across a range of media forms and platforms in order to consolidate your brand identity, help people remember your brand, and link your brand to other like-minded media properties and personalities.

### Tips for getting the best results

1. *Anticipate the increased customer contact that can result from a food television appearance.* Make sure

your website is comprehensive and up-to-date. An engaging 'form letter' that provides information about you, your business and your products, and which you can email to interested customers, is also a good idea.

2. *Thoroughly research the show before agreeing to appear.* It is just not a case of 'any publicity is good publicity'. For best effect, the right message needs to reach the right audiences. Find out who the show's audience is and determine whether this is the right target market for your products.
3. *Be realistic about likely outcomes.* The promotional opportunities afforded by food television are best leveraged when used as part of a longer-term brand management strategy rather than as something expected to produce immediate results, so they should be approached in these terms. 

*Dr Michelle Phillipou is an Australian Research Council Discovery Early Career Researcher Award Research Fellow and Senior Lecturer in Journalism, Media and Communications at the University of Tasmania.*

### References:

1. Janda, M. 2010. "Coles sales climb on *MasterChef* bandwagon." *ABC News*, 26 July, [www.abc.net.au/news/2010-07-26/coles-sales-climb-on-masterchef-bandwagon/920014](http://www.abc.net.au/news/2010-07-26/coles-sales-climb-on-masterchef-bandwagon/920014).
2. Sinclair, L. 2010. "*MasterChef* sparks Coles sales surge." *The Australian*, 21 June, 32.
3. Arsena, A., D.H. Silvera, and M. Pandelaere. 2014. "Brand trait transference: When celebrity endorsers acquire brand personality traits." *Journal of Business Research*, 67, 1537-1543.
4. Media Watch. 2010. "Here's One I Prepared Earlier." *ABC TV*, 21 June, [www.abc.net.au/mediawatch/transcripts/s2932975.htm](http://www.abc.net.au/mediawatch/transcripts/s2932975.htm).



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## FOOD SAFETY – IT’S EVERYONE’S BUSINESS

*The NSW Food Authority, Australia’s first and only wholly integrated (through-chain) food regulatory agency, works closely with industry to provide confidence and certainty for business at each step of the food supply process, ensuring that at the end of the food chain, consumers have access to safe and clearly and accurately labelled food.*

The NSW Food Authority recently unveiled its Food Safety Strategy 2015-2021: Safe food from paddock to plate with a view to providing food safety, confidence and certainty across the food supply chain.

NSW Food Authority CEO Polly Bennett said the highlight of the strategy for industry is her organisation’s commitment to education, innovation and low cost regulation.

“At the Food Authority we see our role as being there to support and increase the food business sectors’ contribution to the state’s economic growth and prosperity,” she said.

“Our aim is to help industry get on with business safely and efficiently without unnecessary burden.

“This commitment is demonstrated through our red tape reduction target of \$4.5 million by 2021, on top of \$6 million already achieved in streamlined regulatory processing.”

Ms Bennett said the outcome of a supported food industry is:

- Safe food production and less foodborne illnesses
- Certainty and confidence for consumers and all food operators
- Innovative and productive food industries
- Globally competitive food businesses.

“We are continually working to identify points along the food chain

where risks around food handling could be reduced,” she said.

“By targeting efforts where risks are highest we are able to keep the cost of regulation low, but ensure the end product is safe and superior and that producers can secure premium prices based on that excellent reputation.

“Experience shows that demonstrated food quality and safety is a market differentiator in the local and global market place.

Our goal of a 30 per cent reduction in foodborne illness by 2021 is achievable with improved food safety practices, verification programs on farms and at processing facilities and first class nationally recognised training across the retail sector.”

The NSW Food Authority works in collaboration with scientific and educational and industry partners in targeted research and development programs to advance scientific knowledge in an effort to improve policy, regulation and food handling processes.

“Each year \$3million of our budget is allocated to maintaining collaborative research, conducting food surveys, providing expert advice to stakeholders and consumers and carrying out risk assessments,” Ms Bennett said.

“We also work with our consultative committees across a variety of industries

including eggs, meat, dairy, seafood, plant products and food services in vulnerable populations to ensure we are servicing industries effectively and to drive innovation through investigating and developing sophisticated technology driven business practices.”

Ms Bennett said reliability in practice and reputation is also achieved through preparedness, traceability and response when faced with a need for food recall or a food safety event.

“Effective and timely foodborne illness investigation, food recall processes and emergency food incident responses are key for both industry and government because the damage, particularly reputational, can be long lasting and negatively affect domestic and international markets,” she said.

“Continued science-led assessment, effective multi agency and industry collaboration and appropriate education, information, support and response, will ensure we deliver confidence and certainty for the food industry and consumers into the future.”

The NSW Food Authority’s Food Safety Strategy 2015-2021 can be viewed at [www.foodauthority.nsw.gov.au](http://www.foodauthority.nsw.gov.au).



Department of  
Primary Industries  
Food Authority



# MYCOTOXIGENIC FUNGI IN A CHANGING WORLD

*Climate change is facilitating the growth of a number of fungi into areas and crops that were previously unaffected. What are the consequences for the Australian food industry?*

Words by Ailsa Hocking and Nai Tran-Dinh

## Global climate change outlook

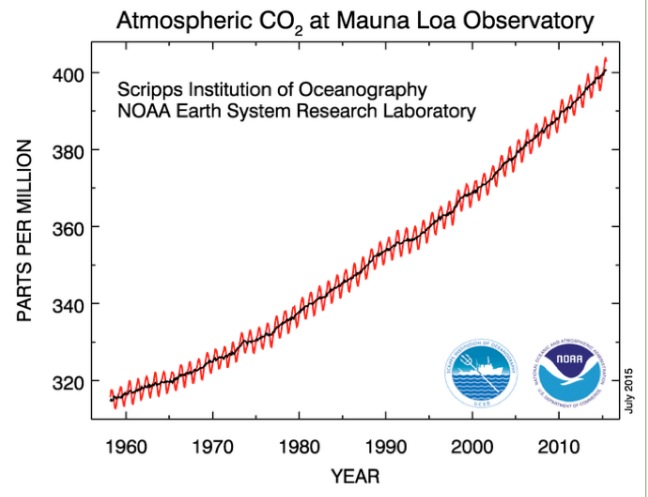
The Earth is undoubtedly warming and human activity, particularly the burning of fossil fuels, is at least partly responsible for these changes. Since the beginning of the 20th Century, the global mean temperature has increased by approximately 0.75°C, with atmospheric CO<sub>2</sub> concentration increasing from 280ppm in 1750 to almost 403ppm in 2015.<sup>1,2</sup> (Figure 1)

Several major studies have been published with predictions of various scenarios for global warming, from the most optimistic being warming by 4-5°C by the end of this century.<sup>3,4,5</sup> Since 1910, Australia has become hotter, with warming across the continent of 0.9°C, increased rainfall in northern Australia and a decrease in south-east and south-west Australia.<sup>5</sup> Global warming will affect food security, with changing climate patterns, including longer, hotter drought periods and more intense storm systems, restricting and changing the areas suitable for growing crops. Drought-stressed plants are more susceptible to disease, and crops subjected to water damage may be more easily attacked by insects and fungi.

## Source of mycotoxins – pre-harvest versus post-harvest

Mycotoxin contamination of staple food crops, including maize, peanuts and wheat, occurs mainly during maturation, immediately pre-harvest, or even resulting from physical damage during harvesting. Poor storage post-harvest

**Figure 1.** Monthly mean atmospheric carbon dioxide at Mauna Loa Observatory, Hawaii. The carbon dioxide data (red curve), measured as the mole fraction in dry air, on Mauna Loa constitute the longest record of direct measurements of CO<sub>2</sub> in the atmosphere. The black curve represents the seasonally corrected data.



Source: [www.esrl.noaa.gov/gmd/ccgg/trends](http://www.esrl.noaa.gov/gmd/ccgg/trends)

can exacerbate the mycotoxin problem.

Wheat is susceptible to fusarium head blight (FHB) caused by *Fusarium graminearum*, *F. culmorum* and related species, all of which produce a range of trichothecene toxins, including deoxynivalenol (DON).

Peanuts can be colonised by *Aspergillus flavus*, *A. parasiticus* and related species. If the crop is drought-stressed, particularly near harvest, aflatoxins can be formed in the nuts pre-harvest. Delayed drying after harvest, which may be due to rain or very high humidity, can exacerbate the problem, with aflatoxin content increasing during the critical first few days after harvest.

Maize is susceptible to both aflatoxin contamination and *Fusarium*-associated mycotoxin contamination (trichothecene and fumonisin toxins).

The co-occurrence of mycotoxins, particularly *Fusarium* and *Aspergillus* toxins, in crops has been reported and may synergistically increase mycotoxin contamination and toxicity.<sup>6</sup>

Other crops are also susceptible to pre-harvest colonisation by potentially mycotoxigenic fungi. Bunch rot in grapes destined for the production of wine and dried fruit, is caused by black *Aspergilli*, and one of these, *A. carbonarius*, is a potent producer of ochratoxin A (OTA). Coffee beans can also be contaminated by black *Aspergillus* spp. during drying, with formation of OTA.

Many tree-nut crops can be colonised by aflatoxigenic *Aspergillus* species, especially if they are attacked by insect pests such as light brown apple moth, which bore into the developing nuts, allowing entry of the fungal spores.



