

# food

Official publication of AIFST LTD

# australia

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FEBRUARY/MARCH 2015

## **YEAST EXTRACTS** take centre stage as a sodium replacer



 **Angel**  
Healthy Life Innovator

 **RejuvaCare**  
International Pty Ltd

*Also Inside*

**NATIONAL FOOD INCIDENT RESPONSE  
PREPARING FOR A FRESH PRODUCE FOOD SAFETY CRISIS  
INGREDIENTS MOVING BEYOND TRADITIONAL OFFERINGS**

# ON THE COVER

## Function of Yeast Extracts



### Product Range

- Basic YE (KA series, LA series)
- Strong umami taste YE (FIG series, KU series, LIG series)
- Strong kokumi taste YE (KK series, LK series)
- Flavour YE
  - Soy sauce flavour
  - Meat flavour (with or without animal origin)
  - Cheese flavour
  - Vegetable flavour

### UMAMI enhancer

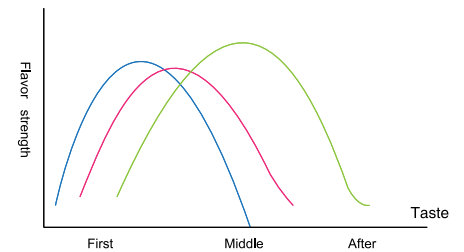
YE itself is rich in various amino acids and nucleotides. It is a natural flavour product integrating three kinds of flavour substances: glutamic acid, IMP and GMP into one. So YE have good umami enhancing character.

### KOKUMI enhancer

YE is rich in "Delicious Peptide" Lys-Gly-Asp-Glu-Ser-Leu\_Ala (beefy meaty flavour), and the small peptides such as Glu-Glu, Ser-Glu\_Glu, Glu-Ser, Thr-Glu, Glu-Asp, Asp-Glu-Ser etc. which could present delicious flavour, and flavour enhancing peptides such as Gly-Leu, Pro-Glu and Val-Glu etc... All these peptides could well enhance foods' KOKUMI taste which is unmatched by MSG and I+G.

### Flavouring features

YE itself has strong umami flavour and it can also interact with other flavour substances, to make the final taste more robust, mellow and full, achieving the best rounded taste.

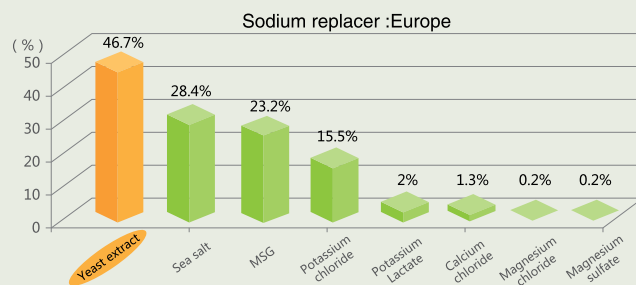


### Sodium reduction

Studies have found that YE could increase not only the receptive function of umami receptor in human gustatory sense, but also the salinity effect of sodium. Therefore, although the content of sodium chloride has been reduced, the human sense to delicate flavour isn't sacrificed; that is, food with the addition of YE could also meet people's requirements of deliciousness of food in the case of low salt.

Application studies showed that appropriate addition of YE could reduce the amount of salt to 35 per cent in food, and the umami and delicious taste could be effectively guaranteed.

In European countries, yeast extract takes centre stage as a sodium replacer in soups, sauces, seasonings, instant foods and foods for baby. Yeast extract, sodium is replaced by one of Europe's most spotlighted material. <sup>A</sup>



Substitution of sodium into the European(2008-2010), Source: innova database) / Source: Health industry Development institute



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## FROM THE AIFST BOARD

Happy new year and welcome to the February / March 2015 issue of *food australia*.

The board and national office of AIFST is very excited about what 2015 will bring for the Institute as we work together to implement the new vision signed off by the membership at the Extraordinary General Meeting (EGM) in October last year. See the latest news from the team in the AIFST section on pages 6-13 of the journal.

Also in this issue, we have a range of interesting contributions and features to keep you up to date with the latest happenings in the food industry both locally and globally.

On page 28, FSANZ experts Amanda Hill and Peter Day review the National Food Incident Response Protocol, which provides guidance on response to national food incidents. We then take a closer look at food safety in horticulture with Richard Bennett on page 24.

Food safety incidents are a significant threat to reputation, and on page 31, Deloitte Australia's Liz Brown outlines the findings from Deloitte's latest survey, which suggests that reputational risk is the number one concern of business executives globally.

This issue also provides plenty of science updates, from the latest in ingredients research on page 20, nutrition on page 40 and sensory and consumer research on page 43.

Finally, we have a business development feature from Oliver Wight's Andy Walker and David Holmes which challenges traditional models of demand planning for businesses and emphasises the importance of incorporating the power of insight with any statistical modelling tool.

I do hope you enjoy this issue of *food australia*.

**Dr Anne Astin**

AIFST Board Chair





BY THE NUMBERS

# ORGANIC INDUSTRY GROWTH

In the recent release from the biennial *Australian Organic Market Report*, figures show a promising outlook for the organic industry.

Over the past three years, the consumption of certified organic products and household products has grown significantly and in some cases demand for organic products has even outstripped supply.

According to the report, the Australian organic retail market is expected to continue its strong growth path with private label products, certified organic processed foods and greater affordability driving the industry's trajectory.

The organic dairy and beef markets experienced particular growth.

Alister Ferguson, chief executive officer of Arcadian Organic & Natural Meat Co, said the demand has been so considerable that demand for organic beef is now equal to demand for natural meat products.

"At the moment we're trading equal amounts of organic and natural meat products," said Ferguson.

"There is a solid future in organic meat farming and even if we doubled supply, the consumer demand would continue to grow."

The key reasons for choosing organic foods were primarily health focused, with emphasis on chemical hormone and antibiotic-free products, as well as environmental reasons.

Here are some key numbers from the *Australian Organic Market Report*.



The food industry as a whole accounts for over a quarter (28.9%) of Australia's total manufacturing industry.

The value of organic farm-gate production.



The current value of the organic grape industry.



Current value of the organic coffee industry.

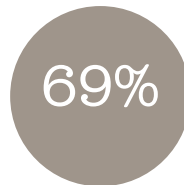


Organic exports have doubled since 2011.

The compounded growth of the beef industry in the past three years.



The estimated current value of the organic dairy industry, Australia's fastest growing organic industry.



of primary grocery buyers say they have bought an organic product in the past 12 months.



The number of shoppers who would only buy an organic product if it says, 'certified organic'.



86.8% of all fresh produce grown in Australia went to the Australian domestic market.

Wine grape production increased by 120% in the past three years.



The value of the beef industry, Australia's second fastest growing organic industry.



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## CANBERRA UNVEILS FOOD AND AGRICULTURE PRECINCT

A new \$200 million state-of-the-art food and agriculture precinct will see some of Australia's best agricultural, science and environmental researchers join forces.

The National Agricultural and Environmental Sciences Precinct (NAESP) at the CSIRO's Black Mountain in Canberra site will see top researchers from the CSIRO and Australian National University (ANU) collaborate to help build a sustainable future for the environment, agriculture industry and global food supplies.

The Science and Industry Endowment Fund (SIEF), which provides grants to assist with scientific research and development in Australia will also contribute \$18 million in funding.

CSIRO board chair Simon McKeon said the new precinct will bring together some of the best skill and know-how to transform scientific research.

"The new precinct brings together the world-class blue-sky research at ANU with the research, practical skills and industrial know-how of CSIRO to transform agriculture," said McKeon.

As part of the NAESP, ANU and CSIRO will set up a new Centre for Genomics, Metabolomics and Bioinformatics, to underpin research projects in transformational agriculture.



*Minister for Industry and Science, Ian Macfarlane officially opened the precinct. Image courtesy of Minister's office.*

ANU Vice-Chancellor Professor Ian Young agrees the new precinct is a win for research and development.

"The collaboration will transform the way agricultural and environmental research and innovation is conducted in Australia. NAESP will become a one-stop shop for integrated plant breeding and natural resource management, which will also create opportunities for new biologically-based industries."

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## NEW TRAINING CENTRE FOR SYDNEY AND NEWCASTLE UNIS

The University of Sydney and University of Newcastle have joined forces to establish a food and beverage supply chain training centre that will be used to train PhD students in Sydney and Newcastle.

The ARC Centre for Food and Beverage Supply Chain Optimisation will provide state-of-the-art training for the future of food technology and production specialists.

"The centre will be used to train the next generation of researchers capable of designing and managing safe, sustainable, and cost-effective food supply chains vital to the industry's future," said centre chief investigator, Associate Professor Behnam Fahimnia.

The food industry in its entirety employs 1.64 million Australians. Around 15 per cent of total national employment and investment in the training and education will provide opportunities for future growth and development.



The centre has the backing of the CSIRO and NSW Department of Primary Industries as well as major food and beverage brands including Coca-Cola Amatil, Sanitarium Health and Wellbeing, SunRice and the Batlow Fruit Co-operative.



## DIRECT PRINT LABELLING THE WAY OF THE FUTURE

Paper labels on PET bottles could be a thing of the past in Australian packaging, thanks to new technology designed by German packaging company KHS GmbH.

The award-winning prototype labelling system allows high-resolution colour labels to be printed directly onto the PET bottles using a quick-dry, smudge-proof and ultra-adhesive UV ink that eliminates the need to print onto a label.

The ink is available in CMYK colours, white and specialty colours to allow the labels to have the same vibrant colour as paper labels when printed directly on to the plastic bottles.

To produce the labels, tiny adhesive dots that bond together are printed directly onto the bottle where they join together to form a solid colour.

The ink does not affect the recyclability of the product and can be produced in a shorter timeframe than traditional labels, reducing the time to market interval and cutting costs.

Prof. Dr.-Ing. Matthias Niemeyer, chief executive officer of KHS GmbH, said the new printing system could revolutionise the labelling process.

“We’ve taken new paths with Direct Print and Nature MultiPack™, giving our customers the chance to be innovative leaders in their markets,” said Professor Niemeyer.

# inSight

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- Origin



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## REPORT OUTLINES HEALTH TRENDS FOR 2015

A new report entitled *10 Key Trends in Food, Nutrition & Health in 2015* has predicted that this year will see small entrepreneurial brands thrive while mainstream health brands struggle.

The food and health trends forecast, developed by New Nutrition Business, said the weight wellness market has reached a tipping point that will see sales fall for big brands as consumers look to natural and unprocessed foods, giving entrepreneurial-minded small business owners the opportunity to capitalise on this new market.

Author of the report, Julian Mellentin, said a desire to lose weight is the key driver behind dietary changes in 2015.

“People’s desire to maintain a healthy weight and a trim figure is the biggest influence on the key trends in food and health, driving many of the trends in this report,” he said

“Improving digestive health and avoiding a bloated stomach to maintain a good figure are key reasons why people adopt, for example, a gluten-free or lower-gluten diet, avoid refined carbs and try to consume more good grains.”

Changing perceptions of fat, carbohydrates and sugar had the largest influence on the trends outlined in the report.

The report details the growing demonisation of sugar that has resulted in many people adopting sugar free diets or shun foods that contain added sugar and the increasing trend to label carbohydrates as ‘good’ or ‘bad’.

Health-conscious consumers also appear to be embracing trends of adopting a low-carbohydrate diet in favour of high fat diets as perceptions of both fat and reduced fat products change.

In addition there is also a trend to consume foods that are considered naturally functional. Key examples include Greek yoghurt, coconut water and almonds.

Innova Market Insights examined this trend and found that in 2014, coconut featured in six per cent of global juice launches, a 4.5 per cent increase from the year prior.

The report also explains dairy is emerging as a big winner of changing perceptions of fat and its image is getting a boost as science both refutes negatives around dairy fats and uncovers more about the positive effects of dairy consumption.

Unsurprisingly there is also a growing trend to follow a gluten-free diet with many mainstream products now introducing gluten-free alternatives.





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## AFGC WELCOMES KOREA-AUSTRALIA FREE TRADE AGREEMENT

Chief executive officer of the Australian Food & Grocery Council (AFGC), Gary Dawson, said Australian food and beverage exporters will begin to benefit from the tariff cuts in 2015 now that the free trade agreement with South Korea has officially commenced.

The Korea-Australia Free Trade Agreement (KAFTA) was signed in April 2014 and came into effect late last year.

“The successive tariff reductions will allow Australian agri-food exporters to better compete with products from the USA, Canada and Europe in the Korean marketplace,” said Dawson.

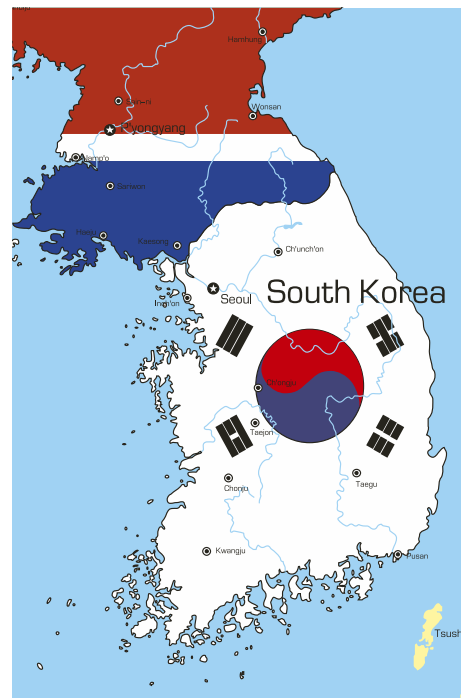
“KAFTA will be the first agreement implemented following the conclusion of Australia’s trade negotiations with Korea, Japan and China. Each

agreement is a critical opportunity to revive Australia’s food exports and once fully implemented, the three agreements will provide Australian exporters a range of opportunities in some of the largest markets in Asia.”