## Effects on crops and pathogens

**Wheat and small grains** – In Europe, changes in mycotoxin contamination of small grain crops, particularly wheat, could be attributed to changes in climate patterns and rising temperatures. There has been an observed change in the profile and infection of wheat and barley by FHB pathogens and trichothecene contamination. In cooler temperate areas of Europe, *F. culmorum* has been the prevalent FHB pathogen, although in the last decade, *F. graminearum*, which is a higher toxin producer, has become dominant over *F. culmorum*.<sup>7,8</sup> This change has been accompanied by changes in crop rotation and the increasing use of maize for animal feed.<sup>8</sup>

Maize is a well recognised reservoir for *F. graminearum*, and increasing temperatures are allowing maize to be grown at more northern latitudes. In Canada, a change in DON-producing chemotypes *F. graminearum* has seen an increase in strains producing a modified form of DON called 3ADON which is more toxigenic and has greater ecological fitness than the 15ADON chemotype, with implications for higher rates of FHB and higher trichothecene levels in wheat.<sup>7</sup> Madgwick *et al.*<sup>9</sup>, using predicted changes in physical weather, have used modelling to predict that by the 2050s, there will be an increased risk of FHB epidemics in the UK, and an increase in crops with mycotoxin levels exceeding the limits set by the European Union.

In China, cereal production has increased five-fold since 1961, with the ratio of rice to wheat and maize production changing from 1.2:1 to 0.8:110. FHB poses a serious threat

to the yield and quality of wheat in China, with increased exposure to DON and other trichothecene toxins, with maize being inherently more susceptible to mycotoxin contamination than rice. Similar problems may occur in other developing countries where more wheat is being grown to meet increasing consumption of wheat-based foods.

**Maize** – In northern Italy's cheese-producing regions, maize is a key crop for dairy cattle and is grown in a temperate climate that is conducive for *F. verticillioides* infection. In 2003-04, however, northern Italy experienced a very hot, dry growing season and conditions were more favourable for the growth of *Aspergillus* than *Fusarium*, resulting in the first report of aflatoxin contamination in Italian maize with consequent aflatoxin M1 contamination of cheese.<sup>11</sup>

In Africa, maize is an important staple in many countries. There have been outbreaks of human aflatoxicosis in Kenya several times since 1981, but in 2004, there was a particularly deadly episode which took at least 125 lives.<sup>12,13</sup> Africa is particularly susceptible to threats to food security from climate change<sup>7</sup>, so consumption of low-grade grains contaminated with fungi and mycotoxins, may become more frequent.

**Peanuts** – Peanut plants can be colonised by *Aspergillus flavus* at any stage throughout the life of the plant. If the plants experience high soil temperatures and drought stress, particularly in the final 4-6 weeks of pod filling, aflatoxins are likely to be formed in the nuts. Extremes of temperature are more likely to occur with global warming, which means that peanut crops may be of greater risk of aflatoxin contamination in the future. Irrigation can ameliorate the situation, but is not usually an option in most places where peanuts are grown, particularly for subsistence crops in Africa.

Biocontrol using non-toxigenic *A. flavus* to exclude colonisation of plants by toxigenic strains is one means of reducing the aflatoxin burden in peanuts. Researchers in Australia have developed a model, based on soil moisture and temperature to predict the Aflatoxins Risk Index (ARI), which can inform farmers of the likely risk of aflatoxin formation so they can time the harvest of their crop and manage the postharvest phase to minimise aflatoxin formation.<sup>14</sup>

The model can also assist maize farmers, showing that both dry and hot climates make maize much more prone to higher aflatoxin risk. This predictive model may be of assistance to peanut and maize growers elsewhere in the world.

**Grapes** – Contamination of grapes with ochratoxin A (OTA) is a more recently recognised mycotoxin problem (late 1990s). *Aspergillus carbonarius*, *A. niger* and related species cause bunch rot, which can be exacerbated by insect damage, and rain close to harvest, followed by warm, humid weather.

OTA contamination is a greater problem in warmer climates, with crops in Mediterranean countries particularly susceptible. Using geostatistics, Battilani *et al.*<sup>15</sup> analysed weather patterns over three years. The results found that the highest incidence of *A. carbonarius* was likely to be in Greece, southern

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France and southern Italy. This correlated well with OTA contamination of wines in these regions. Global warming may move the OTA risk further north into European countries that currently do not usually see this problem in grape crops.

### The Australian situation

Under the various climate change scenarios, Australia faces temperature rises with more frequent and severe droughts in some areas, particularly in the prime grain-growing areas south-east and south-west of the continent, possibly leading to an increased food safety threat due to mycotoxin contamination of crops such as corn, wheat and peanuts. More intense rain systems are also predicted.<sup>5</sup>

If these changes affect the health of food crops, then the plants will be more susceptible to fungal disease and potential mycotoxin contamination, possibly leading to an increased food safety threat due to mycotoxin contamination. However, predictive tools such as those developed for the peanut industry in Australia,<sup>14</sup> and for FHB in wheat in the UK and Europe,<sup>9</sup> together with good agricultural practice, should assist food producers in managing this mycotoxin risk. 🍌

*Ailsa Hocking is an honorary research fellow in the Division of Animal, Food and Health Sciences at CSIRO. Nai Tran-Dinh is a molecular microbiologist at CSIRO and is a convention co-chairperson.*

### References

1. Nefftel, A., et al. "Evidence from polar ice cores for the increase in atmospheric CO<sub>2</sub> in the past two centuries." *Nature*, 1985. 315: 45-47.
2. NOAA/ESRL. "National Oceanic and Atmospheric Administration, US Department of Commerce, Earth System Research Laboratory." [www.esrl.noaa.gov/gmd/ccgg/trends](http://www.esrl.noaa.gov/gmd/ccgg/trends) Accessed July, 2015.
3. EC (European Commission). 2007. "Adapting to climate change in Europe – Options for EU action." Green Paper from the Commission to the Council, the European Parliament, the European Economic and Social Committee of the Regions, SEC Brussels, Belgium: European Commission.
4. IPCC (Intergovernmental Panel on Climate Change) 2014. Fifth Assessment Report (AR5). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., et al. (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1132 pp.
5. CSIRO and Bureau of Meteorology, 2015. Climate Change in Australia. Information for Australia's Natural Resource Management Regions: Technical Report, CSIRO and Bureau of Meteorology, Australia
6. Schatzmayr, G. and Streit, E. "Global occurrence of mycotoxins in the food and feed chain: facts and figures." *World Mycotoxin J.* 2013. 6: 213-222.
7. Chakraborty, S., and Newton, A.C. "Climate change, plant diseases and food security: an overview." *Plant Pathol.* 2011. 60: 2-14.
8. Magan, N., Medina, A. and Aldred, D. 2011. "Possible climate change effects on mycotoxin contamination of food crops pre- and post-harvest." *Plant Pathology* 60, 150-163.
9. Madgwick, J.W., et al. "Impacts of climate change on wheat anthesis and fusarium ear blight in the UK." *European J. Plant Pathol.*, 2011.130: 117-131.
10. Miller J.D. "Mycotoxins in small grains and maize: old problems, new challenges." *Food Additives and Contaminants: Part A Chemistry, Analysis, Control, Exposure & Risk Assessment*, 2008. 25: 219-230.
11. Piva, G., Battilani, P. and Pietri, A. 2006. "Emerging issues in southern Europe: Aflatoxins in Italy." *Mycotoxin Factbook: Food & Feed Topics*, Barug, D; Bhatnagar, D; Van Egmond, HP et al., eds Wageningen Academic Publishers. pp. 139-153
12. Azziz-Baumgartner E., et al. "Case-Control Study of an Acute Aflatoxicosis Outbreak, Kenya, 2004." *Environmental Health Perspectives*, 2005.113: 1779-1783
13. Probst, C., Njapau, H. and Cotty, P.J. "Outbreak of an Acute Aflatoxicosis in Kenya in 2004: Identification of the Causal Agent Applied and Environmental Microbiology, 2007." 73: 2762-2764.
14. Chaugan Y.S., et al. "Application of a model to assess aflatoxin risk in peanuts." *J. Agric. Sci.*, 2010. 148: 341-351.
15. Battilani P, Barbano C, Márin, S, Sanchis V, Kozakiewicz Z, Magan N. "Mapping of *Aspergillus section Nigri* in Southern Europe and Israel based on geostatistical analysis." *Int. J. Food Microbiol.*, 2006. 111: S72-82.



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# PATENTS VS TRADE SECRETS IN THE FOOD SECTOR

*Protecting food manufacturing processes using patents is a common industry practice. However, why seek patent protection, given the risk of exposing details of a process as a trade secret?*

Words by Dr Chris Vindurampulle

Obtaining a patent requires disclosure of the invention to the public, this disclosure generally being the antithesis of a trade secret. However, whereas patents have a limited lifespan (usually 20 years), the lifespan of a trade secret can be indefinite. This being the case, maintaining a trade secret can be difficult and costly in today's competitive market place.

Technological advances may allow competitors to develop similar processes independently or by analysing your commercial product. Patents can therefore be a useful tool in an intellectual property (IP) arsenal that, when implemented together with other IP rights protection measures, can aid in deriving value and maintaining an all-important competitive edge against competitors.

Two recent Australian court cases highlight that innovating in the food sector may not always be straightforward. In these cases, the players have used the patent system to protect and enforce their rights.

## **Novoenzymes vs Danisco**

The Australian court cases reflect a dispute between Danish biotech-based companies Novozymes A/S ('Novozymes') and Danisco A/S ('Danisco'). Core to the dispute is the manufacture of baked foodstuffs containing 'functional ingredients'.

The term 'functional ingredient' has different meanings depending on the context in which it is used. When



broadly defined, a functional ingredient can be any constituent that performs a specific function in a foodstuff, other than supporting good nutrition.

The process of Danisco's patent relied on an enzyme being able to produce two functional ingredients from constituents present in the starting food material, before inactivation during the baking process. Common enzymes used in industry are proteins derived from microorganisms, which are used as catalysts in biochemical reactions. Enzymes used as a processing aid during the production of foodstuffs, but which are ultimately inactivated during production, are not considered to be additives. Therefore, there is a benefit in using enzymes in foodstuff production from both industry and consumer perspectives.

In the lower court<sup>1</sup>, Danisco asserted infringement of its patent by virtue of the promotion and supply by Novozymes of Lipopan Xtra for producing baked goods. Lipopan Xtra is the trademark given to a lipase enzyme which acts on fats found in animal and vegetable oils to produce lipids with emulsifying properties. These lipids can, for example, be used in dough to increase the softness of baked bread. In the context of Danisco's patent, the lipids produced by Lipopan Xtra are considered to be functional ingredients.

In defence, Novozymes challenged the validity of Danisco's patent on several grounds. Of particular interest was the assertion that Danisco's invention lacked novelty over an earlier Novozymes patent. An example in that



earlier patent described the use of an enzyme (a phospholipase also having lipase activity) as a “bread-improving agent”. While the specification disclosed phospholipases as having dual activity, the invention was directed to improving bread by reducing phosphorous-containing components.

The potential of the phospholipase to produce functional ingredients, in the same manner that a lipase might, was not known around the time that Novozymes’ patent was filed. Nevertheless, Novozymes submitted that use of the phospholipase according to the example would inevitably result in the process of Danisco’s patent. This argument was rejected, in part because there was no disclosure or recognition of the production of functional ingredients in Novozymes’ patent. The case was ultimately decided in Danisco’s favour.

### Invalidation of Danisco’s patent

Novozyme subsequently appealed to the Full Federal Court on this issue of ‘inevitable result’.

In Australia, there exists a court-formed principle concerning anticipation by inevitable outcome. This principle can be summarised as follows: “If carrying out directions contained in a prior publication will inevitably result in something being made or done which would constitute

an infringement of a claim, the claim has in fact been anticipated”.

In reconsidering Novozymes’ earlier patent, the Full Bench of the Federal Court rejected the primary judge’s findings in relation to anticipation by inevitable outcome.<sup>2</sup> It was considered that the primary judge had erred in interpreting the above principle, and in not fully appreciating expert testimony and evidence supporting the view that Novozymes’ phospholipase, if used according to the method of Novozymes’ patent, would have inevitably produced functional ingredients. It was therefore unnecessary that there be an explicit or implicit disclosure of the production of functional ingredients by phospholipase in Novozymes’ patent to render Danisco’s patent invalid.

### Implications for your business

The food sector is highly competitive. Coupled with the increasing demand from consumers for ‘additive-free’ food products and increasingly restrictive food labelling requirements, manufacturers will be motivated to develop new cost-effective processes for creating food products containing functional ingredients, irrespective of whether these ingredients perform “functions” in foodstuffs and / or provide health benefits, in addition to supporting nutrition. Patents will be key to protecting these processes

where maintaining details of the processes and know how as trade secrets might not be possible.

It is unclear how much due diligence was undertaken by Danisco in developing its processes, or whether Danisco was aware of Novozymes’s earlier patent. The head-to-head between these companies in court highlights the importance of conducting detailed market and competitor analyses before driving innovation in a business, whether large or small. Failing to do so will likely result in unnecessary expenditure or worse. ①

### References

1. Danisco A/S v Novozymes A/S (No 2) [2011] FCA 282.
2. Novozymes A/S v Danisco A/S [2013] FCAFC 6.

*Dr Chris Vindurampulle is an associate patent and trade marks attorney at Watermark Intellectual Asset Management.*

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DAIRY

# INNOVATION HUB FUELS GROWTH OF AUSTRALIA'S DAIRY INDUSTRY

*The Dairy Innovation Hub was awarded \$5 million in the ARC Industrial Transformation Hub grant scheme in early 2014, boosting the research and innovation capability of Australia's food industry.*

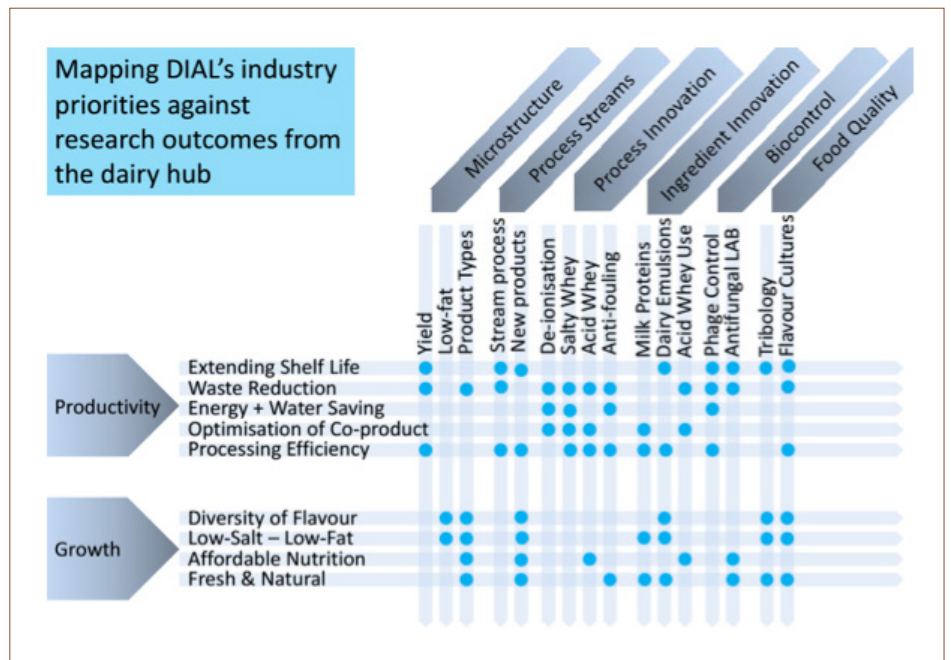
Words by Barbara Meurer, Martin Palmer and Sally Gras

The Australian Research Council (ARC) Dairy Innovation Hub brings together three of Australia's leading dairy research groups – University of Melbourne (UM), University of Queensland (UQ) and Dairy Innovation Australia Ltd (DIAL) in a five-year research program co-funded by the dairy industry and the ARC. Dairy industry participants, including dairy manufacturing companies and Dairy Australia, collectively matched ARC funding for the Hub, and play an active role in the research program. After 18 months of operation, the Hub is looking at its first achievements.

## Achieving relevance and impact for dairy manufacturing

The secret to the early success of the Hub was good planning and industry involvement from the start. DIAL played a key role in the planning and development of the Hub proposal, building on its well-established relationship with member dairy companies, as well as its track record of successful research collaboration with both universities.

As an expert knowledge provider in the domestic dairy industry and in overseas target markets, DIAL helped to develop Hub projects that address important scientific and technical challenges faced by Australian dairy manufacturers. DIAL's expert staff and purpose-built innovation facilities also contribute to Hub projects, assisting translation through pilot-scale trials and industry engagement.



Both universities have key capabilities in dairy science and engineering focused in the Department of Chemical and Biomolecular Engineering, The School of Chemistry and the Bio21 Molecular Science and Biotechnology Institute at University of Melbourne, and within the School of Agriculture and Food Sciences at University of Queensland.

These capabilities include key scientific equipment, from microscopes to tribometers, and a critical mass of researchers with an established track record working with the Australian dairy manufacturing industry. Together, these three organisations have been able to apply these leading

multidisciplinary capabilities to develop innovative projects targeting the solutions needed by industry.

A consortium of Australia's largest dairy companies, representing 70 per cent of our milk production, directed the setting of priority targets for increasing growth and productivity of the industry. These include DIAL member companies Murray Goulburn Co-operative, Bega Cheese, Warrnambool Cheese & Butter, Lion Dairy and Drinks and Parmalat Australia, as well as the peak industry body, Dairy Australia. Hub director, Associate Professor Sally Gras, along with the eight other chief investigators from UM and UQ, worked closely with



*The team of Hub and DIAL scientists. Prof Aidan Byrne, ARC CEO (centre right), officially opened the Hub on 22 July 2014 at DIAL. Centre front row: Hub director, A/Prof Sally Gras (UM) with Dr Lesley MacLeod (CEO, DIAL) and Prof Bhesh Bhandari (UQ).*

DIAL and its member companies to develop a suite of research focus areas, with strong potential to be translated into innovative products, new product assessment tools or sustainable processing methodologies. Consultation with dairy manufacturing companies distilled the focus into six strategic research themes: microstructure of dairy products, innovation through stream specific processing and separation technologies, ingredient innovation, biocontrol and food quality.

Chaired by DIAL's chief executive officer Dr Lesley MacLeod and working with the Hub's Industry Advisory Committee, the participating dairy processors contribute direction to research projects, participate in on-site case studies and where appropriate, provide product for analysis, making this a truly industry-focused ARC Industrial Transformation Hub. While the primary research outcomes are collaboratively directed and shared, the broader capabilities are built for the industry as a whole. These capabilities are accessed by companies for commercial projects such as case studies and confidential consultancy

projects that directly increase the competitiveness of each company in a growing market and deliver an immediate translation into applications.