The agreement will see the elimination of tariffs on exports including beef, wine, raw sugar and a wide range of horticultural, packaged and processed foods.

Australian dairy exporters will also benefit from growing duty-free quotas for cheese, butter and infant formula and the tariffs on butter and cheese will be eliminated over the next 13 to 20 years.

Korea is Australia’s fourth largest trading partner with bilateral trade worth \$34 billion a year.



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## VICTORIA LAUNCHES TOUGH NEW RESTRICTIONS FOR UNPASTEURISED MILK SALES



The Victorian Government has announced new regulations to ensure unpasteurised bath milk is safer for consumers.

Victorian Minister for Consumer Affairs, Jane Garrett, said the Government will introduce tougher licensing conditions for dairy farmers and manufacturers that will see farmers who breach restrictions risk having their licence to produce dairy products cancelled.

Under the new conditions ‘bath’ milk producers must either treat the product to reduce pathogens or make the milk unpalatable through methods such as adding bittering agents to the milk.

Garrett explained that while the raw milk does have legitimate uses, there are serious health risks from consuming the milk and it is not safe to drink.

“Despite the labelling of raw milk as not fit for human consumption, some Victorians have been put at risk from drinking it,” said Garrett.

“Raw milk has legitimate uses, but is not safe to drink. We are going to better regulate the industry to protect consumers.

“These new conditions will help protect Victorians from the serious risks of drinking raw unpasteurised milk.”

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## PROBIOTICS MAY OFFER KEY TO PEANUT ALLERGIES

Researchers from Murdoch Childrens Research Institute have successfully trialled a treatment for peanut allergies that could potentially provide a long-term cure for allergy sufferers.

Over 60 peanut allergic children in the study were either given a dose of a probiotic, *Lactobacillus rhamnosus*, together with peanut protein in increasing amounts, or a placebo over 18 months to assess whether children would become tolerant to peanut.

The probiotic was a fixed daily dose, while the peanut oral immunotherapy was a daily dose of peanut protein starting at very low doses followed by a dose increase every two weeks until the maintenance dose (2 grams peanut protein) was reached. At the end of the treatment, the child's ability to tolerate peanut was assessed by a peanut challenge performed two to five weeks after stopping treatment.

The researchers found over 80 per cent of children who received the oral immunotherapy treatment were able to tolerate peanut at the end of the trial, compared to less than 4 per cent of the placebo group. This is 20 times higher than the natural rate of resolution for peanut allergy.

At the end of the trial, 23 of 28 (82.1 per cent) probiotic treated children and one of 28 (3.6 per cent) placebo-treated children were able to include peanut in their diet. The

likelihood of success was high – if nine children were given probiotic and peanut therapy, seven would benefit.

Lead researcher, Associate Professor Mimi Tang said the study results are extremely exciting as they could potentially provide an effective treatment for food allergy.

“In the study, the combined delivery of probiotic and oral immunotherapy was a safe and effective treatment for peanut allergy. However, it is important to point out that this treatment must be only given under close medical supervision as we are giving peanut to children who are allergic to peanut, and children did have allergic reactions. Nevertheless, the likelihood of success was high – if nine children were given probiotic and peanut therapy, seven would benefit.

“It appears that we have been able to modify the allergic response to peanut such that the immune system produces protective responses rather than a harmful response to the peanut protein,” said A/Prof Tang.

The need for a curative treatment is greatest for peanut allergy since this is usually lifelong, and is the most common cause of fatality due to food-induced anaphylaxis.

Further research is now required to confirm whether patients can still tolerate peanut years after the study has finished.



# FAST TESTING FOR UHT DAIRY

The global market for Ultra High Temperature (UHT) processed dairy is set to grow at 12.8 per cent a year to reach \$138 billion by 2019.<sup>1</sup> This is good news for Australia – there is a growing domestic market as well as significant growth in Asia. And while Australian manufacturers can meet some of this demand, it means companies now need systems that improve their responsiveness.

The **3M™ Microbial Luminescence System II (MLS II)** uses bioluminescence technology to detect the presence of microbial contamination in finished UHT process dairy and related products, which helps companies be more responsive to customer needs by delivering faster results – freeing up inventory and saving money.

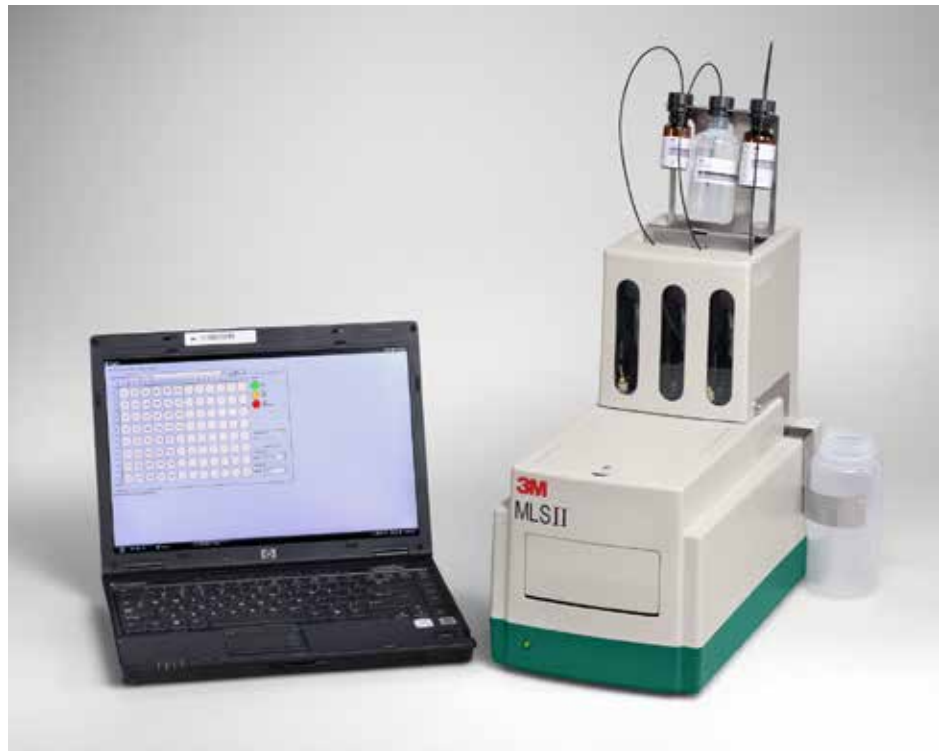
## **Bioluminescence technology**

Bioluminescence to measure the presence of adenosine triphosphate has its origins in work done by NASA as a means to detect the presence of life on other planets. This science offers the food industry a fast, simple and reliable way to test for the presence of biological contamination.

According to 3M's sales and marketing manager Samantha Gaunt, this technology has revolutionised food safety. "Pathogens are a real threat to public health and to our customers' businesses. Global regulations are changing and microbiology labs face considerable challenges, including pressure to deliver more rapid results," she said.

## **Faster turns on inventory**

Where traditional methods of testing require waiting several days for microbes to grow, the **3M™ MLSII** system delivers results in less than an hour. This enables product to be released in less working days, which means ongoing cost savings by freeing



up storage space and reducing the amount of finished goods inventory.

By saving time in the testing process, the **3M™ MLSII** saves businesses money through better productivity, less storage space and cost. Reduced inventory hold times also mean improved cash flow.

## **Two easy steps**

Following product incubation, the system tests finished UHT dairy and related products using two simple steps.

1. Use the pipette to place a 50ul sample into each well.
2. Place the microplate into the **3M™ MLSII** and select UHT assay

The system then delivers a pass, fail or caution result.

"The **3M™ MLSII** system offers both specificity and sensitivity. It is easy-to-implement, low maintenance, reliable and accurate," said Gaunt.

*3M is a leader in innovative solutions that help the food and beverage industries optimise the quality and safety of its products to enable consumer protection. At every step, 3M Food Safety provides solutions that help mitigate risk, improve operational efficiencies and impact the bottom line.*

For more on the **3M™ Microbial Luminescence System II (MLS II)**, visit [www.3M.com.au/foodsafety](http://www.3M.com.au/foodsafety) or follow @3MNews on Twitter.

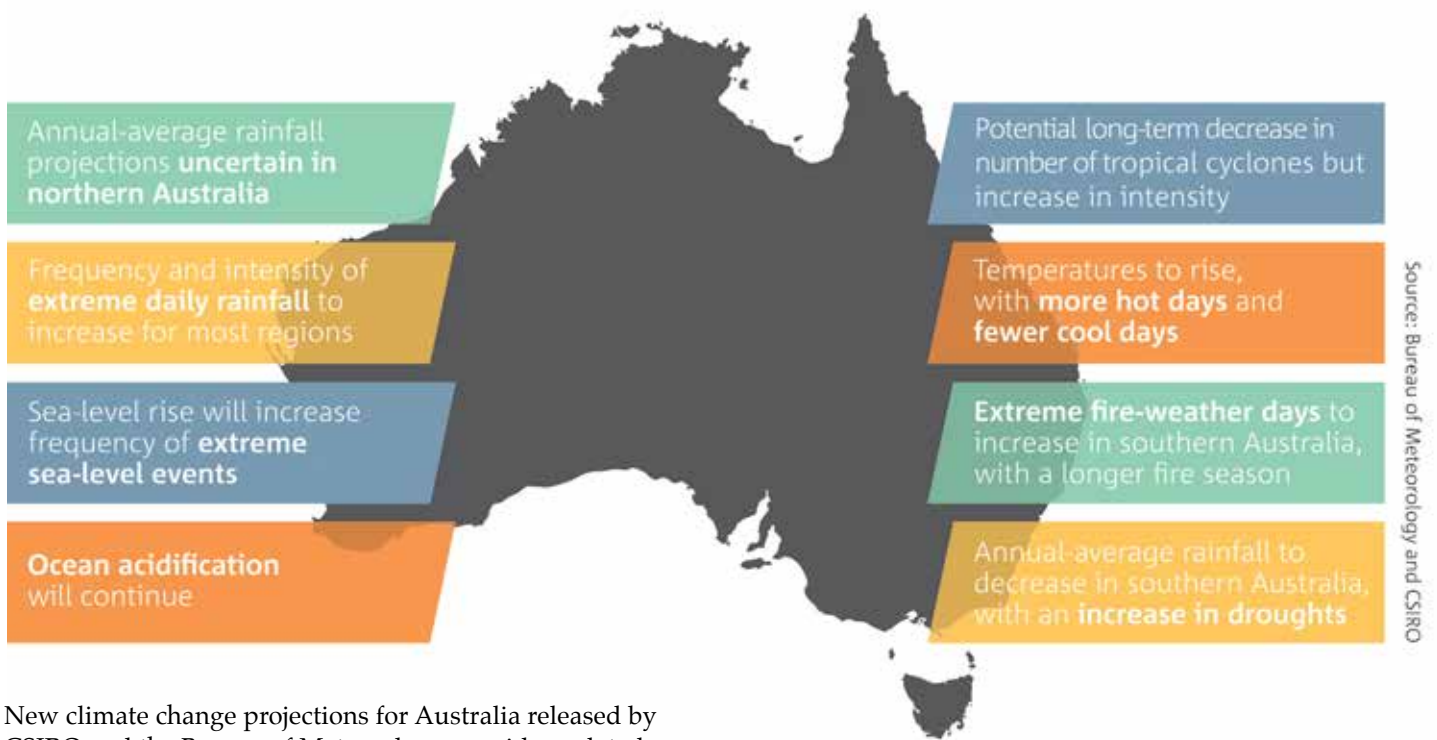
## **Reference**

1. Transparency Marketing Research (2014). UHT Milk Market - Global Industry Analysis, Size, Share, Growth, Trends and Forecast 2013 – 2019.





# NEW CLIMATE CHANGE PROJECTIONS FOR AUSTRALIA



New climate change projections for Australia released by CSIRO and the Bureau of Meteorology provide updated national and regional information on how the climate may change to the end of the 21st century.

The projections have been prepared to inform impact assessment and planning in the natural resource management sector, with information drawn from simulations based on up to 40 global climate models.

The researchers have confirmed that most of the changes observed over recent decades will continue into the future.

“There is very high confidence that hot days will become more frequent and hotter,” said CSIRO principal research scientist Kevin Hennessy. “We also have very high confidence that sea levels will rise, oceans will become more acidic, and snow depths will decline.

“We expect that extreme rainfall events across the nation are likely to become more intense, even where annual average rainfall is projected to decline.”

In southern mainland Australia, winter and spring rainfall is projected to decrease, but increases are projected for Tasmania in winter.

For the rest of Australia, naturally occurring fluctuations in rainfall patterns will dominate over trends due to climate change until 2030, after which the trends associated with climate change will begin to emerge.

Southern and eastern Australia are projected to experience harsher fire weather, while tropical cyclones may occur less often, but become more intense.

Commenting on the implications for Australian agriculture and the food supply, Dr Mark Howden, from CSIRO’s Agriculture Flagship, said the projections will have impacts for both the supply and quality of food.

“The projected reductions in rainfall and increased temperature in key productive agricultural regions may result in a significant reduction in average crop yields and livestock production,” he said.

“Importantly, variability in production is likely to increase due to both more intense and frequent droughts and floods, due in part to the intensification of both El Niño and La Niña systems.

“The projected increase in intense rainfall will also increase the risk of soil erosion. Food quality may be negatively impacted by the higher extreme temperatures projected and the occurrence of many food-borne diseases is also likely to increase with higher temperatures.”

The climate-change reports can be downloaded from [www.climatechangeinaustralia.gov.au](http://www.climatechangeinaustralia.gov.au).

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## FODMAPS COULD TAKE THE 'I' OUT OF IBS

A research team from the University of Copenhagen in Denmark has found that a low FODMAP diet and probiotic supplements can help reduce the effects of irritable bowel syndrome (IBS).

In one of the first studies to investigate the link between IBS and digestive habits, researchers found that people with IBS reported significant improvements in their symptoms and overall wellbeing on a low FODMAP diet or while taking probiotics containing the strain, *Lactobacillus rhamnosus*.

While good news for some, the results suggest that improvements in symptoms are largely dependent on the particular type of IBS people have, with participants suffering from diarrhoea and alternating bowel movements more likely to have improved symptoms than participants suffering from constipation.

Researchers say that while different diets to treat IBS are already out there, a better understanding of the effects of a low FODMAP diet or probiotic supplements in European populations is beneficial not only for IBS sufferers but to ease pressure on domestic healthcare systems.


It is the first study of this kind to be conducted on a European population, with previous FODMAP data being collected from Australian and New Zealand samples. Over a six-week period, researchers tested 123 people with IBS, having divided

them at random into three test groups – those who would follow a low FODMAP diet, those who would take two LGG capsules (probiotics) a day, and those who would remain on an unchanged Danish or western diet.

Participants were allowed to continue their existing IBS medication, and in order to track the effectiveness of their diets were required to register their symptoms each week using an online portal with an IBS severity scoring system to measure physical symptoms, and an IBS specific quality of life questionnaire to measure overall wellbeing.

While there was a significant reduction in IBS severity scores in all patients from the beginning of the study until week six, at week six when comparing mean IBS severity scores, a statistically significant reduction in severity scores was observed in those on the low FODMAP diet or probiotics compared to the group who remained on a normal diet.

Researchers also noted that the simple act of entering daily symptoms into the online portal may have also contributed to participants' perceived improvements thanks to increased education and awareness of their condition.

To learn more about the study, visit [www.ncbi.nlm.nih.gov/pmc/articles/PMC4239510/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4239510/) 



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PEOPLE

**George Weston Foods appoints new CFO**



Lorna Raine

George Weston Foods has appointed Lorna Raine as chief financial officer to oversee its four business units, Tip Top Bakeries, Don, Mauri ANZ and Jasol.

The role sees Raine tasked with leading the financial strategy and managing performance measures for George Weston Foods.

Raine was recently a senior finance executive at Fairfax Media, and prior to this held senior management roles with Yum! Restaurants International including general manager operations at KFC.

Before relocating to Australia, Raine was chief financial officer for McDonald's South Africa where she was instrumental in the creation and execution of the organisation's strategic plan through a period of rapid expansion.

She is also currently a non-executive director on the board of Dick Smith.

**Patties Foods appoints two new senior staff members**



Bethany George

Two new general managers have joined the Patties Foods house.

Bethany George will join the company as general manager, in-home, and Stuart Smyth as general manager of marketing and innovation.

George has extensive fast-moving consumer goods sales experience for companies such as Sanofi, Wrigley, Independent



Stuart Smyth

Distillers, Unilever and Campbell's, while Smyth joins Patties Foods from Lavazza, where he was national marketing manager, responsible for all marketing activity across both the retail and food service channels.

Smyth will manage Patties Foods' brand strategy development, advertising and innovation programs for all key brands. He will also personally manage the marketing and activation activities for the Four'N Twenty brand.

**Dairy Australia names new board members**

Following Dairy Australia's annual general meeting, the organisation has elected its new board.

The former chair and president of the Institute for Chartered Accountants, Jan West AM, and dairy farmer and chair of WestVic Dairy, Lisa Dwyer, were elected as non-executive directors to the board of Dairy Australia for the first time.

West, standing for a director position with finance and governance skills, was elected unopposed.

West has a wealth of experience in the finance, audit and board membership. She currently sits on three boards, including Australian Red Cross, and two government department audit and risk committees.

Dwyer stood for one of the two director positions assigned to members with backgrounds producing milk. She is currently chair of WestVic Dairy and a non-executive director with the Australian Livestock Export Corporation Limited.

Chair of Dairy Australia and dairy farmer Geoff Akers was re-elected as a director. 🇺🇸

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AIFST

## BOARD UPDATE

Since the Extraordinary General Meeting in October 2014, the new Australian Institute of Food Science and Technology (AIFST) Limited Board has held two meetings and agreed on a number of important initiatives to guide the Institute through 2015 and beyond.

**Board Charter:** The Board has signed off on the Board Charter, which will be made available to all members on the AIFST website in early February.

**New CEO:** The recruitment for the newly established role of Chief Executive Officer for AIFST is underway and the board is pleased with the calibre of the applications received to date. The Selection Panel has been convened, and it is anticipated that a short-list of candidates will be presented to the Board at its February meeting.

**Corporate Affairs Manager:** Mel Malloch commenced her new role as Corporate Affairs Manager on 1 January with responsibility for ensuring the continued success of our flagship publication, *food australia*, and the development of other areas of stakeholder engagement and corporate relations.

The **Institute Leaders Forum (ILF)** will have its first meeting in February under the chairmanship of AIFST Board Chair, Dr Anne Astin. The ILF members will be current chairs of branch committees and special interest groups and will provide the important link for maintaining ongoing engagement of members with the AIFST Communications Board.

The **Publications and Communications Committee (PCC)** – led by Board member Fiona Fleming, and comprised of Lorraine Belanger, Michael Eyles, Ramon Hall and Lisa Szabo – is very excited to announce a new committee member, Dr Tom Ross. Dr Ross is a longstanding member of AIFST and was the winner of the 2014 Keith Farrer Award of Merit for his outstanding contribution to food science. The PCC oversees all communications activities for AIFST and in 2015 its focus will be on developing and implementing a new communications strategy to raise the profile of the Institute and attract a broader membership base.



Dr Tom Ross

## AWARDS 2015

AIFST has a long history of recognising outstanding achievement in food science and technology through its annual awards. The call for nominations for the 2015 awards is now open. Please review the categories below and if you know anyone deserving of one of our prestigious awards, please submit your nomination to Mel Malloch at national office on [mel@aifst.com.au](mailto:mel@aifst.com.au).

**Keith Farrer Award of Merit:** This award is made for achievements in food science and technology in the wide areas of research, industry and education and contributions to further the aims and objectives of the Institute.

**Food Industry Innovation Award:** This award recognises a significant new development in a process, product, ingredient, equipment or packaging, which has achieved successful commercial application in any section of the Australian food industry within the past six months to five years.

**AIFST President's Award:** This award recognises outstanding contribution to the Institute, and may be awarded to a member of the Institute (either corporate or non-corporate), a non-member of the Institute, any organisation or company.

**Malcolm Bird Commemorative Award:** This award was established in honour of Malcolm Bird, the fifth president of the Institute. The award is for AIFST members under 30 years of age at 30 June 2014, and recognises young members who demonstrate academic achievement, leadership and integrity in their profession.

**Bruce Chandler Book Prize:** The late Dr Bruce Chandler bequeathed to AIFST a sum of money to establish a Book Prize for a book published in the past six months to five years, judged to make the greatest contribution to food science and technology.

**Jack Kefford Award:** This is awarded annually for the best nominated food science and technology paper published in a peer-reviewed journal (print or electronic) by an AIFST member or members in the previous year.

**Student Product Development Competition:** This competition is open to groups of undergraduate AIFST student members. Entries consist of a proposal for a new food product, with two finalist teams to prepare a full written report and give an oral and poster presentation and product sampling at the AIFST Annual Convention. Up to three members of each finalist team will attend the Convention at AIFST expense.

**Nominations close 20 March 2015.**



## 2015 CPD PROGRAM

The 2015 CPD program is off to an exciting start with the Ingredients Series, a series of sessions designed to provide up to date and relevant information about the different ingredients used for food production. The first will be held in Melbourne on 10 February 2015 and will focus on thickening stabilisers. For those unable to attend, a webinar will be available on the AIFST site shortly after the event.

Food Labelling 101 is a series of workshops in Melbourne on 5 March, Sydney on 12 March, Brisbane on 18 March, Adelaide on 25 March and Perth on 26 March. The events are being held in conjunction with Australian Food & Grocery Council (AFGC) and the Allergen Bureau and will include presentations from leading experts at each organisation as well as Food Standards Australia New Zealand.

Plastic Packaging and Shelf Life is a two-day workshop held in Sydney on 21-22 April. It will cover information about



plastic packaging by discussing the basic principles behind deteriorative reactions in foods, indices of failure, polymer permeability and shelf life. These are just a few of the Continuing Professional Development (CPD) events for 2015; be sure to visit the CPD section on the AIFST for updates or contact [Bronwyn@aifst.com.au](mailto:Bronwyn@aifst.com.au).

## 2015 CONVENTION

Plans are in full swing for the 2015 annual convention, which will be held this year at Sydney's iconic Luna Park from 11-13 August. The convention will be held in conjunction with the 15th Australian Food Microbiology Conference for the first time and the two events together will definitely make it one of the major food industry events for 2015. The program theme is *Food For All*, and the presentations will highlight the latest developments in building a sustainable food industry across Asia, along with the influence manufacturers, retailers and consumers have on trends and processes. The program also features food safety and through-chain microbial regulation, interactive workshops on food labelling, verification and validation, as well as an all-day workshop on entrepreneurs in food industry.

For more information visit [www.aifst.asn.au](http://www.aifst.asn.au). Registrations open in February.

## MEMBERSHIP RENEWAL

If you haven't yet renewed your membership, do so now at [www.aifst.asn.au](http://www.aifst.asn.au). That way you will continue to receive your bimonthly copy of *food australia*, as well as accessing the wide range of member benefits, including discounts on the annual convention, continuing professional development program seminars, workshops and networking events, and industry reference books.



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AFGC

# FOOD PACKAGING – NOW RUNNING THE REGULATORY GAUNTLET

*Best practice guidelines have the potential to reduce regulatory compliance cost for food companies through clarifying and simplifying requirements.*

Words by Geoffrey Annison

Food Standard Australia New Zealand (FSANZ) closed its initial consultation for Proposal 1034 *Chemical migration from packaging into food* in late December 2014. The Australian Food & Grocery Council (AFGC) and the broader food and packaging industry has, of course, been aware of the FSANZ proposal for some time, as P1034 was preceded by a long period of information gathering by FSANZ. This included discussions with key industry organisations as well as conducting analytical surveys to determine the levels of migrating chemicals in food products.

In Proposal P1034, FSANZ concedes there is little evidence indicating a public health issue which needs addressing (no ill effects on the population from food packaging have been identified). Rather, this is an attempt to reduce residual risk arising from:

- uncertainty regarding the nature and quality of packaging material used throughout the food industry. Particularly, there is a concern that some imported packaging material used by small to medium size companies may not be of the same quality as packing material provided by the large suppliers and used by larger food companies; and
- uncertainty as to whether there are specific population groups at higher risk. The data on the levels of migrating chemicals in foods is not sufficiently comprehensive to allow reliable dietary modelling.

Of course current regulations already



require food packaging to be safe. The *Model Food Act* offences in relation to 'unsafe food' remain the principal means by which food safety is guaranteed. The definition set out in the *Model Food Act* provides:

*For the purposes of this Act, food is unsafe at a particular time if it would be likely to cause physical harm to a person who might later consume it...*

Further, the *Model Food Act* offences relating to 'unsuitable food' are of particular relevance to the migration into food of chemicals from packaging. The relevant definition provides:

*For the purposes of this Act, food is unsuitable if it is food that:*

*(d) contains a biological or chemical agent, or other matter or substance, that is foreign to the nature of the food.*

These prohibitions must then be read in conjunction with Standard 1.4.1

of the Food Standards Code (FSC), which specifies the maximum level of a specified contaminant which is permitted to be present in a nominated food. Provision is made in clause 3(3), for example, in relation to the maximum level of vinyl chloride permitted in all food except packaged water.

The *Model Food Act* provisions, as enacted by each jurisdiction, together with FSC thus provide an existing basis for regulating packaging by reference to the safety of the food as consumed. Improvements in chemical detection, however, are now testing these regulatory arrangements. The AFGC has suggested there should be a general allowance in the FSC for chemical migrations under a specified level unless specifically regulated to a different level based on evidence of risk. This would align the FSC with aspects

of overseas regulatory arrangements, which provide both general limits and specific limits on the levels of migrating chemicals in foods.

Of course, there is a danger that during discussion of possible public health risks associated with packaging, a fundamental truism will be lost – that food packaging provides an enormous public benefit. Without food packaging, food safety and quality would be greatly compromised, food wastage would be a magnitude greater, the impact of food production on the environment would be larger, food costs for consumers would be higher, and the diet of many consumers would be compromised for much of the year.

Food packaging is an integral and fundamental component of the great majority of food products including those which are marketed in the 'fresh' section of the supermarket, as they invariably have come into contact with some form of packing material. Packaging is a key component of the suite of technologies which work together to provide shelf stable foods, to protect perishable foods to extend their shelf life, and to provide

consumers with seasonal fruits and vegetables year round.

It is critically important, therefore, that as the consultation on P1034 progresses, it does not inadvertently cast doubt on the current very high level of safety acknowledged to exist with current packaging practices. Rather, the intent should be to clarify regulatory requirements and provide best practice guidance to industry, and particularly, to smaller companies. In its submission to FSANZ, the AFGC has suggested that the *Implementation Subcommittee for Food Regulation* (ISFR), in conjunction with industry, should prepare an industry best practice guideline which would include:

- a description of the regulatory requirements relating the public health risk from the migration of chemicals from packaging into food
- identification of where the responsibility lies for ensuring chemical migration risks are managed
- steps industry might take to demonstrate compliance with the regulatory requirements – referencing overseas standards may well be

part of industry demonstrating that packaging used is safe and suitable

- agreed enforcement strategies which will be pursued by the jurisdictions.

The AFGC stands ready to work with FSANZ, Implementation Subcommittee for Food Regulation (ISFR), and colleagues in the packaging industry to assist in preparing the best practice guideline.