### **Hub research themes achieve tangible outcomes**

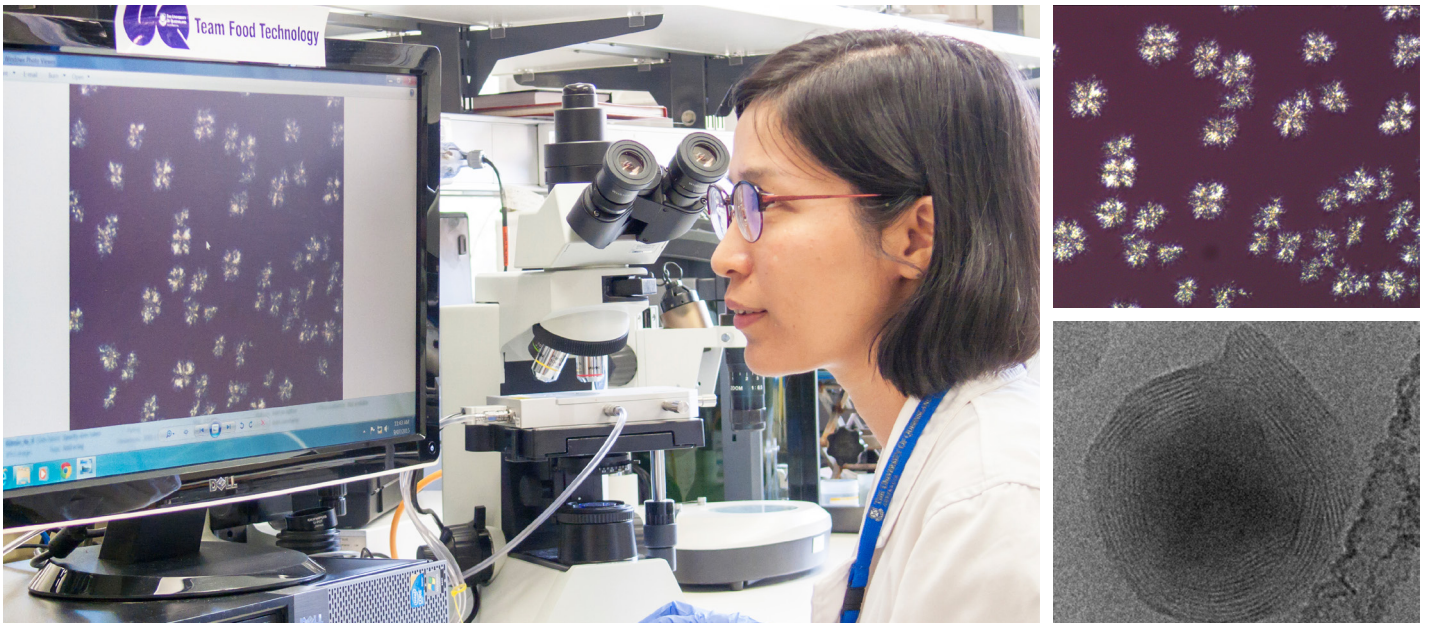
Led by Professors Sandra Kentish and David Dunstan (UM), the Process Innovation theme focusses on new separation technologies and methods for the prevention of equipment fouling. One project is evaluating an anti-fouling coating for stainless-steel surfaces that are in contact with milk processing streams. Lab-scale trials have proved successful to date with the technology now being evaluated at pilot manufacturing scale, using DIAL's pilot-scale UHT plant and fouling rig. The coating is derived from food safe ingredients, is heat resistant, and would substantially reduce plant down-times and cleaning costs.

Another project in this theme is focusing on membrane treatment of 'acid whey' – a by-product arising from the manufacture of cream cheese and Greek-style yoghurts. Manufacture of these products has increased in

recent years, due to increased demand from both domestic retail and export ingredient markets. The associated increase in acid whey production is proving problematic for many companies, as this material is difficult to purify using readily available technologies and disposal is expensive as trade waste.

Following an extensive review of alternative technologies used in other industries and consultation with DIAL member companies, the UM team selected nanofiltration and electrodialysis as having good potential for lactose recovery and lactate ion removal – two of the key technical challenges in the valorisation of acid whey. Laboratory trials have been encouraging and the next stage in the research will be an evaluation on DIAL's pilot-scale membrane plant or within a member company.

In the Food Quality theme at UQ, the team led by A/Prof Mark Turner is applying new genomics and microanalytical techniques to better understand the role of 'adjunct cultures' in the ripening and flavour development of Australian cheeses. The team has



Hub research fellow Dr Tuyen Truong (UQ) analyses the microstructure of milk fat crystals as visualised under polarised light microscopy (PLM) (top right) and cryogenic transmission electron microscopy (cryo-TEM) (bottom right), respectively.

recently established methods for volatile screening of cheese aroma compounds, which will provide dairy companies with new tools to control the ripening of existing products and develop new cheese products with different flavour profiles. Dairy companies are already using this new flavour analysis capability to assist in quality control and help predict optimum ripening times for hard cheeses.

Product texture and mouthfeel are very important attributes of dairy foods and often determine whether a consumer likes or dislikes a product. The most commonly used method to characterise mouthfeel is sensory analysis using consumer trained panels. While this is the 'ultimate' test that every food product needs to pass, it can be a very expensive undertaking for a manufacturer for routine quality control and product development.

In another Food Quality project at UQ, Dr Sangeeta Prakash is leading a project to develop an instrumental method known as Tribology that may be more cost effective, faster to use and provide more objective and reproducible data. This technique uses a 'tribometer' – essentially a highly sensitive rheometer, modified to measure the lubrication properties of

materials between two surfaces. The project has already established very strong correlations between tribometer data and sensory analysis for various milks, dairy beverages and semi-solid dairy products.

In the Ingredient Innovation theme, Professor Bhesh Bhandari's team at UQ has discovered new ways to modulate the crystallisation behaviour and emulsion stability of dairy fats and fat fractions. These approaches have been used successfully in the laboratory to manipulate the hardness and spreadability of milk fat and are now being evaluated for more complex food systems. The research demonstrates how emulsion structure (droplet size and size distribution) affects the stability and shelf life of dairy-based beverages, cream cheese and whipping creams. It can also be applied to develop desirable new product properties such as easier spreadable butter, or more stable whipping creams.

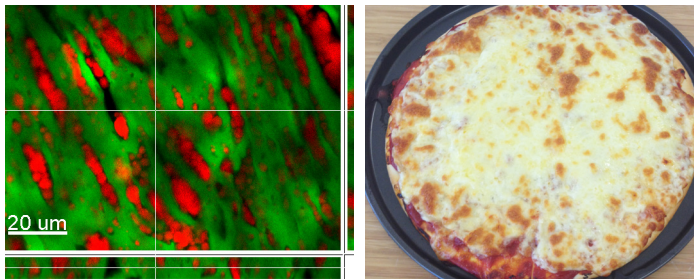
Led by Assoc. Prof. Sally Gras at UM, the microstructure theme is applying high resolution imaging technologies such as scanning electron (cryo-SEM), confocal (CLSM), atomic force microscopy (AFM) and transmission electron microscopy (TEM), to analyse the microstructure of dairy products

such as cream cheese and yoghurt. It is only in the past few years that these powerful techniques, together with sophisticated data and image analysis systems, have been more widely applied to the study of hydrated food structures.

Hub researchers are providing a window into the development and stability of dairy food structures through the manufacturing process, during storage and handling and at the point of consumption or further processing as an ingredient. Results from this research help understand, model and predict variations in product quality associated with changes, for example in formulation, processing conditions and shelf life.

Work to date on cream cheese, cheddar cheese, yoghurt and mozzarella has shown that many aspects of both product quality and processing history can be mapped to product microstructure and provide fresh insights to conventional physical and chemical analysis.

After only 18 months, the ARC Dairy Innovation Hub is kicking goals. There are now nine projects running across six themes employing eight post-docs, two research assistants and two PhD students, with a further two PhD students joining the UQ team in 2015.



Top: Hub PhD student Anita Pax (UM) measures the stretch of mozzarella cheese. Bottom left: Mozzarella cheese structure is assessed by Confocal Laser Scanning Microscopy, where the protein network appears green and the fat appears red. Bottom right: An industry standard pizza bake test assesses cheese browning.

New synergistic collaborations have been developed, not only between Hub researchers and dairy companies but also with leading international dairy research groups, such as the French National Institute for Agricultural Research and Ireland's Teagasc. Hub Key Performance Indicators (KPIs) are carefully monitored and reported back to the ARC and industry sponsors, with a quick analysis showing the Hub is exceeding expectations.

In May this year, DIAL was awarded the Victorian Manufacturers' Hall of Fame for Professional Services Award, in recognition of its services to the dairy industry. The ARC Dairy Innovation Hub aims to build on this strong record of service, delivering scientific and engineering solutions to increase productivity, growth and sustainability in an area of significant economic importance for Australia's future.

*Drs Barbara Meurer and Martin Palmer are the Dairy Innovation Australia representatives on the Hub Management Committee.*

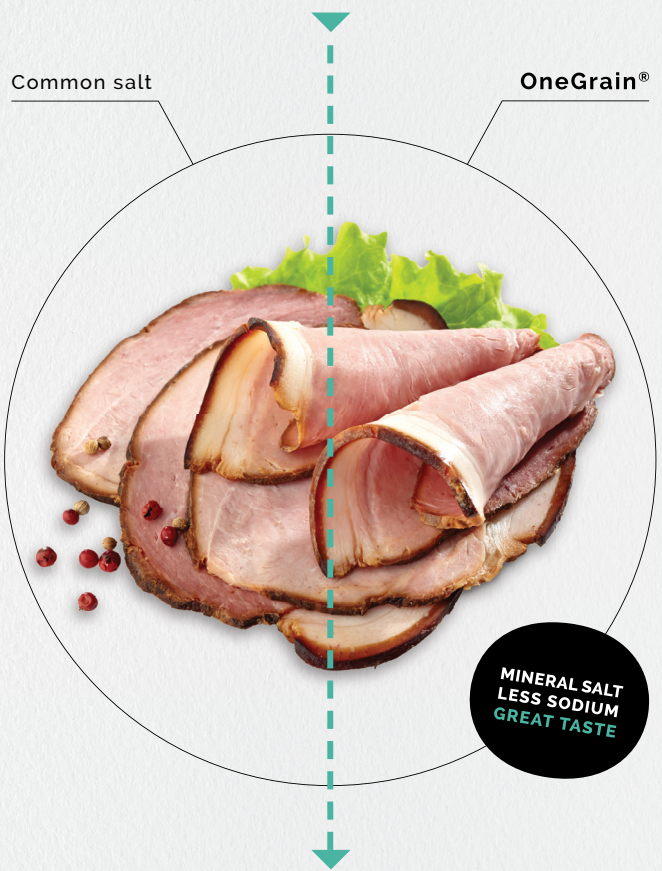
**LEARN MORE AT THE 48TH ANNUAL AIFST CONVENTION**



A/Prof Sally Gras is director of the ARC Dairy Innovation Hub and leads the Hub Microstructure Theme at the University of Melbourne. Hear A/Prof Gras in detail when she presents at the 48th Annual AIFST Convention and 15th Australian Food Microbiology on 11 August 2015.

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# ULTRASOUND MILK FAT SEPARATION TO PRODUCE NOVEL PRODUCTS

*Could new milk fat separation technology open doors for industrial dairy processing?*

**Words by** Pablo Juliano, Thomas Leong, Linda Johansson, Sally McArthur, Raymond Mawson, Aaron Gosling, and Richard Manasseh

Ultrasound processing, or the application of oscillating sound pressure waves produced above the limit of human hearing, has recently drawn great attention in the food industry as a new efficient tool to separate food ingredients.<sup>1</sup> The technique is attractive due to its potential to initiate highly controllable separation of particles while minimally damaging the food's natural properties.

Conventional methods such as centrifugation are often energy intensive, generating large shear forces that may damage sensitive food cells, droplets or particles. Conventional methods may not discriminate between different particle types. The separation technique also has potential to be applied to biomedical particulate fluids such as blood and lipids.

An Australian research team at CSIRO and Swinburne has been the first to demonstrate milk fat separation on a large scale, using an ultrasonic separation technique. A novel, fast and non-destructive separation technique that has typically been used in small-scale settings can now be applied for cream separation from natural whole milk at litre-scales.<sup>2</sup> The volume-scale ultrasound technique has been shown to separate fat globules from milk with high volume throughputs up to 30 litres per hour, opening doors for industrial dairy processing.

By tuning system parameters according to acoustic fundamentals, the technique can be used to specifically select milk fat globules of different sizes

in the collected fractions, achieving fractionation outcomes desired for a particular dairy product.<sup>3</sup> The ultrasonic separation process only takes about 10 to 20 minutes, which is much faster than traditional methods of natural fat sedimentation/buoyancy process of more than six hours, which are still commonly used for the manufacture of Parmesan cheeses in Northern Italy.<sup>4</sup>

## **Ultrasonic separation technique**

When a sound wave is reflected on to itself, the reflected wave can superimpose or lay over the original waves to form what is known as an acoustic standing wave. Such waves are characterised by regions of high local pressure variation, known as pressure antinodes, where constructive superimposition occurs, and regions of minimum local pressure variation where destructive interference occurs, known as pressure nodes.

When an acoustic standing wave field is sustained in liquid containing particles, the wave will be partially scattered by particles and produce what is known as the primary acoustic radiation force. This force acts on the particles, causing them to move towards either the node or antinode of the standing wave, depending on the particles' density. The positioning of individual particles at nodes or antinodes will cause them to aggregate or coalesce rapidly into larger entities.

To date, the ultrasonic separation technique has been mostly applied to small-scale settings such as in

microfluidic devices for biomedical applications. Few demonstrations are on a volume-scale relevant to industrial application, due to the attenuation of acoustic radiation force over large distance.

## **Acoustic separation of milk fat globules**

To extend the ultrasonic technique to large-scale application, the CSIRO and Swinburne team designed a litre-scale system, for proof of concept and to study the operation conditions for rapid separation and fractionation of fat globules from natural whole milk. The key part of the system consisted of a length-tuneable, rectangular reaction vessel that can hold up to two litres of milk and two fully-submersible plate transducers that can generate one or two megahertz ultrasound waves.

To establish the optimal operation conditions, the researchers tested various design parameters such as power input level, process time, temperature, transducer-reflector distance and single or dual transducer set-ups with one transducer facing the other.<sup>4,5</sup> They found the use of dual-plate operation with a transducer-distance of 30mm, could achieve a rapid skimming speed of 1.6 grams of fat per minute. Application of 20-min ultrasound in the system could result in skimmed milk with a fat concentration of 1.7 per cent weight per volume.

The study also showed that ultrasound separation enhances the subdivision between milk fat streams,

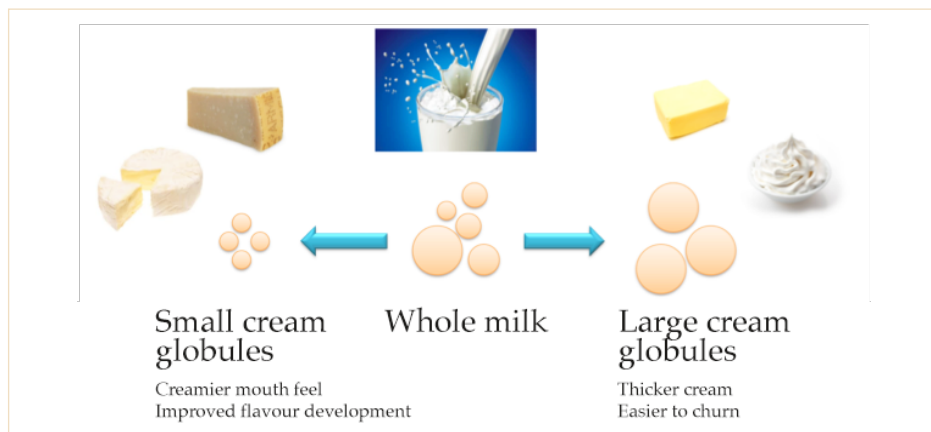


Figure 1. Range of products to be potentially developed with ultrasound fractionated milk fat.

where the top streams of the milk contain more large fat globules (cream) and the bottom streams more small fat globules (skimmed milk), compared to conventional methods.

### Ultrasonic reactor for continuous separation

Lessons learnt from the batch system were implemented into the development of a continuous ultrasonic-assisted separation system, which was shown to split milk into high and low concentration milk fat streams.

These streams can be further fractionated to obtain smaller and larger sized fat globules, which can be used to produce novel dairy products with enhanced properties.<sup>4</sup> Previous studies have suggested that cheeses made from milk with higher portion of small fat globules have superior taste and texture, while milk or cream with more large fat globules can lead to better taste butter.<sup>6,7</sup>

The system's tuneable operation provides high flexibility to tailor milk properties to reach a fat concentration in cream without the need for further

standardisation. It may also provide cream globule size distributions to enrich products with small or large fat globules.

In summary, the ultrasonic separator can now continuously accelerate natural creaming up to 72 times faster, while preserving the natural integrity of cream globules. In contrast to conventional centrifuges, the equipment has no moving parts and small surface area, thereby showing advantages in lower maintenance and cleaning requirements. Although further demonstration is required, the process is amenable for scaling up from a farmhouse (30L per hour) to a boutique factory production (1000L per hour), by combining multiple units. This technology has the potential to create a new range of dairy products that will occupy new market niches and enable dairy processors become more competitive. <sup>Ⓜ</sup>

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*at Swinburne University of Technology. Sally McArthur is Professor of Biomedical Engineering at Swinburne University of Technology. Raymond Mawson is principal research scientist at CSIRO. Aaron Gosling is with the Geoffrey Gardiner Research Foundation. Richard Manasseh is chair of the Department of Mechanical and Product Design Engineering at Swinburne University of Technology.*

### Acknowledgements

This project received financial support by the Australian Research Council and the Geoffrey Gardiner Research Foundation.