This approach has the potential to reduce regulatory compliance cost for food companies through clarifying and simplifying requirements, and this is the basis for AFGC support. The AFGC remains mindful, however, that P1034 has the characteristics of *a solution looking for a problem* – it has not identified, let alone quantified, a clear public health risk. And this in itself stretches the boundaries of good regulatory practice. Despite this, minor regulatory changes, supported by new industry guidelines, would be welcomed by the AFGC and the wider industry. 4

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

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# INGREDIENTS MOVING BEYOND TRADITIONAL OFFERINGS

*What do the consumer trends toward functional wellness, sustainability and high protein mean for the ingredients market in 2015 and beyond?*

Driven by the trends toward health and wellness, the functional food ingredients hold the largest market share of the global specialty food ingredients market – a market that is projected to exceed \$80 billion by the year 2018, with an annual growth rate of six per cent.<sup>1</sup>

## Functional wellness

As consumers continue to seek out new ways to get healthier, and health and nutrition science uncovers new 'superfoods', food scientists are working to identify technologies to deliver their benefits in food products. Here are some of the latest research and innovations.

### Curcumin

The demand for simpler, cleaner ingredient statements has seen the increasing use of ingredients derived from fruits, vegetables and spices.

A spice that is attracting attention is curcumin due to its reported health benefits including antioxidant, antiatherosclerotic and anti-inflammatory properties. It may play a role in prevention of diabetes, Alzheimer's, multiple sclerosis, cardiovascular disease, lung fibrosis, arthritis, and inflammatory bowel disease.<sup>2,3</sup>

However curcumin poses a challenge for food technologists, due to its low solubility in aqueous solutions and its poor bioavailability. In response, researchers have been investigating the complexation of curcumin with food protein<sup>4</sup> and the encapsulation of curcumin in starch.<sup>5</sup>

New research by CSIRO<sup>6</sup> has investigated oat fibre as a carrier for curcuminoids for functional food applications. In characterising its



potential as a carrier for curcumin, the researchers also examined the partitioning of curcuminoids between the soluble and insoluble fractions of curcuminoid – oat fibre dispersions.

The research showed that both protein and  $\beta$ -glucan components of oat fibre are able to interact with curcuminoids and increase solubility in an aqueous solution of 2% v/v EtOH, and illustrate the potential for oat fibre to be used in the fortification of food with curcuminoids.

### Innovative product development for probiotics

Increasing understanding of the important role the gut microbiota play in improving health outcomes is fuelling consumer awareness and interest in probiotics. Dairy products are good vehicles for probiotic delivery, with cheese specifically noted for its (generally) higher pH, which means it can protect the microorganisms against the harsh conditions found in the gastrointestinal tract (GIT), thereby helping to maintain high cell viability rates.<sup>7</sup>

New research<sup>8</sup> conducted by researchers at the University of Sao Paulo in Brazil investigated an innovative product using dairy as a vehicle for probiotic delivery, and combining it with tomato for its antioxidant benefits, including lycopene,  $\beta$ -carotene, and vitamin C.

Three different products were studied, all containing the prebiotic inulin and the starter culture *Streptococcus thermophilus* ST-M6: T1 (control); T2 with the probiotic strains *Lactobacillus acidophilus* NCFM and *Bifidobacterium animalis subsp. lactis* Bb-12; and T3 with Bb-12 and the bacteriocinogenic and potentially probiotic strain *Lactobacillus sakei subsp. sakei* 2a.

It found that the innovative spread was technologically feasible and exhibited high viability results for the beneficial microorganisms *Lb. acidophilus* NCFM and Bb-12 during the entire period of storage tested. Additionally, *Lb. sakei subsp. sakei* 2a, a bacteriocinogenic and potentially probiotic strain, showed

high counts throughout the product storage and could, therefore, be adequately incorporated into the product dairy matrix. In addition, *the* product was well accepted by consumers in sensory evaluation.

### Sustainability

As well as seeking foods that provide solutions to their nutritional challenges and overall health and wellness, Australians have a preference for food products that use a country's resources in an environmentally sustainable way.<sup>9</sup>

#### The buzz around Bugs

Partnering environmentally sustainable food choices with the trend toward high protein diets, and the buzz around bugs gets louder. But just how likely is it that traditional protein sources will ever be replaced by insects?

Research conducted by the University of Belgium<sup>10</sup> profiled consumers who are ready to adopt insects as meat substitutes in Western society. They found that the likelihood of adopting insects as a substitute for meat is significantly higher among males than females (12.8 per cent vs 6.3 per cent), and that people who are intending to reduce fresh meat intake are 4.5 times more likely to adopt insects.

People with a stronger orientation to convenience and a higher interest in the environmental impact of food choices had an increased likelihood of adopting insects by 75 per cent and 71 per cent per unit increase in these predictors' scores, respectively. By contrast, a one-unit stronger belief that meat is nutritious and healthy, and a one-unit higher importance attached to taste for meat lowered the predicted odds by 64 per cent and 61 per cent, respectively.

According to the researcher, the study reveals that the most likely early adopters of insects as a novel and more sustainable protein source in Western societies are younger males with a weak attachment to meat, who are more open to trying novel foods and interested in the environmental impact of their food choice.

When it comes to a potential market for insects and insects or insect-based ingredients, like cricket flour, this research offers interesting consumer insights for product development, market positioning and communication strategies.

The researchers note the environmental concern of food choices was not the



primary focus for the participants in their study and as such, stressing personal health benefits might appeal more to consumers' interests and be more effective since they did report health as a strong influencing factor in their food choices. While in the study, health seemed to play only a marginal role in influencing people's willingness to adopt insects as a food-stuff, the researchers suggest that this is likely to be because people are not aware or not yet convinced of the possible health benefits of substituting insects for meat. That said, the overall low general preparedness to eat insects as a meat substitute suggests that strong marketing will be needed.

One of the key benefits of this study is the identification of the likely early adopters, who can be targeted as possible trendsetters. The profile of this group is younger males with weak attitudes towards meat who are open to trying novel foods, and who are interested in the environmental impact of their food choices. The likelihood that this type of person is ready to adopt insects as a meat substitute is more than 75 per cent.

Despite the predisposition of the likely early adopters, given in this study the total group represented less than 10 per cent, marketers have a big job on their hands. And while sustainability matters to Australians in their food choices, it doesn't matter enough to have them compromise on convenience or taste, according to the Ipsos Food Health Report. Curcuminoids and probiotics are feeling like an easier sell.

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# INULIN FRUCTANS

*The European Food Safety Authority has recently approved a health claim for chicory inulin improving bowel function. New research reviews the role of inulin fructans in the human diet.*



## EFSA health claim

Opening up new opportunities for new food and drink applications globally, the European Food Safety Authority (EFSA) has recently approved a health claim for chicory inulin in relation to improving bowel function.

In response to an application by global ingredients company BENEIO, EFSA concluded that a cause and effect relationship has been established between the consumption of chicory inulin, a non-fractionated mixture of monosaccharides (< 10 per cent),

disaccharides, inulin-type fructans and inulin extracted from chicory, with a mean DP  $\geq 9$ , and maintenance of normal defecation by increasing stool frequency.

In weighing the evidence, the panel took into account that six studies involving 86 subjects consistently showed that consumption of at least 12 g/day chicory inulin increases stool frequency.

## New research review

A new research review has examined the role of inulin fructans in the human

diet.<sup>1</sup> The researchers found that while inulin fructans belong to the compounds we collectively call dietary fibre, it is important to specify the fibre effects because, while including inulin fructans in food products does increase fibre intake, the benefits of these are not necessarily the same as the fibre from fruit, vegetables, cereals and other foods.

Inulin fructans stimulate saccharolytic fermentation in cecum and colon. This results in the formation of short chain fatty acid (SCFA), lactate, and gases

(CO<sub>2</sub>, H<sub>2</sub>, and CH<sub>4</sub>), and in a reduction of the luminal pH. Short-chain fatty acids (SCFA) have trophic effects on the mucosa and a low pH inhibits the growth of potentially pathogenic bacteria.

Long-chain inulin is more slowly fermented than short-chain fructo-oligosaccharides (FOS), and mixtures of these fructans may contribute to spreading the saccharolytic fermentation throughout the colon. This will help to reduce proteolytic fermentation in the more distal parts of the colon and reduce the formation of toxic compounds, such as phenols, indole and ammonia.


The saccharolytic fermentation increases bacterial mass and defecation frequency and helps to prevent constipation. All these effects are physiological and beneficial, and are typical dietary fibre effects. Undesirable side effects (flatulence, bloating, borborygmus), frequently called intestinal discomfort, may occur at higher doses, but generally do not occur at doses below 20 g/d, when the dose is spread over the day and taken with meals.

According to the researchers, another well-documented effect of inulin fructans is their bifidogenic potential. Because of this potential, oligofructose and inulin are called prebiotics. Although up to now it has been difficult to prove that a bifidogenic effect is beneficial to health, there are indications that this is the case.

Bifidobacteria dominate the flora of breast-fed infants and this, at least in part, is the consequence of the high nondigestible oligosaccharide content of breast milk. Infant formulas with added nondigestible oligosaccharides are also bifidogenic and this has been shown to be helpful in the prevention of allergy in children. This suggests that oligosaccharides can benefit the gut-associated immune system.

Overall, the review concludes that supplementing the diet with inulin fructans can help to increase total fibre intake, have proven bifidogenic effects and can change the composition of the gut flora in a way that is considered beneficial. The authors do note, however, that the benefits for gut flora lack definite proof for specific, well-defined, benefits on disease or other validated health parameters. A notable exception here is allergy reduction in infants and children.

Acknowledging the impact the human intestinal flora seems to have more on the development of several chronic diseases, the authors note that more research is needed to establish the effects of inulin fructans on the intestinal flora and the role those effects may play in the prevention of chronic disease.

In considering additional areas for future research, the authors identify the effects of oligofructose and inulin intake on energy balance, mediated via the gut-brain axis, and on low-grade inflammation, associated with the metabolic syndrome and obesity. 

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# PREPARING FOR A FRESH PRODUCE FOOD SAFETY CRISIS

*A series of fresh produce contamination incidents in Australia, New Zealand and around the world over the past year reminds us of the importance of crisis preparation.*

Words by *Richard Bennett*

The US apple industry is in the process of dealing with a major crisis – an outbreak of *Listeria monocytogenes* linked to caramel apples that used Granny Smith and Gala apples. There have been three deaths, one foetal loss and more than 30 hospitalisations. The apples were isolated to the Bidart Bros. processing facility in California. The family growers instigated a full-scale recall of all Bidart Bros. Granny Smith and Gala apples still available in the marketplace.

Unfortunately, California was the location of another of 2014's major horticulture recalls in July – Wawona stone fruit. In a classic case of 'different country: different rules', an Australian importer detected a very low level of *Listeria monocytogenes* that under the new Australian standard for *L. monocytogenes* meant that the product was not considered unsafe.

Regardless, Wawona conducted extensive testing of their facilities. Although they too only found low levels, the company then initiated a massive international voluntary and precautionary recall because of the US 'zero tolerance' standard for *L. monocytogenes*.

The above examples remind us that contamination events arrive without warning and that they are often the unexpected, meaning that each case comes with its own set of circumstances, complexities and responses.





Closer to home, there were nine food safety issues with the potential to bring reputational harm to the Australian-New Zealand produce industry in 2014. It was a relatively quiet year; by comparison, there were 22 for Australia in 2013.

The major event in the region was the New Zealand outbreak of *Yersinia pseudotuberculosis*. There were 217 cases reported of which 65 were hospitalised and another 18 cases were suspected to be *Y. pseudotuberculosis*. NZ media coverage appeared to be almost daily across this period as theories were developed and dispelled. Retail products were pulled and implicated growers had media camping outside their properties.

While microbial contamination and undeclared allergens remain the most common reasons for food recall, intentional contamination is also an issue for which the industry needs to be prepared.

It's a sad reflection of society that there are people out there who, for reasons best known to themselves, seek to injure consumers and destroy the reputation of supply chain members by intentionally contaminating produce. It could also be that they want to create mayhem by destroying the ability to produce – the plants themselves – but whether it's plants or produce, they both come under the heading of 'sabotage'.

There's a particularly nasty episode being played out in Canada right now, and has been for several months. First, an undisclosed number of sewing needles were found by consumers in potatoes from Linkletter Farms, in the Prince Edward Island (PEI) region, last October. More recently, in late December, Cavendish Farms, a PEI potato processor, detected sewing needles in potatoes harvested for French fry production.

Cavendish has metal detection units that picked up the problem and enabled production to be temporarily halted while potentially contaminated product was quarantined. There was no need to recall product. Linkletter, on the other hand, was shut down for over two months, put off 20 staff and recently resumed packing at a greatly reduced capacity, having installed not



one but two metal detectors on their one operational line.

Needless to say, police crime and forensic units are involved. The PEI potato industry has put up its own \$100,000 Food Tampering Reward for information leading to a conviction.

These incidents are not unique to potatoes or to Canada. Australia has had its own incidents and a few cases come quickly to mind:

- The Bowen region in Queensland has been targeted repeatedly, at least four times from 2002-10. In 2002, six million tomato seedlings in a nursery were killed by glyphosate in the water supply; in 2006, the water supply used by an aerial spraying contractor was contaminated and 40 hectares of bearing tomatoes, capsicums and melons were killed. In 2010, seven million tomato, capsicum, melon and eggplant nursery seedlings and 16,000

mature hydroponic tomato plants succumbed. No culprit has been charged and police reopened the case in October 2014.