### References

1. T. Leong, L. Johansson, P. Juliano, S.L. McArthur, R. Manasseh, (2013). "Ultrasonic separation of particulate fluids in small and large scale systems: a review." *Ind Eng Chem Res*, 52 16555-16576.
2. T. Leong, K. Knoerzer, F.J. Trujillo, L. Johansson, R. Manasseh, P. Juliano, (2015). "Megasonic Separation of Food Droplets and Particles: Design Considerations." *Food Eng Rev*, 1-23.
3. T. Leong, L. Johansson, R. Mawson, S.L. McArthur, R. Manasseh, P. Juliano (2015). "Ultrasonically enhanced fractionation of milk fat in a litre-scale prototype vessel, *Ultrason Sonochem*." In press
4. Leong, T., Johansson, L., Juliano, P., Mawson, R., McArthur, S., Manasseh, R. (2014). "Design parameters for the separation of fat from raw milk in an ultrasonic litre-scale vessel." *Ultrasonics Sonochemistry*. 21(4):1289-98.
5. Leong, T., Juliano, P., Johansson, L., Mawson, R., McArthur, S., Manasseh, R. (2014). "Temperature effects on the ultrasonic separation of fat from natural whole milk." *Ultrasonics Sonochemistry*. 21(6): 2092-2098 2.
6. Logan, A. Day L., Pin, A., Auld, M., Leis, A. Puvanenthiran, A. Augustin, M.A. (2014). "Interactive Effects of Milk Fat Globule and Casein Micelle Size on the Renneting Properties of Milk." *Food and Bioprocess Technology*. 1-11.
7. Michalski, M.-C. Gassi, J.-Y. Famelart, M.-H. Leconte, N. Camier, B. Michel, F. Briard, V. (2003). "The -size of native milk fat globules affects physico-chemical and sensory properties of Camembert cheese." *Le lait*. 83: 131-143.

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# NUTRITION WATCH

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

Words by Dr Ramon Hall

## Eating protein before sleep helps muscle and strength

Researchers from Maastricht University in the Netherlands have investigated the impact of dietary protein supplementation before sleep on muscle mass and strength gains, in conjunction with resistance training (Snijders *et al.*, 2015). The team undertook a parallel design randomised controlled trial involving 44 young men undertaking a 12-week resistance training and supplementation program.

One of the groups received a protein-based supplement each night before sleep. The supplement contained 27.5g protein, 15g carbohydrates and 0.1g fat. The second group received a non-caloric placebo. Muscle growth was measured using whole body dual-energy X-ray absorptiometry and a limb tomography scan. Muscle fibre types were assessed before and after exercise training from muscle biopsies. Muscle strength was measured throughout the experiment using 1-repetition maximum strength assessment.

The results of the study revealed significantly greater increase in muscle strength in the group consuming the protein supplement compared with the placebo ( $+164 \pm 11\text{kg}$  and  $130 \pm 9\text{kg}$  respectively). Additionally, the cross-sectional area of the quadricep muscles also increased to a greater extent in the protein supplemented group, compared with the placebo group ( $+8.4 \pm 1.1\text{cm}^2$  and  $4.8 \pm 4.8\text{cm}^2$  respectively). There was also a significant increase in type II muscle fibres (fast-twitch) in the protein supplementation group ( $+2319 \pm 368\text{mm}^2$ ) compared to the placebo group ( $+1017 \pm 353\text{mm}^2$ ).



The authors concluded that, "Protein ingestion before sleep represents an effective dietary strategy to augment muscle mass and strength gains during resistance exercise training in young men." This study, to some extent, confirms the body builder adage that taking protein overnight will help lead to greater strength and muscle gains. Further studies should be conducted with the same supplement at night and at a different time of the day to confirm how important timing is to these benefits.

The results of this study should inform strength training supplement guidance around timing of supplementation and may lead to the development of specific products for use before sleep.

Snijders *et al.* (2015) "Protein Ingestion before Sleep Increases Muscle Mass and Strength Gains during Prolonged Resistance-Type Exercise Training in Healthy Young Men." *The Journal of Nutrition*, 145, 1178-1184, (10.3945/jn.114.208371).

## Plasma phospholipids influenced by dairy lipids consumption

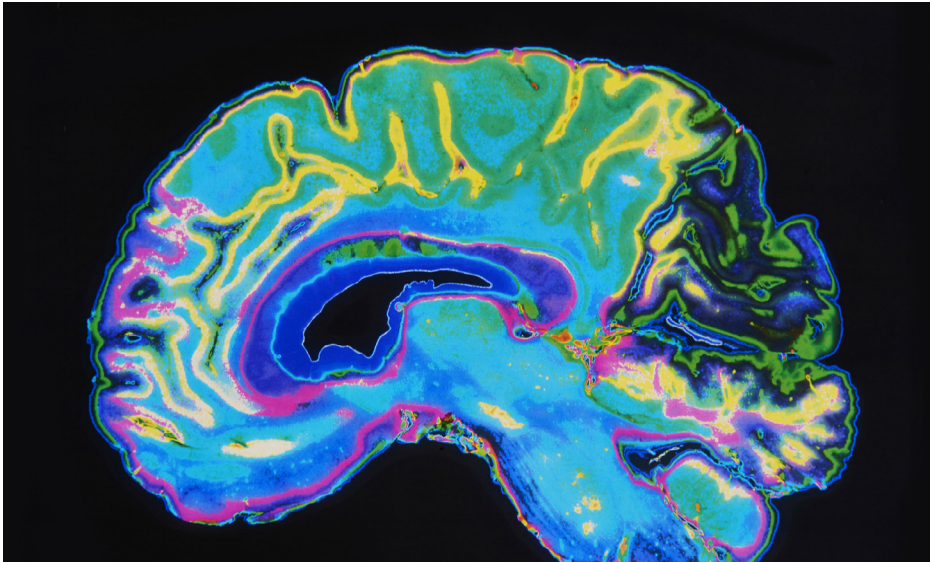
Researchers from Baker IDI Heart and Diabetes Institute and Deakin University in Melbourne have undertaken a study to assess the effect of dairy fat and soy oil on circulating postprandial lipids in men (Meikle *et al.*, 2015). The study was funded by the Dairy Health and Nutrition Consortium. In a randomised controlled crossover design trial, 16 healthy men consumed two breakfast meals on separate occasions containing dairy fats or soy oil.

The meal high in dairy foods (dairy meal) consisted of cheddar cheese (60g), butter (20g), and extra creamy whole milk (300mL), with toast (50g) (3120kJ, 54g fat, 29g protein, and 37g carbohydrate)

The meal high in vegetable oil-based foods (soy meal) contained cheddar-flavoured soy cheese (100g), soy beverage (300mL), a non-dairy spread (20g), and toast (50g) (3290kJ, 54g fat, 29g protein, and 47g carbohydrate). The changes in the plasma lipidome during a 4-h post-meal period were analysed using an electrospray ionisation tandem mass spectrometry that generated 316 lipid species in 23 classes and subclasses, representing sphingolipids, phospholipids, glycerolipids, and sterols.

The results showed significant changes in multiple plasma lipid classes, subclasses and species in the post-meal period after both the dairy and soy meals. Interestingly, there was no difference in the triglyceride response between each meal. However, six endogenous lipid classes increased after the dairy meal but decreased after the soy meal. These lipid classes





included ether linked phospholipids, plasmalogens, sphingomyelin (not present in soy), dihexosylceramide and GM3 ganglioside. Additionally, phosphatidylcholine and phosphatidylinositol were significantly elevated after the dairy meal (16 per cent increase), but were not significantly affected by the soy meal (8.3 per cent increase).

The authors conclude that, “The changes in postprandial plasma phospholipids in men relate to the diet composition and the relative size of the endogenous phospholipid pools. Despite similar lipemic responses as measured by changes in triglyceride concentrations, the differential responses between dairy and soy meals derived through lipidomic analysis of phospholipids, suggest differences in the metabolism of soybean oil and dairy fat. The increased concentrations of plasmalogens, with potential antioxidant capacity, in the postprandial period after dairy, but not soy meals, may represent a further important difference in the response to these sources of fat.”

The current study unravels the complexities of lipid metabolism following the consumption of two sets of foods containing lipids. This clearly demonstrates that the underlying biochemical patterns following each group of foods is markedly different, even though basic measurements of triglycerides are similar. The researchers also add that “despite absence of substantial differences in neutral lipids between dairy- and soy-rich diets, the present study focuses attention on other

important differences in lipid responses which are likely to have biological and possibly clinically relevant effects”, suggesting that some of these differences may be important to health.

This study should be of interest to health practitioners and food manufacturers interested in understanding more detail on the lipidomic pattern following the consumption of complex foods.

Meikle *et al.*, (2015) “Postprandial Plasma Phospholipids in Men Are Influenced by the Source of Dietary Fat.” *The Journal of Nutrition*, published online ahead of print, (doi: 10.3945/jn.115.210104).

### Potential benefits of $\omega$ -3 fatty acids and B vitamin in reducing brain atrophy

A study team led by the Department of Pharmacology, University of Oxford, United Kingdom, have investigated whether plasma  $\omega$ -3 fatty acid concentrations (eicosapentaenoic acid and docosahexaenoic acid) modify the treatment effect of homocysteine-lowering B vitamins on brain atrophy rates in a placebo-controlled trial (Jernerén *et al.*, 2015).

This study was a retrospective analysis, involving 168 elderly individuals ( $\geq 70$  year old), who had mild cognitive impairment. Participants were randomly assigned to placebo ( $n = 83$ ) or a daily high dose of B vitamin supplementation (folic acid, 0.8mg; vitamin B6, 20mg; vitamin B12, 0.5mg) ( $n = 85$ ). All subjects underwent cranial magnetic resonance imaging (MRI) scans at baseline and again two years later. The effect of this intervention was

analysed using the tertiles of baseline plasma  $\omega$ -3 fatty acid concentration.

The results of this study reveal that there was a significant interaction between the B vitamin treatment and the plasma combined  $\omega$ -3 fatty acids levels (eicosapentaenoic acid and docosahexaenoic acid) on the level of brain atrophy rates. In subjects with high baseline  $\omega$ -3 fatty acids levels ( $>590$  mmol/L), B vitamin treatment was shown to slow the mean atrophy rate by 40 per cent compared to placebo. Conversely, in subjects with low baseline  $\omega$ -3 fatty acids levels ( $<390$  mmol/L), B vitamin treatment had no significant effect on the rate of brain atrophy. Additionally, high baseline  $\omega$ -3 fatty acids were associated with a slower rate of brain atrophy in the B vitamin group, although not in the placebo group.

The authors conclude that “The beneficial effect of B vitamin treatment on brain atrophy was observed only in subjects with high plasma  $\omega$ -3 fatty acids. It is also suggested that the beneficial effect of  $\omega$ -3 fatty acids on brain atrophy may be confined to subjects with good B vitamin status”. They also state, “The results highlight the importance of identifying subgroups likely to benefit in clinical trials.”

In a related editorial, Professor Imrich Blasko from the Memory Clinic, Department of Psychiatry and Psychotherapy, Innsbruck Medical University in Austria, indicates that this study is a well-designed nutritional intervention, but indicates there are many questions to answer before these findings could be accepted as mainstream treatment for cognitively impaired elderly.

Professor Blasko suggests the need for further controlled studies clarifying the potential of B vitamins and  $\omega$ -3 fatty acids in persons with an increased risk of developing dementia.

These interesting results could be of importance for the ageing population market, whereby nutritional benefits of B vitamins and  $\omega$ -3 fatty acids may potentially help slow the progression of brain atrophy.

Jernerén *et al.*, (2015) “Brain atrophy in cognitively impaired elderly: the importance of long-chain  $\nu$ -3 fatty acids and B vitamin status in a randomized controlled trial.” *American Journal of Clinical Nutrition*, 102: 215-221, (doi: 10.3945/ajcn.114.103283).



Blasko., (2015) "Interaction of  $\alpha$ -3 fatty acids with B vitamins in slowing the progression of brain atrophy: identifying the elderly at risk." *American Journal of Clinical Nutrition*, 102: 102-107, (doi: 10.3945/ajcn.115.114322).

### Cranberry juice lowers markers of cardiometabolic risk

Researchers from Beltsville Human Nutrition Research Centre, Beltsville, USA, have investigated the potential effect of low-calorie cranberry juice on marker of cardiometabolic risk (Novotny *et al.*, 2015). The researchers conducted a double-blind placebo-controlled parallel design randomised controlled trial, involving 30 women and 26 men. The trial was an eight week intervention involving participants consuming twice daily either a low-calorie cranberry juice (133mg phenolic compounds; 6.5g sugar) or a flavour / colour / energy matched placebo beverage (62mg phenolic compounds; 7.5g sugar). A number of cardiometabolic measurements were undertaken before and after the intervention.

The results reveal fasting serum triglycerides were significantly lower after the low-calorie cranberry juice compared to the placebo group and showed that individuals starting with higher triglyceride level would experience greater reductions. Additionally, serum C-reactive protein (an inflammation biomarker) was significantly lower for the low-calorie cranberry group compared to the placebo group. There were significant reductions in diastolic blood pressure in the low-calorie cranberry group compared to the placebo group. Measurements of fasting blood glucose were also significantly improved in the low-calorie cranberry group compared to the placebo group. In addition, the low-calorie cranberry juice significantly improved the homeostasis assessment of insulin resistance in participants with higher baseline values.

The authors concluded, "Low-calorie cranberry juice can improve several risk factors of cardiovascular

disease in adults, including circulating triglycerides, serum C-reactive protein, and glucose, insulin resistance, and diastolic blood pressure." In addition, they also stated, "Consumption of high-polyphenol products such as cranberry juice is a sustainable lifestyle practice that holds notable promise for improving health."

The authors attributed these cardiometabolic benefits to the polyphenol content of cranberries, indicating that they have among the highest polyphenol concentration compared with other juices. <sup>1</sup>

Novotny *et al.*, (2015) "Cranberry juice consumption lowers markers of cardiometabolic risk, including blood pressure and circulating C-reactive protein, triglyceride, and glucose concentrations in adults". *The Journal of Nutrition*, 145: 1185-93, (doi: 10.3945/jn.114.203190).

*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 Science at Deakin University.*

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# SENSORY AND CONSUMER RESEARCH UPDATE

*What's new? Recent highlights in sensory research.*

Words by Drs Russell Keast, Gie Liem, Megan Thornton and Dieuwerke Bolhuis

## Fancy a glass of sherry?

Researchers in Germany have identified the major aroma components of Amontillado sherry wine, which is aged through both a biological and an oxidative step. The researchers used Sensomics analysis, a molecular sensory approach in which key aroma compounds are differentiated from the bulk of odourless volatiles.

Solvent assisted flavour extraction (SAFE), followed by aroma extract dilution analysis (AEDA), was first performed in order to identify 37 odour-active compounds, with 2-phenylethanol (flowery, honey-like), ethyl methylpropanoate (fruity) and (2S,3S)-2-hydroxy-3-methylpentanoate (also fruity) being those with the highest flavour dilution (FD) factors.

Following this, 36 of the volatiles were quantitated using stable isotope dilution assay (SIDA), in which isotopes of the volatiles are compared to the samples. In identifying the quantity of each volatile, the Odour Activity Value (OAV) of each could be calculated, whereby the concentration of the volatile is divided by the minimum concentration at which the volatile can be detected by the human nose. Those with the highest OAVs were 1,1-diethoxyethane (OAV 2475, fruity), 2- and 3-methylbutanal (OAV 574, malty) and methylpropanal (OAV 369, malty).

Aroma reconstitution experiments were then performed, in which a recombine mixture of the identified volatiles, in the same quantities as identified in the sherry, was created and compared to the overall aroma of



the true sample. Twenty-one panelists assessed the true and recombine aroma solutions, and rated the intensities of different aroma attributes, including ethanol-like, fruity, honey / floral and cooked apple, on a seven-point scale of 0 (very different) to 3 (very similar). Only after some non-volatile constituents were added, including glycerol and glucose, was the recombine solution considered to have an aroma very close to that of the true Amontillado sherry.

Marcq P & Schieberle P (2015). "Characterization of the Key Aroma Compounds in a Commercial Amontillado Sherry Wine by Means of the Sensomics Approach." *J Agric Food Chem* 63: 4761-4770

## The importance of a food label

Consumer intention to purchase depends on the degree to which consumers expect that the product can satisfy their expectations about its use. It is estimated that 73 per cent of purchase decisions are made at the point of sale. Therefore, package becomes a critical factor in the consumer decision-making process because it communicates to consumers at the moment of purchase. How they perceive the subjective entity of products, as presented through communication elements in the package, influences choice, and this is the key to success for many food products marketing strategies.

The authors from Brazil attempted to quantify the effect of each feature of the packaging on consumers' purchase intention, using focus groups followed by a consumer evaluation employing conjoint analysis. The factors defined for the study were brand (well known, lesser known), price (high, low), shape (hourglass, cylindrical), illustration (cup of coffee with foam, steam and coffee beans, cup of coffee) and colour (red, brown).

The total group of 206 coffee consumers completed the study. In general, the inclusion of photos depicting coffee cups' foam, steam and coffee beans, additional information on yield, and the presence of the terms "traditional" and "refill" (for refill packages) on the front panel were desirable characteristics of instant coffee packaging. Additionally, it was observed that consumers' criteria for purchase depended on the material

of the package. For glass packaging, purchase intention depended more on the price and increased with the use of modern shapes, which allowed for better visualisation of the real product. Both brown and red were found to be suitable colours for coffee packages, with consumers preferring brown for glass jars and red for refill packages.

Although the factor of well-known brands was highlighted on the qualitative research, it was not considered the factor of greatest importance on purchase intention for most consumers. This is a positive finding for instant coffee manufacturers of lesser known brands, new brands or brands less associated with their products, as improving other attributes of their packages may encourage product sales.

In terms of practical implications, the authors state that brand was less important than price and packaging attributes, such as additional information, adequate illustration (for refill packs) and package shape (for glass jars). Therefore, these results should hopefully help coffee manufacturers develop their packages and improve their sales, mainly those of lesser known brands, new brands or brands less associated with instant coffee.

Kobyashi *et al.*, (2015) "Impact of Packaging Characteristics on Consumer Purchase Intention: Instant Coffee in Refill Packs and Glass Jars." *Journal of Sensory Studies* DOI: 10.1111/joss.12142

### Plating for pleasure

With MasterChef in its seventh season, the dedicated home cook is probably paying a little bit more attention to plating. When judges use phrases like "that looks really inviting", "pleasing to the eye" or "wow, I would be happy to have that served in a restaurant", we may think that it is all about the opinion of the experts. However, there is actually something that is called 'the science of food plating'.

Several studies have shown that the way the foods looks, how the items are arranged on a plate, as well as the plate you use, can increase the appetitive look of your food. This is all nice, but as a busy individual, many of



us have little time to spend on figuring out how to be a plating specialist. Luckily, new research published in the journal, *Food Quality and Preference*, suggests that good plating might be as simple as just turning around your plate. In a massive online study with 12,000 participants, the researchers concluded that simply rotating your plate can increase consumers' positive perception of the food and, more importantly, consumers' willingness to pay more for the food.