- In 2006, a foreign object contamination at Safeway, in Bayswater, Victoria, resulted in a consumer recall of all produce sold on 31st October. The store closed at 4pm while police investigated and staff replaced all stock in the fresh produce department overnight. No extortion threat was received.
- In May 2011, the Sunshine Coast's biggest strawberry farm detected herbicide in its irrigation supply during a daily inspection routine, just before 68 hectares were irrigated. Media reporting of such incidents vary, and there's a big difference between coverage of unproductive seedlings being the target (sympathy for the industry, likely higher prices for consumers, workers laid off) and



contaminated fresh produce being harvested, packed and sold before the problem becomes apparent in the field (little if any sympathy, strong hints of unprofessional, possibly deceptive behaviour, the wider issue of pesticides). Then there are the issues of copycat behaviour and ongoing media coverage.

Whether it's a disgruntled former employee, genuine agri-terrorism or a lone person with a mental illness, there are steps businesses can take to prevent and prepare.

Basic security like locks on pump, machinery, fertiliser and chemical sheds are a good start, and even surveillance cameras if the risk warrants such measures. Report thefts, particularly herbicides – they could be about to be used elsewhere. Routine checks like the strawberry case might sound onerous but they have certainly paid off.

### So are you prepared?

Businesses certified to the major quality assurance (QA) systems will know about business continuity and crisis management requirements.

In order to help industry members respond to a crisis or uncontained situation, Horticulture Australia (now Horticulture Innovation Australia), developed the *Horticulture Industry Crisis Management Guidelines*. The guidelines are applicable on an individual company level, specific industry level or to a cross-section of the horticulture industry.

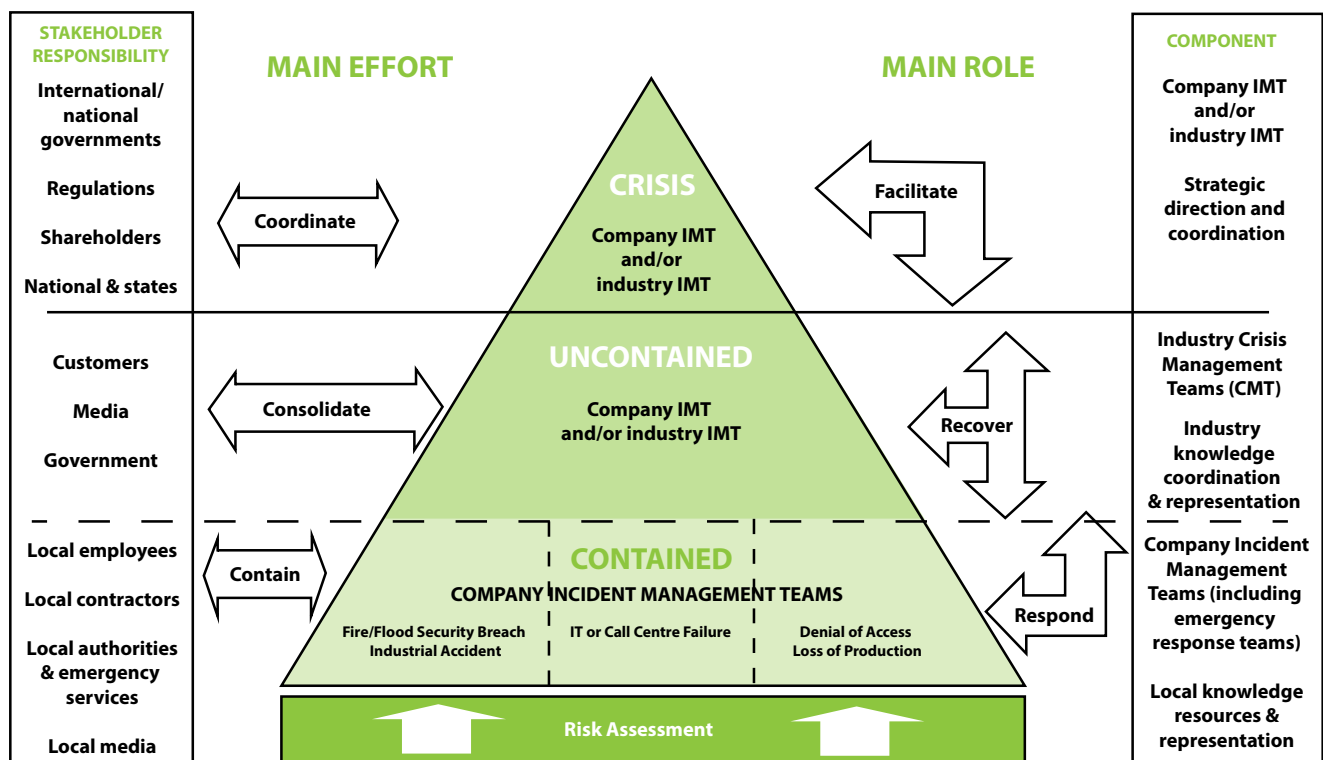
The guidelines outline a framework for the key horticulture industry stakeholders (below) and include a self-assessment tool for Peak Industry Bodies, to determine preparedness to manage an uncontained situation. It covers contingency planning and management of the crisis such as:

- recall protocols
- media responses
- customer and consumer inquiries
- emergency quality assurance.

While there is no prescriptive single response to address all potential crisis events, the guidelines are designed to optimise the way in which an incident with implications for the horticulture sector can be managed. It includes a Typical Response Flow (opposite page) to support the decision making process for the crisis management team.

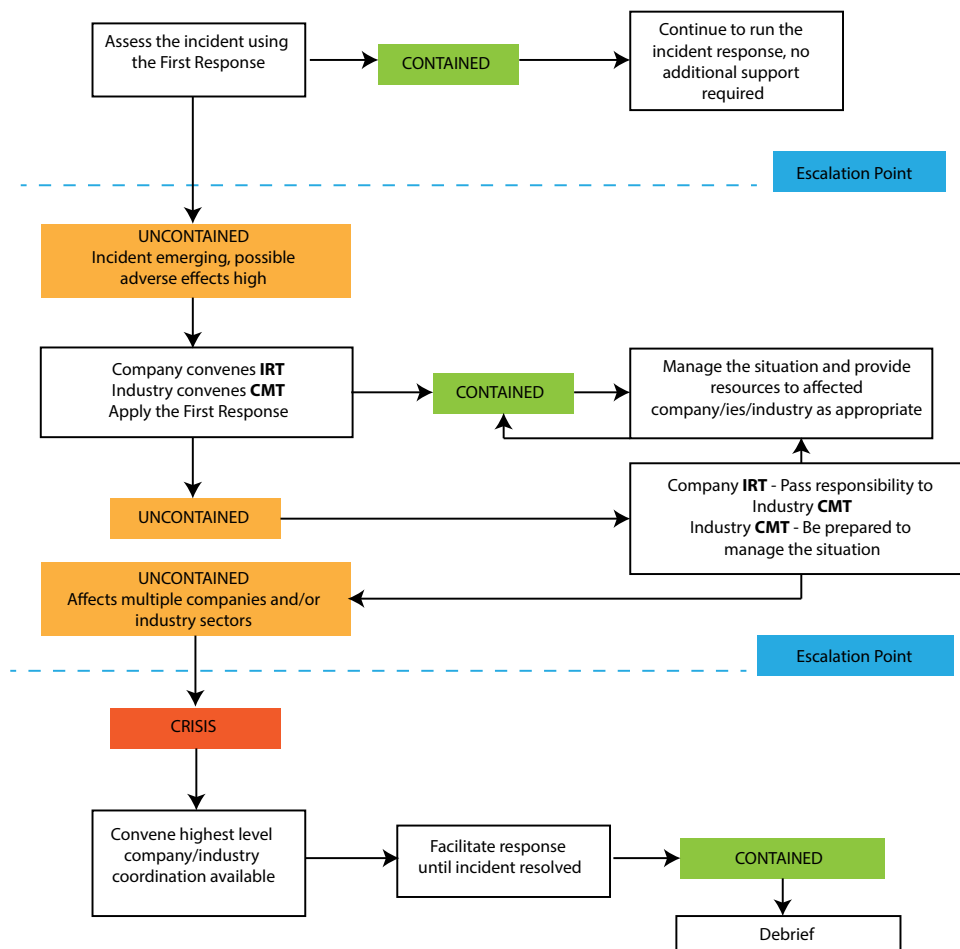
The guidelines provide a clear understanding of key stakeholder responsibilities and procedures that should be followed during such an event, and ultimately will assist in ensuring public safety and continued/restored confidence. A copy of the Horticulture Industry Crisis Management Guidelines is available at [www.pma-anz.com](http://www.pma-anz.com)

## A Suggested Horticulture Industry Crisis Management Framework



## Typical Response Flow

INCIDENT OCCURS AT COMPANY, INDUSTRY OR MULTIPLE COMPANY/INDUSTRY/HORT INDUSTRY LEVEL



### What does the future hold?

Advances in technology will continue to improve product identification and traceability. Effective traceability is essential to identify the source of a contamination, isolate the problem and minimise 'damage by association'. Without quickly identifying the source, an entire sector or sectors of horticulture will probably come to a standstill in a few days.

It is anticipated that Australian retailers will begin to roll out GS1 DataBar throughout 2015, providing a new level of fresh produce data generation, collection and use. GS1 DataBar allows users to encode additional information into the barcode such as expiry dates, weights, batch numbers, serial numbers and more. GS1 DataBar creates another avenue for traceability and recall, one that already exists for packaged groceries.

One area under constant scrutiny at present is that of verification testing. There seems to be momentum building for change, or at least confirming what we are doing in this space. Certainly, there is increasing availability of rapid testing techniques but whether these have the specificity and reliability required is still debated. We will know a lot more about this area in 12 months' time.

The more sophisticated end of product identification and traceability is also evolving rapidly. With requirements to prevent food fraud evolving and set to become embedded in QA standards from 2016, techniques such as isotope analysis and whole genome sequencing will build a virtual global library of fresh produce fingerprints. These techniques will move from one-offs to more widespread application, and 2015 will be the turning point. <sup>11</sup>

*Richard Bennett is the technology manager at PMA Australia-New Zealand Limited (PMA A-NZ), the first stand-alone global affiliate of the Produce Marketing Association (PMA Global). As the leading global fresh produce trade association, PMA Global serves member companies in every segment of the fresh fruit, vegetable, and floral supply chain around the world. Bennett is also the technology manager at the Fresh Produce Safety Centre Australia-New Zealand (FPSC), which was recently established to enhance fresh produce safety through research, outreach and education. For further information and insight on food safety and traceability issues, including Bennett's fortnightly blog, please visit [www.pma-anz.com](http://www.pma-anz.com) and [www.freshproducesafety-anz.com](http://www.freshproducesafety-anz.com).*



# NATIONAL FOOD INCIDENT RESPONSE

*Government and industry working together.*

Words by *Amanda Hill and Peter Day*



Food incidents can be deadly. As well as the potential for serious harm to the health of consumers, incidents can lead to widespread consumer concern and significant disruption to domestic and international trade. Government agencies need to respond quickly and in a coordinated way to minimise the effect of incidents. In October 2003, the then Food Implementation Subcommittee (ISC), now the Implementation Subcommittee for Food Regulation<sup>1</sup> (ISFR), recognised that an agreed protocol formalising current response approaches was the best way to ensure a timely and coordinated response.

The *National Food Incident Response Protocol* (the Protocol) was subsequently developed and endorsed by the ministers responsible for food regulation (through the then Australia and New Zealand Food Regulation Ministerial Council) in 2007 to provide clear

guidance to Australian government agencies on responding to national food incidents in a timely, appropriate, consistent and coordinated manner. While New Zealand maintains its own incident response system, the Protocol involves New Zealand as part of a bi-national approach.

The Protocol provides guidance on the response to national food incidents linked to microbiological, chemical, radiological, physical or unknown hazards. A food incident is defined as 'any situation within the food supply chain where there is a risk, potential risk or perceived risk of illness or confirmed illness, associated with the consumption of a food or foods' and relates to an issue that could, or is expected to, impact on multiple government jurisdictions'.

The Protocol acts as a link between the protocols of Australian Government and state and territory agencies

responsible for food safety and food issues; formalises arrangements between agencies; and defines roles and associated responsibilities by providing a logical and smooth escalation and de-escalation of activities and agency involvement as appropriate. FSANZ performs a number of key coordination roles under this arrangement including National Food Incident Coordinator, Risk Assessment Coordinator and Communications Controller.

## **Early information sharing and communication**

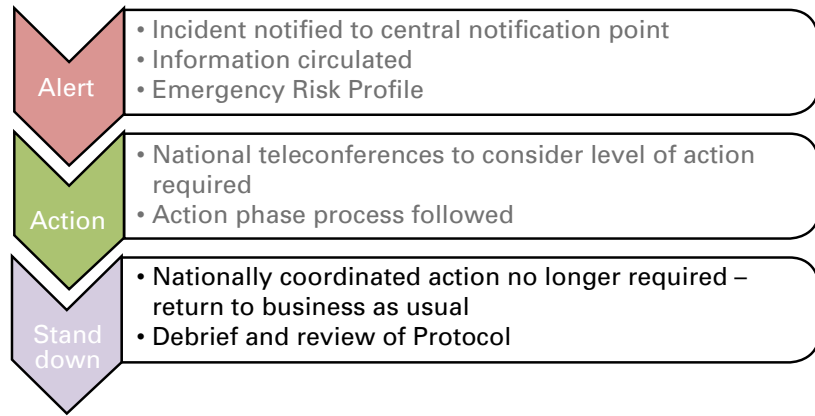
Food safety issues can be identified in a number of ways including a multi-jurisdictional outbreak investigation, food recalls or intelligence from industry, local/state government or international counterparts. While the Protocol has been a valuable tool for responding to food incidents in

1. The Implementation Sub-Committee for Food Regulation (ISFR) was established to develop guidelines on food regulations and standards implementation and enforcement activities. ISFR comprises representatives from the Commonwealth, each State and Territory jurisdiction and New Zealand and includes representation from the Australian Quarantine and Inspection Service, Food Standards Australia New Zealand and a representative of Australian local government. ISFR members are responsible for food safety and food issues and include the government agencies in each jurisdiction with statutory responsibility for food safety.