In this experiment, participants were shown a signature dish of the upcoming Brazilian chef Alberto Landgraf (who is also a co-author on the paper). This dish exists of three little pickled onions arranged in a triangular shape. Each onion, which has a triangular shape of its own, points into the same direction.

Inspired by Japanese customs, where it is rude to point things to customers, chef Landgraf intuitively always served the dish with the three onions pointing away from the dining guest. By using an online testing system, participants were shown four photos of the pickled onion dish, with the orientation of the onion being the only difference. The task was simple – rank these photos from most to least preferred and type in the amount of money you would be willing to pay for the 'different' dishes.

In an additional experiment,

participants could rotate the plate themselves, which caused the onions to point in a different direction depending on how much the plate was rotated. Participants were asked to stop rotating the plate when they thought the plate looked the most appealing.

The results showed that participants were more willing to pay for the dish when the food items pointed away from them. More specifically, the most preferred dish was when the food items pointed 3.2 degrees clockwise.

So, next time you want your food to look more amazing, just turn the plate around. Warning, it probably does not work when your serve soup in a bowl.

Michel C *et al.*, "Rotating plates: Online study demonstrates the importance of orientation in the plating of food." *Food Quality and Preference* 44 (2015) 194-202

### Are ready-meals really unhealthy?

Ready-meals are primarily seen as a convenient alternative to home cooking. These pre-prepared main courses can be reheated in their container, requiring no further ingredients and needing only minimal preparation before consumption.

Ready-meals tend to contain high amounts of fat and their consumption has been associated with higher body weight. In 2006, it was estimated that 40 per cent of UK households ate such

meals at least once a week, indicating a substantial impact for public health.

Researchers from the Newcastle University in the UK have described the nutritional content of supermarket ready-meals. They included 166 ready-meals from 41 supermarkets within a city in Northern England. Nutrient content varied substantially between meals. In general, the meals were rated as medium for fat, high for saturated fat and salt, and low for sugar. The meals were divided in four ranges, 'luxury', 'healthy', 'standard' and 'value', based on explicit branding on packages.


Meals in the luxury ranges were rated high for fat, saturated fat and salt, and low for sugar. Meals in the 'healthier' ranges were low for fat, saturated fat and sugar, and medium for salt. This suggests that healthier alternatives (~25 per cent of the available ready-meals) are available within the ready-meal sector and a simple public health message to avoid all ready-meals may be inappropriate.

The researchers also explored the associations between cost and nutritional content. The costs of meals were positively associated with weight, total energy, fat, saturated fat, protein and fibre. This means that



consumers do not necessarily have to pay more for healthier meals.

Taken together, this study illustrates that it is clearly possible to produce healthier ready-meals. The authors argue that more effort is required to encourage the food industry to improve the nutritional profile of the full range of ready-meals, and not just those labelled as 'healthy'.

Remnant J., Adams J. (2015) "The nutritional content and cost of supermarket ready-meals. Cross-sectional analysis." *Appetite* 92: 36-42. 

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## WINE WASTE INTO PROFITS? GRAPE NEWS

*Researchers are looking into ways to turn Australia's love of wine into a profit while reducing food waste. Wine not?*

Forget turning water into wine, let's make wine waste into profits. The latest research out of the University of Adelaide is looking to turn waste leftover from the winemaking process into a sustainable industry for winemakers and the beverage industry alike.

The research will explore ways to improve the processing of grape marc – the solid waste that remains after juice is crushed out of grapes – for increased alcohol production and use in spirits such as brandy or fortified wines.

Dr Ravichandra Potumarthi from the University of Sydney's Australian Research Council Training Centre for Innovative Wine Production said the amount of grape marc produced, which includes stalks, skins and seeds, is estimated to be several hundred thousand tonnes.

"It's around 15 to 30 per cent of the weight of the grapes used for wine making. Disposal poses a real problem for the industry," said Dr Potumarthi.

"Grape marc can be used to generate revenue from recovered alcohol through further processing of the waste and distillation. Current process methods need to be more efficient for widespread adoption by the industry.

"Our research is aimed at developing sustainable technology and processes that will help the wine industry generate more revenue and make better use of this by-

product," Dr Potumarthi said. "If we can enhance processing efficiencies for alcohol production, producers will be able to generate more revenue from the same amount of grapes, converting a waste stream into a valued product.

"In this way, the wine industry will be able to address environmental concerns of waste disposal and make their industry more sustainable."

With a reported earnings drop of 15 per cent for grape growers compared to last year, people are starting to get inventive with how they can maximise profit from all aspects of the grape.


Additionally, the Australian Wine Research Institute (AWRI) is undertaking trials with livestock to determine the potential of grape marc in reducing methane levels amongst 36 Angus beef cattle.

The full-scale feeding trial is being run in collaboration with the University of New England and Tarac Technologies and will see the cattle much through 30 tonnes of grape marc to determine if methane levels decrease.

It isn't only Australia that is looking to reap the benefits from all aspects of the grape, with researchers in the United States exploring the idea of flour that has been ground from grapes.

The United States Department of Agriculture's Healthy Processed Foods Research Unit is exploring a new innovation that will see flour that is made from grape waste left from the crushing process.

The flour has resulted in a healthy, gluten-free alternative to wheat flour that can provide a number of health benefits due to the high levels of fibre and polyphenols which US researchers are exploring its potential in decreasing cholesterol and weight-gain.

A chocolate-chip cookie infused with pinot noir doesn't sound too bad at all. 





DIARY

## AUSTRALIA & NEW ZEALAND 2015

**September 9-11** Australasian section of the American Oil Society Biennial Meeting. The Pier, Geelong, Victoria. [www.aaocs2015.wordpress.com](http://www.aaocs2015.wordpress.com)

**September 12-13** Real Food Festival. Maleny Showgrounds, Sunshine Coast, Queensland. [www.realfoodfestivals.com.au](http://www.realfoodfestivals.com.au)

**September 20-23** Fine Food Australia. Sydney Showground, Sydney Olympic Park, Sydney, NSW. [finefoodaustralia.com.au](http://finefoodaustralia.com.au)

**October 12-14** Institute of Hospitality in HealthCare National Conference. Hilton Hotel, Brisbane, Queensland. [www.ihhc.org.au](http://www.ihhc.org.au)

**October 28-30** 3rd International Conference on Food Structures, Digestion and Health. Intercontinental Wellington, Wellington, New Zealand. [www.fsdh2015.org](http://www.fsdh2015.org)

**November 4-5** Australian Agriculture Roundtable Conference. Hilton Hotel, Sydney, NSW. [www.farminstitute.org.au](http://www.farminstitute.org.au)

**November 16-18** Tropical Agriculture Conference 2015. Brisbane Convention & Exhibition Centre, Brisbane, Queensland. [www.tropagconference.com.au](http://www.tropagconference.com.au)

## INTERNATIONAL 2015

**September 2-3** Vitafoods Asia. Asia World Expo, Hong Kong. [www.vitafoodsasia.com](http://www.vitafoodsasia.com)

**September 11-15** drinktec 2015. New Munich Trade Fair Centre, Munich, Germany. [www.drinktec.com](http://www.drinktec.com)

**September 20-24** IDF World Dairy Summit. Vilnius, Lithuania. [www.idfwds2015.com](http://www.idfwds2015.com)

**September 27-30** 13th Euro Fed Lipid Congress. Florence, Italy. [www.eurofedlipid.org](http://www.eurofedlipid.org)

**October 11-14** 2nd International Conference on Global Food Security. Cornell University, Ithaca, New York, USA. [www.globalfoodsecurityconference.com](http://www.globalfoodsecurityconference.com)

**October 18-21** AACCI (American Association of Cereal Chemists International) 2015 Centennial Meeting. Minneapolis, Minnesota, USA. [www.aaccnet.org](http://www.aaccnet.org)

**October 27-29** Sweets & Snacks Middle East. Dubai Convention and Exhibition Centre, Dubai, UAE. [www.sweetsmiddleeast.com](http://www.sweetsmiddleeast.com)

# inSight

A point of difference in today's busy FMCG market.

Developed by AsureQuality, inSight™ provides shoppers with independently verified information about the products they are about to buy.

After a successful application process, producers can place the inSight™ logo and a QR code on their product packaging.

When shoppers scan the QR code at the point of sale they can access information about the product, including:

- Environmental sustainability
- Social and ethical concerns
- Nutritional information
- Safety and quality
- Origin



A new innovation taking product assurances into the 21st Century

Call us now on 1800 247 478 to find out how inSight™ can add value to your business.

[www.aqinsight.com](http://www.aqinsight.com)



# How do you know

whether equipment, materials and services are suitable for use in food processing and handling?

Only one mark truly confirms a non-ingredient product is food-safe. If it's not food-safe in every respect, it can't carry this mark – simple.

The HACCP Australia certification mark is aligned with the due diligence requirements of the world's leading food safety standards and quality systems. Ten key criteria are examined to give you that full assurance. Certified products need to satisfy ALL criteria – not just individual components. It's either completely fit for its purpose or it's not!



**No ifs, no buts, it is or it isn't!**

That's why products from these well respected manufacturers and many more carry the mark.



**HACCP AUSTRALIA**  
eliminate the hazard - reduce the risk

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