Australia, food regulatory authorities recognised that early identification and intervention on potential issues can minimise escalation and the effect of a food safety incident.

Sharing information early and good communication are vital to identifying issues early and being able to act on those issues if necessary. The National Food Safety Network was established by ISFR in 2014 to routinely share information and determine whether any actions are necessary. FSANZ provides a coordination and information sharing/ communication role for the Network which includes all members of the health, agriculture and food agencies in ISFR. Actions are determined by the relevant government enforcement agency; however, all jurisdictions aim to be as consistent as possible.

Implementation of response action occurs under the relevant state or territory legislation, response plan, or protocol, and could include:



- initiating/ continuing investigations
  - communication activities
  - doing further risk assessment work
  - further jurisdictional discussions/ meeting
  - a food recall
  - triggering the Protocol
  - referring the issue to the relevant governing body for discussion.
- The operation of the Food Safety Network supports early engagement

with other government networks when relevant, such as the epidemiologists in the OzFoodNet<sup>2</sup>. Developing links with industry networks is another important part of the Food Safety Network and will be the focus of further development.

### Industry involvement

A number of industry arrangements are in place to respond to food safety

2. The Australian Government Department of Health and Ageing established OzFoodNet in 2000 as a collaborative initiative with Australia's State and Territory health authorities to provide better understanding of the causes and incidence of foodborne disease in the community and to provide an evidence base for policy formulation. Health departments from Australia's States and Territories are funded to employ epidemiologists to focus on foodborne illness surveillance. A coordinating epidemiologist ensures a consistent direction and methodology for OzFoodNet through consensus. OzFoodNet analyses data on foodborne diseases in Australia. These analyses enable the network to identify outbreaks linked to particular infections, and to help health departments to detect problems with food or water safety.

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incidents and, in many cases, these arrangements have been formalised through structured incident response processes and plans. Consultation with industry is a key activity in responding to national food incidents and may occur at a national level or jurisdictional level depending on the situation and the response to the incident.

To enhance response arrangements, FSANZ and the New South Wales Food Authority hosted a National Food Safety Incident Response workshop on 25 November last year. Industry and government representatives met to discuss the food incident management frameworks for food incidents. This gave all attendees an opportunity to understand the various roles and responsibilities, discuss some of the challenges and the possibility of further engagement.

The workshop was attended by representatives from SAFEMEAT<sup>3</sup>; AusVeg; Produce Marketing Association – Australia & New Zealand; Dairy Australia; Australian Pork Limited; Australian Egg Corporation Limited; Meat and Livestock Australia; Cattle Council of Australia; Sheepmeat Council of Australia; Australian Meat Industry Council; SafeFish<sup>4</sup>; Australian Lot Feeders Association; Australian Renderers Association; Australian Food & Grocery Council; Woolworths Limited; Metcash Trading Limited; Coles Supermarkets Australia Pty Ltd; ALDI Stores; Food & Beverage Importers' Association; ISFR, and the Communicable Disease Network Australia.

The incident processes and tools used by government, a government-industry partnership and by industry were outlined and this was followed by a discussion to map the relationships between different food incident response plans and protocols, identify any key gaps and develop a key industry / sector / government




contact list for use in incident situations. A number of issues were discussed including the importance of maintaining relationships outside of a crisis; the value in having processes capturing coordination point contacts and identifying spokespeople; the value of mock exercises to ensure that protocols/processes are current and tailored to the business sector; the importance of undertaking debriefs following an incident and ways to share the lessons learned from incidents with industry and government.

Three of the more challenging issues explored were when to put a protocol into action, establishing clarity around roles and responsibilities; and communication with the right people and at the right time. Food incidents can occur at any point in the supply chain, involve producers, processors, wholesalers and retailers; product tracing can be complex and time is short. Alerting the appropriate government and industry groups of an emerging or current issue early so that the necessary actions can occur is critical to ensure confidence in consumers and trading partners, and reduce the flow on effects on resources. Having clearly defined roles and knowing who these people are and their responsibilities enables response actions to progress in the required

short timeframe. Communication is always highlighted in industry and government incident debriefs as an issue – who should communicate, to whom and when.

This workshop gave industry and government representatives the opportunity to exchange ideas and strategies with different stakeholder groups about crisis management plans, discuss previous successes and failures and learn how to potentially resolve issues in the future. Participants also suggested a number of topics for discussion at the 2015 workshop, including a review of some incidents that had occurred in the previous 12 months, what worked well, what didn't, what has changed since the incident and what can be done to improve; exploring the key roles identified in the response planning; and undertaking some case studies with small and large business.

The National Food Incident Protocol can be found at [www.health.gov.au/internet/main/publishing.nsf/Content/foodsecretariat-isc-food.htm](http://www.health.gov.au/internet/main/publishing.nsf/Content/foodsecretariat-isc-food.htm). 

*Amanda Hill manages the Food Safety and Response section at Food Standards Australia New Zealand and Peter Day is the director of Compliance Investigation and Enforcement at the New South Wales Food Authority.*

3. SAFEMEAT was established by the Australian Government as a joint government industry partnership to ensure that red meat products achieve the highest standards of safety and hygiene from farm to consumer and to provide strategic direction and policy advice to the red meat industry.

4. SafeFish is an industry-government partnership which provides technical advice to support Australia's seafood trade and market access negotiations and helps to resolve barriers to trade.



# HIGH ON THE RISK RADAR – REPUTATION RISK

*Reputation risk is top of mind for executive management, so here's how to manage it effectively.*

Words by *Liz Brown*



Reputation risk – it's not new, especially in the food industry, but in the age of social media and globalisation, it's an area that is garnering more and more attention from company executives. In fact, in a recent global survey by Deloitte of C-Suite executives and board members on reputation risk, 88 per cent of executives say they are explicitly focusing on it as a key business challenge. It was ranked the number-one risk concern for business executives surveyed.

Is it an over-reaction to dedicate such a large portion of time and

effort to public perception of a brand rather than focus on the products themselves? While this high focus on brand management may be a surprise to some, there is no escaping that this level of attention on reputation risk is the new reality.

Studies by UK-based firm, Reputation Dividend, on the value of the brands for listed companies in the US and UK provide some startling statistics. In 2014, brand value (and by extension, reputation) accounts for well over half the market capitalisation of the top 350 listed companies in the UK. That translates to over one trillion

pounds, and has doubled in the past four years. Consumer brand Unilever takes the top spot, with 58 per cent of their capitalisation comprising reputation value, and Diageo and SAB Miller also make the top five. The statistics for the US are just as significant – a colossal US\$3.7 trillion of the market capitalisation of the S&P500 is attributed to reputation value.

There are a number of reasons why this number-one prioritisation of reputation risk has become the norm in today's business environment, particularly in consumer-oriented industries like the food industry.

### Rise of social media

The most obvious reason for increased focus on reputation risk is the rise of social media. Its impact is threefold:

- Speed of dissemination – the old adage, ‘Bad news travels fast’, is exponentially amplified in the social media age.
- Breadth of news – the global nature of social media increases the potential coverage of incidents.
- Accuracy of information – the rise of ‘citizen journalism’ has increased the risk of inaccurate reporting. If retractions are published, they are rarely as widely publicised as the original article.

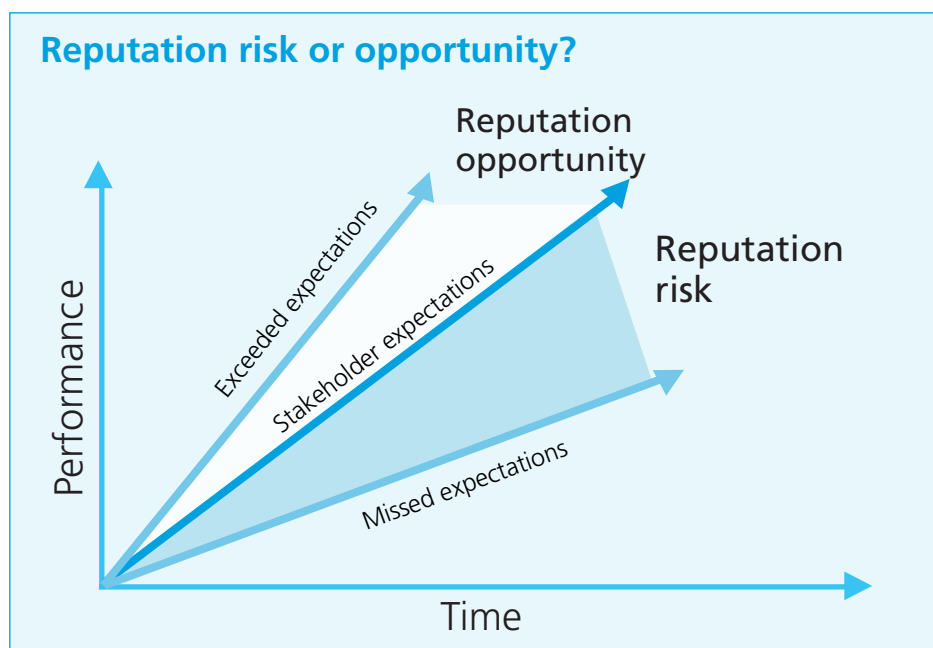
The very nature of reputation risk also means it is causally linked to many others – for example, a food contamination issue is first and foremost a safety risk. However, it also has the potential to cause major brand damage, particularly if the response is not managed well.

### Globalisation of manufacturing and supply chains

This represents another layer of risk with a flow on effect to reputation risk – organisations are more removed from direct control of production as they outsource manufacturing overseas, particularly to countries with different cultural and regulatory environments. This often means local business practices may not be in line with the standards expected for the global market, introducing more risk factors that may lead to incidents impacting reputation risk. The drive for ethical sourcing is aimed at addressing this concern.

The China tainted milk scandal back in 2008 is a classic example of where cultural attitudes toward regulation can be difficult to manage and have inadvertent and sometimes tragic consequences.

The scandal highlighted a corollary challenge with implementing new regulations. New standards and testing programs for the nutrient content of milk products had been introduced



in China to combat the practice of excessively watering down milk. However, this resulted in certain suppliers looking for ways to beat the nutrition tests so they could continue to water down their product and maintain profits. Adding melamine to their milk powder to artificially inflate the supposed nutrient content of the product allowed it to beat the nutrition tests, but resulted in the toxicity that led to a number of infant and toddler deaths from formula made with the tainted product.

It was a stark reminder of the challenges of changing attitudes toward regulatory compliance and how the actions of a few can influence the reputation of an entire industry.

The challenge of managing operations in different cultural and regulatory environments was apparent in the Deloitte reputation risk survey results, where executives ranked bribery and corruption as being key causes of brand damage. Third party relationships were also singled out in the survey, given brands are seen as being accountable for the behaviour of their third-party vendors. This also links to the issue of control – the survey indicated, not surprisingly, that companies are least confident about their risk management practices

in areas where the risks are beyond their direct control, and third-party ethics remains a challenging area to manage successfully.

### Cyber risk

As organisations gather more information on their customers such as through loyalty plans, and credit card details for online purchasers, cyber-security risks become more real for customers, and the impact on reputation from breaches escalates. The Deloitte survey results for the consumer and industrial products sector ranked security breaches as having the third highest impact on reputation risk.

### How to manage reputational risk – the benefits of forward planning

In simple terms, effective reputation risk management can be broken down into three broad stages:

- knowing the risks – both the underlying risks and their flow on impact on reputation and brand
- monitoring via key risk indicators to quickly identify if an issue has occurred or is likely to, and
- Crisis management – having a plan in place to react quickly and effectively in the event of an incident.



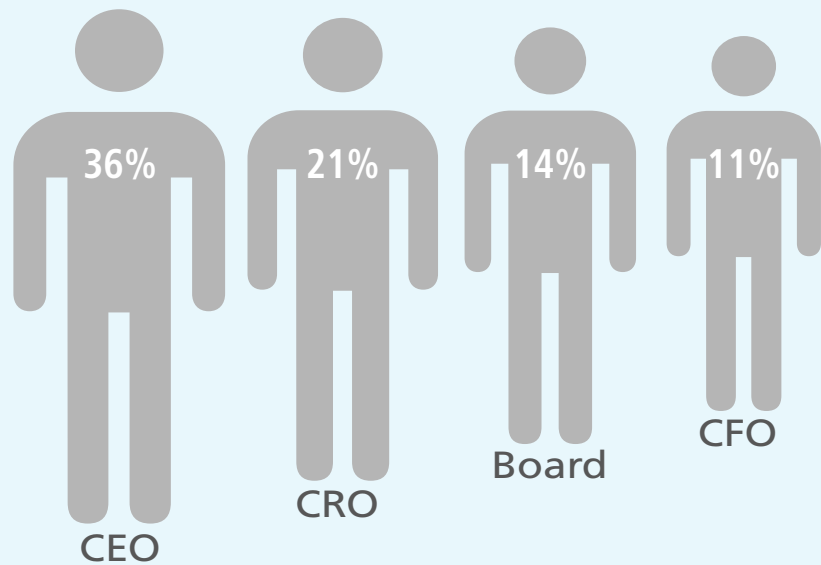
**Identify the potential risks**

The starting point for risk reduction is understanding the risks to your business. This allows risk mitigation plans to be developed to reduce the likelihood of an incident occurring, and can reduce the potential impact of an event through preparedness and the ability to respond promptly.

A key element of risk identification is knowing your stakeholders and what they value. Not surprisingly, the Deloitte survey indicated customers are the key stakeholders for the consumer business industry, driven primarily by the impact on revenue/ earnings from negative reputation events. Regulators, investors and employees are other stakeholders.

A strong reputational risk management program should use independent and objective data to identify and track stakeholder perceptions. The information gathered regarding stakeholder expectations can be used to assess and prioritise potential actions and strategies to reduce the likelihood of risks occurring to acceptable levels.

**Primary responsibility for reputation risk**



**Monitoring**

Timeliness in response is key to effective reputation risk management. An appropriate monitoring structure which gathers and analyses relevant data can provide early warning of potential events and facilitate timeliness.

An example may be interruptions in supply at a key port facility – proactive monitoring of what may affect the port, like industrial action or seasonal weather patterns, will allow better forward planning for potential interruptions, such as building up stock



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levels to provide a buffer, or activating alternative supply channels that reduce reliance on the port in the short term.

Social, mainstream and industry media monitoring is essential to detect early signals for emerging issues. It is important to validate if third-party issues are going to affect your operations or supply chain and address these issues promptly. Addressing the issue may also involve advising customers that the affected product or supplier is not used by your company.

Design key risk indicators to monitor potential reputation impacts. Data analytics is playing an increasingly large role in risk identification and assessment. The Deloitte survey found that data (surveys and traditional data analytics) and technology (eg brand monitoring tools) were the two highest ranking areas for future investment in reputation risk management across the consumer business industry.

#### **Crisis management**

Prevention is generally better than cure, but having plans in place to respond if an issue does arise is critical in minimising the impact of an event. Crisis communications is an area most people are familiar with, as it is the public face of crisis management. There are many examples of where it has been done well, but equally there are many spectacularly poor crisis communication performances. These performances can set the public perception of whether the company affected is in control.

While crisis communication is a key element of a crisis management strategy, the larger element of crisis management focuses on getting the issue resolved and under control – it's easier to deal with the media and public opinion when you can convincingly demonstrate competent management of the situation.

The Deloitte survey highlights five key lessons of crisis management:

- **Don't wait until a crisis hits to get ready** – early warning through monitoring of key risk indicators and



activities like crisis simulations to assess readiness to respond are key elements of good crisis management.

- **Every decision during a major crisis can affect stakeholder value** – recognise this and make sure the right people are involved in the decision-making process
- **Timeliness is everything** – response times should be in minutes, not hours or days, so getting a team mobilised to handle the situation is paramount. Also, recognise that outside the box and innovative thinking can be a key in this type of situation, so keep that in mind when choosing response team members.
- **You can emerge stronger** – crises often create opportunities, so be on the lookout for them so you can take advantage of what they may offer.
- **When a crisis seems like it's over, it's not** – whether it's legal implications, insurance claims or having evidence on hand to deal with the media, there is inevitably scrutiny following a crisis. As such, the importance of data capture and logging of actions during a crisis and afterward cannot be underestimated if you want to keep the recovery on track.

#### **Scenario**

To demonstrate some of these principles outlined, let us expand on one of the examples mentioned earlier. An interruption in supply of raw ingredients due to strike action by dockside workers has the potential to hold up production and supply of a key product. Some key considerations would include:

- **Stakeholder management** – understand the significance of the product line i.e. whether lack of availability could significantly impact the company in terms of bad press or damaging customer relations
- **Monitoring** – if logistics through shipping ports has the potential to significantly disrupt business, how proactively is the organisation managing events like industrial action or tracking other factors that may influence availability like berthing congestion or weather events? Also, what is the public sentiment on social media and is the company keeping customers informed?
- **Mitigating actions** – what alternative strategies does the company have in place to reduce the impact of such an event? Examples would include alternative means/ routes

for transport, alternative suppliers in different regions, and higher levels of finished product on hand to provide a buffer against potential supply interruption.

- Has the crisis management team been activated? The crisis management team would have responsibility for activating alternate supply or logistics channels as well as helping manage communications with customers and the market to keep them informed of the situation, and providing reassurance that matters are under control.

In closing, managing reputation risk should be on the radar of senior management and the board, and

is there to stay for the foreseeable future. Keep in mind the following three principles to help protect your organisation's reputation and keep the trust of your customers and other stakeholders:

- Know your stakeholders and your risks, and the flow on effect on reputation
- Identify data sources to use as key risk indicators to help proactively monitor for potential events and provide early warning
- Be prepared – have a crisis management plan in place to allow you to respond quickly and effectively should an event occur. <sup>3</sup>

*The Deloitte 2014 Global survey on Reputation Risk referred to in this article is available for download at [www2.deloitte.com/au/ReputationRiskSurvey](http://www2.deloitte.com/au/ReputationRiskSurvey).*

*In addition, an interactive version is available from the same site which includes the ability to analyse results by major industry sectors and regions, as well as a five-question quiz, which compares responses provided to those of survey participants.*

*Liz Brown is a partner in the Risk Services team at Deloitte Australia with a focus on the consumer business industry segment. She provides consulting advice to clients on business and IT risk management.*

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# THE POWER OF INSIGHT

*Accurate demand planning is critical for success in today's consumer-driven business climate.*

Words by *Andy Walker and David Holmes*

Success in today's consumer-driven business climate depends on meeting customer demand as efficiently and profitably as possible. Accurate demand planning is vital; not only does it provide the very foundation on which future plans can be made but it allows the business to anticipate changes in demand in plenty of time and respond accordingly.

Statistical forecasting is an essential element in maturing the organisation's demand process, but crucially it needs to be part of a wider integrated approach to demand management, led and managed by those closest to the consumer, and embedded cross-functionally into the organisation. This means addressing people and processes first.

In many organisations, there is a tendency for an over-dependency on computer-generated forecasts. And without the intelligence, a forecast is just a number. Applying intelligence is vital, and the detail must be scrutinised and challenged.

Demand planning must be led and managed by the sales and marketing teams, who have the greatest understanding of what is happening at the point of consumption. Not only do they have the power to directly influence demand, they know what's happening in both the business and the outside world, so they are able to make sense of the data.

Based on algorithms, forecasting tools take elements of history to fit out a projection of the future. But history doesn't always repeat itself. Unless someone is managing the tool – correcting history to reflect real demand – the system will project incorrectly. For

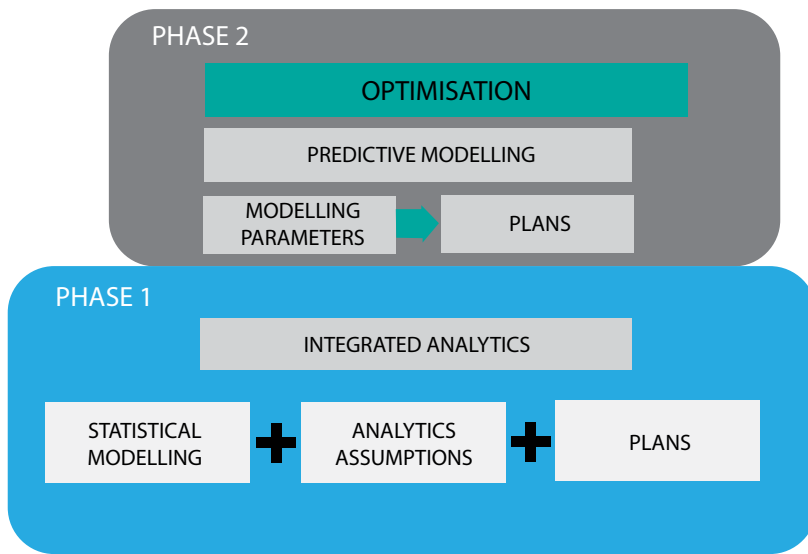


example, the figures may show a dip in the amount of product dispatched last month; but was this lack of shipment due to a fall in demand, or was there some other factor at play, such as a manufacturing fault or stock-out? Without applying the intelligence, you've just got a number in front of you.

Accurate statistical forecasting relies on making this history truthful.

What is the impact of new product introductions, seasonal variations, and promotions on demand? There are layers of complexity here too. For example, Christmas happens at the same time every year, but Easter doesn't. Take the computer's word for it, and you can find your autumn forecast three or four weeks out of kilter.

## Evolution of Marketing & Sales Planning



### Building an accurate statistical forecast

There are three basic strategies that can be applied for statistical forecasting: trends, seasonality and events-based forecasts. These each form a key starting point for the forward demand plan but need to be managed correctly.

**Trends:** A trend-based forecast is the tendency for data to increase fairly steadily over time. For organisations in a growth market, trend-based statistical forecasting can provide a good understanding of where demand is heading; up, down or flat.

But beware of oscillations in

demand caused by changes in the overall economic environment. While operating on the assumption that history is reflected in the future will work during times of stability, the recession highlighted the limitations and risks of this in dramatic fashion. The global financial crisis created an atypical situation where history was wiped out – the future no longer represents the past and vice versa.

And as the global economy continues to recover, statistical tools will not project organisations out of a recession. Unless intelligence is applied, they will assume the business will continue in decline. As businesses finally get their heads above water, there's no time to wait for tools to play catch-up; assumptions need to be managed now. Only then will organisations be able to accurately forecast and capture a larger share of the market as demand returns.

**Seasonality:** Seasonal events create regular fluctuations, which are repeated from year to year at about the same time, with the same level of intensity. Based on cyclical patterns of demand, where some periods of

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the year are higher or lower than others, this model is best suited for repeat events, such as Christmas and Valentine's Day.

However, it is important to remember to 'de-seasonalise' the data after an event to avoid incorrectly inferring the seasonal pattern will continue indefinitely. A beverage company client launched a hot chocolate business in Canada highly successfully but wondered why, six months later, it had a lot of excess inventory. Its statistical tool had picked up the high demand during launch and forecast it forward. In addition, while a lot of hot chocolate was being consumed in Canadian winter when it was minus 20 degrees outside, come the summer, hot chocolate wasn't everyone's beverage of choice.

Not 'de-seasonalising' the data and letting the statistical tool go unattended, as this company did, will inevitably result in a lot of wasted product. While it may seem obvious, it's surprising how many companies believe the number put in front of them without applying common sense.

Watch out for one-off promotions, which impact seasonality too. An ice-cream manufacturer may have its seasonal peaks around summer, but changing the terms of trade and offering a discount for those who pre-order before the season starts will, of course, alter demand. Sales and Marketing's input here is key, for they have the knowledge of one-off events, which can affect seasonality.

**Events:** A statistical model based on events refers to known circumstances, which result in high or low data points, outside of the typical 'expected' demand pattern. More often than not, the events will be specific to the particular business and industry – from promotional activities, close-out sales and special orders, to stock-outs, natural disasters, and special occasions.

One-time events need to be addressed and edited out of the history to prevent the forecast going askew. Take the London 2012 Olympics as



an extreme example; while the UK economy saw a £9.9 billion boost in trade and investment during the games, this would need managing in the forecast. Businesses cannot look forward to the demand heights provided by Olympic fever the following year or indeed, probably ever again.

Event-based statistical modelling works particularly well for food manufacturers. It is important to start with forecasting around the events themselves; create profiles for the shape and size of demand associated with them, and use these as the building blocks. These building blocks can then be scheduled in for when they're going to occur and, of course, for simultaneous events, they can be stacked one on top of the other. So, instead of projecting a straight line forward, the business builds an overall forward view.

It is vital to factor in the drop in sales that always follows an event. After a Buy-One-Get-One-Free promotion, for example, retailers will see a dip in sales, since consumers stock up for a couple of weeks and won't buy that product again until needed. Sales and Marketing may be quick to take the glory for the sales peak surrounding the promotion, but

the dip that follows can't be ignored. A statistical tool can help to analyse a two-week promotion over a six- to eight-week period, so the business can see exactly how well it has performed and exactly how to forecast similar events going forwards. However, it would be naive to assume that the event itself is the only factor at play.

While there is real power in linking demand variation to events, it's important to take the time to truly understand the demand drivers. Just because demand doubled during a Buy-One-Get-One-Free event, don't make assumptions. Some of the demand could have been driven by a competitor stock-out, for example, rather than the success of the promotion itself. There is huge value in the sales and marketing team undertaking post-event analysis to drive long-term demand improvement.

### Knowing its value

The value of a statistical forecasting tool is not the same for every business. For some organisations, where the market is stable, with little seasonal variety, statistical forecasting can be highly valuable. Indeed, for some large multinationals whose product portfolios are so large, a statistical tool is sometimes the only starting point.

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Conversely, for organisations where volatility is high, there is little or no value in a statistical forecast. For example, a large food manufacturer, which supplies major retailers, has just 20 per cent of its demand as base business, with 80 per cent driven by promotions. Unless it ran the same promotions for the same categories in the same weeks every year, and its competitors did too, statistical modelling would not be a valuable starting point.

In order to establish how, and to what extent, statistical forecasting should be used, the organisation needs to consider its own drivers in demand. It is critical to design models that are right for the individual company.

### **Statistical forecasting is an input**

Statistical forecasting provides an invaluable baseline from which to build an integrated demand plan, but it must always be regarded as an input to the demand plan, rather than an output of it.

At Oliver Wight, we use a maturity model to help organisations understand their level of capability and that of their supply chain partners. The model describes four phases of maturity for demand management and within phase one (where most organisations find themselves), there are three transitions organisations have to make on their way to the 'advanced' level (phase two); these transitions are 'basic', 'foundation' and 'capable'.

For those companies in phase one, the focus is gaining control; getting to grips with understanding the impact of the past, and anticipating future events. This is where statistical forecasting comes in, providing a vital building block to move the organisation forwards.

Organisations at this foundation level need to not only have the statistical models in place, but a good understanding of analytical assumptions and a firm grip on sales and marketing plans; it is this 'equation' that delivers a structured demand plan. However, a demand process that operates at this level will be relatively manual and heavily dependent on people's interpretation of the data.

It is only as a business moves to the top of phase one, maturing its processes and improving competencies to the 'capable' level, that analytics start to

become more integrated; demand analysts and insight teams, equipped with a true understanding of the cause and effect, can start using key analytics to make sound projections for the future, thus improving the accuracy of the demand plan. Once in phase two an organisation can then start to use systems tools for modelling parameters and predictive modelling. However, these models have to be tested and validated before they can be trusted; only then can the business begin optimising the demand plan to reveal the optimal marketing mix.

### **Integrating the process**

Having established its use and its role in the demand planning process, the key to making statistical forecasting a useful input lies in ensuring the process is embedded across the organisation. Far too often, failure to plan for demand variation is blamed on forecasting error, and the error itself used as a stick with which to beat Sales and Marketing. While knowledge from Sales and Marketing is essential, integrating forecasting with financial planning is equally important; but this is often overlooked and in many cases, forecasts are merely volume-only statistical processes.

Integrated business planning has become the process of choice for smarter organisations. Its review processes provide an effective forum to measure performance, highlight gaps, and drive continuous improvement. One of its key differentiators from traditional sales and operations planning is the financial integration it provides, allowing the business to operate with a single set of numbers.

This is fundamental. All stakeholders in the forecast must take an active role in reviewing and agreeing on the key inputs of the demand management process, including the accuracy of the statistical forecast. Of course, there will always be some errors in the forecast, but how this is managed is dependent upon the culture of the organisation. Getting to this single set of numbers, so the business operates with one agreed agenda for success, relies on establishing the principles of 'truth as we know it'.

This often involves a cultural change; breaking down functional silos and

creating an environment where people trust each other, and take accountability for their actions as well as ownership of the processes. To achieve this, it's essential to get the right balance of people and behaviours, processes and tools. All too often, processes and tools are addressed with vigour but people and behaviour not so.

Hitting the 'sweet spot' where these overlap is fundamental to effective change management. They must be addressed in the right order, too. Many organisations get this wrong – starting with processes and tools, and then trying to align its people behind them. It is in this scenario that the tools get blamed when things go badly. Businesses must instead start with people and behaviours (ie, knowledge) and then getting the right processes in place before the right tools can be specified and a reliable statistical forecast established.

### **Looking ahead**

While tools have become increasingly sophisticated, they can never provide the overriding output for effective demand planning. Without applying intelligence, data is just a number, and a potentially dangerous one at that. Forecasts must be based on real demand history, rather than just shipments, and any non-repeating historical events have to be edited out. When led by Sales and Marketing, and integrated across the organisation – with the correct models applied to suit the business, its products, and markets – statistical forecasting can provide a powerful baseline on which to create future plans. When used as part of an integrated demand management process, it can help anticipate changes in demand well in advance, so the business can respond accordingly, before it's too late. 📌

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# NUTRITION WATCH

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

Words by *Dr Ramon Hall*

## Ready-made meals may increase obesity risk

In a study conducted at the Centre de Recherche Public Santé in Luxembourg, in collaboration with the University of South Australia and the University of South Carolina, researchers investigated the association between consumption of ready-made meals and diet quality, and adiposity measures (Alkerwi *et al.*, 2015). The study involved a nationally representative sample of 1,352 participants, aged between 18-69 years who were participating in the nationwide Observation of Cardiovascular Risk Factors in Luxembourg (ORISCAV-LUX) survey.

Daily consumption of ready-made meals was calculated as: frequency of consumption X portion size X number of portions consumed. The sum of the daily consumption of 11 pre-packaged dishes included in the food frequency questionnaire (FFQ) represented the total daily consumption of ready-made meals (g/d) for each individual. Overall, approximately 97 per cent of participants reported daily consumption of ready-made meals.

The results reveal that compliance with national nutrient-based recommendations was considerably lower in participants who consumed greater than 70 g/d of ready-made meals (high consumers) than in those with lower intakes. Also, higher consumers of ready-made meals had significantly less chance of complying with national dietary recommendations with regard to most nutrients and were significantly less likely to achieve fruit and vegetable



intake goals and meat-poultry-fish and egg eating goals compared to low consumers. The increased consumption of ready-made meals was also found to be independently associated with abdominal obesity.

The authors concluded that, "Daily consumption of ready-made meals was found to be associated with higher energy intake and with poor compliance with national nutritional recommendations, and hence it could plausibly increase the risk of central obesity and fat deposition."

Interestingly, in a recently published study by Kaufer-Horwitz *et al.* (2015), it was found that patients visiting obesity clinics are aware of and understand appropriate dietary strategies for weight loss, but are unable to translate this into practice.

The authors suggest that treatment approaches should include tools to help patients implement their nutrition knowledge.

The survey results present an opportunity for the food industry to develop more ready-made meal choices that can help individuals maintain or lose weight, and help them meet dietary recommendations.

Alkerwi *et al.* (2015). "Consumption of ready-made meals and increased risk of obesity: findings from the Observation of Cardiovascular Risk Factors in Luxembourg" (ORISCAV-LUX) study. *British Journal of Nutrition*, published online ahead of print, (doi:10.1017/S0007114514003468).

Kaufer-Horwitz *et al.* (2015). "Knowledge of appropriate foods and beverages needed for weight loss and diet of patients in an Obesity Clinic." *European Journal of Clinical Nutrition*, 69, 68-72, (doi:10.1038/ejcn.2014.102).





### Dietary protein requirements for >65yo women may be higher than current recommendations

Researchers at the Hospital for Sick Children in Toronto have conducted a study to determine the protein requirements of free-living women over 65 years old using the indicator amino acid oxidation technique (Rafii *et al.*, 2015). The indicator amino acid oxidation technique measures the oxidation of a labelled tracer L-[1-<sup>13</sup>C] phenylalanine to <sup>13</sup>CO<sub>2</sub> in response to graded intakes of protein. The study involved 12 participants who consumed protein intakes from 0.2 to 2.0g per kg body weight per day. The diets were designed to provide 1.5 times the subjects resting energy expenditure and were calorie balanced. The protein was provided as an amino acid mixture

based on the egg protein pattern with the exception of phenylalanine and tyrosine, which were kept constant across protein intake amounts. Before beginning the trial, all participants were given a two-day lead in diet containing a set protein level of 1.0g per kg body weight per day. The mean protein requirement was calculated using a mixed-effects change-point regression analysis to F<sup>13</sup>CO<sub>2</sub> (label tracer oxidation in <sup>13</sup>CO<sub>2</sub> breath), which identified a breakpoint in the F<sup>13</sup>CO<sub>2</sub> in response to graded amounts of protein.

The study results indicate that the mean estimated average requirement (EAR) protein for women over 65 years is 0.96g per kg body weight per day and the upper 95 per cent CI (an approximation for the RDA) protein of women over 65 years is 1.29g per kg body weight per day.

The authors conclude that “these estimates of protein requirements for older women are higher than the current EAR and RDA based on nitrogen balance data, which is 0.66 and 0.80 g per kg of body weight per day, respectively.”

In a related editorial in the same journal edition, Professor Juan Marini questioned whether it is time to update

protein requirement recommendations, given the study and other related research suggests that basing protein requirement on nitrogen balance techniques may not be optimal for health and function.

Rafii *et al.*, (2015) “Dietary Protein Requirement of Female Adults >65 Years Determined by the Indicator Amino Acid Oxidation Technique Is Higher Than Current Recommendations”, *Journal of Nutrition*, published online ahead of print, (doi:10.3945/jn.114.197517).

Marini (2015). “Protein Requirements: Are We Ready for New Recommendations?” *Journal of Nutrition*, published online ahead of print, (doi:10.3945/jn.114.203935).

### Dairy intakes are linked with brain glutathione concentrations

A study team from the University of Kansas has investigated the potential link between dairy food consumption and cerebral glutathione concentrations in older adults. It is known that a reduction in antioxidants such as glutathione has been observed in brain tissue undergoing oxidation stress during ageing and neurodegeneration (Chio *et al.*, 2015).

This observational study measured the cerebral glutathione levels in 60 healthy individuals with a mean age of 68.7 ± 6.2 years with a varied dairy food intake. Glutathione levels

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were measured using a non-invasive technique involving magnetic resonance chemical shift imaging techniques and compared these with dairy food intakes reported in seven-day food records.

The results showed that glutathione concentrations in the frontal, parietal and frontoparietal regions of the brain were correlated with average daily dairy servings. Glutathione concentrations were positively correlated with milk servings ( $P \leq 0.013$ ) and also cheese servings and calcium intakes were positively associated with parietal region concentrations of glutathione ( $P \leq 0.015$ ;  $P \leq 0.039$ ) respectively.

The authors conclude “higher cerebral glutathione concentrations were associated with greater dairy consumption in older adults. One possible explanation for this association is that dairy foods may serve as a good source of substrates for glutathione synthesis in the human brain.”

In an editorial related to the this article, Professor Peter Jones (2015) suggests that this study highlights a new benefit of consuming milk for older people serves as a starting point to explore the size and the etiology of the effect.

Choi *et al.*, (2015). “Dairy intake is associated with brain glutathione concentration in older adults.” *American Journal of Clinical Nutrition*, published online ahead of print, (doi: 10.3945/ajcn.114.096701).

Jones, (2015). “New health benefit of dairy products.” *American Journal of Clinical Nutrition*, published online ahead of print, (doi: 10.3945/ajcn.114.103549).

## **Aeration of beverages shown to increase gastric volume and reduce appetite**

Researchers from the University of Nottingham, United Kingdom, have investigated whether aerated drinks (foams) of differing gastric stability would increase gastric distension and reduce appetite compared to standard drinks (Murray *et al.*, 2015). This study was a randomised controlled cross-over trial involving 18 healthy males. They consumed three test products that were skim milk based and all 110 kcal. Two of the drinks were aerated to foams by whipping (to 490 mL) and

one product was a stable foam in the stomach (stable foam) and another had a less stable foam (less stable foam). The third beverage was a non-aerated drink (liquid control) which was 140 mL. The stable foam variant was achieved through the addition of xanthan gum which was not added to the less stable foam product, but was added to the liquid control product. The stomach contents were imaged over four hours using magnetic resonance imaging (MRI) and self-reported appetite ratings. Area under the curve for appetite rating and time to return to baseline appetite were measured.

The results reveal that both foams significantly increased gastric volumes and reduced hunger when compared to the liquid control product ( $P < 0.001$ ). Also, the stable foam product further produced a significantly slower decrease in the total gastric content ( $P < 0.05$ ) and foam volume ( $P < 0.001$ ) compared to the less stable foam product. There was also a notable significant longer time to return to baseline in appetite measures for the stable foam compared to the less stable foam product (248 min compared to 197 min respectively;  $P < 0.05$ ).

The authors concluded that “appetite suppression induced by foams could largely be explained by effects on gastric volumes and emptying, which may be further enhanced by foam stability”.

These results should be of interest to beverage manufacturers looking to make healthier products pitched at the weight management market segment.

Murray *et al.*, (2015). “Aerated drinks increase gastric volume and reduce appetite as assessed by MRI: a randomized, balanced, crossover trial.” *American Journal of Clinical Nutrition*, published online ahead of print, (doi: 10.3945/ajcn.114.096974).

## **Excess energy as protein stimulates energy expenditure**

A research team from the Pennington Biomedical Research Center, Baton Rouge, Louisiana, USA, has undertaken an experiment to quantify the effects of excess energy from fat or protein on energy expenditure in men and

women living in a metabolic chamber (Bray *et al.*, 2015). Using a randomised controlled trial design, this study involved 25 participants who were required to eat ~40 per cent excess energy for 56 days from different protein level diets: 5, 15 or 25 per cent protein of total energy. Twenty four hour energy expenditure and sleeping energy expenditure were measured on days 1, 14 and 56 of overfeeding and also on day 57 when consuming their baseline diet. Metabolic and markers of muscle metabolism were measured in skeletal muscle biopsy samples.

The study showed that individuals in the low-protein group whose excess energy was fat, both 24h energy expenditure and sleep energy expenditure did not in the first day of overfeeding. However, when the extra energy contained protein both 24-hour energy expenditure and sleep energy expenditure significantly increased ( $P = 0.02$ ). Overall, during the eight weeks 24-hour energy expenditure was correlated with protein intake ( $r = 0.60$ ,  $P = 0.004$ ) but not energy intake ( $r = 0.16$ ,  $P = 0.70$ ).

The authors conclude that, “Excess energy, as fat, does not acutely increase 24-hour energy expenditure, which rises slowly as body weight increases. Excess energy as protein acutely stimulates 24-hour energy expenditure and sleep energy expenditure. The strongest relation with change in 24-hour energy expenditure was the change in energy expenditure in tissue other than muscle or fat-free mass.” This study should be of interest to manufacturers of products looking to help individuals with maintaining a healthy body weight. 🍌

Bray *et al.*, (2015) “Effect of protein overfeeding on energy expenditure measured in a metabolic chamber.” *American Journal of Clinical Nutrition*, published online ahead of print, (doi: 10.3945/ajcn.114.091769).

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



# 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

## Mental imagery as an olfactory training strategy

An extremely important component of descriptive analysis is training panellists to achieve consistent results. The effectiveness of mental imagery as a training strategy has been shown in several areas such as sport and music. In this study, researchers from the University of Bordeaux in France assessed if olfactory mental imagery could be a tool for training the olfactory capacities of panellists.

Novices, undergraduate enology students (intermediates) and wine experts were asked to repeatedly imagine the visual images or smells of odourant sources presented in picture form. Olfactory abilities, odour sensitivity and identification performance were compared before and after mental training to check the differential effects of the two types of sensory training. They demonstrated that, like repeated objective odourant stimulations, repeated imagination of odours was able to enhance olfactory performance in objective perception. Both odour detection and identification abilities were improved. However, according to the results: (1) the effect was odourant specific; and (2) the impact of training on identification was restricted to wine experts.

The authors identified practical applications and suggested olfactory mental imagery as an excellent tool for training the olfactory capacities of panellists. This technique could be extended to perfumers, flavourists and tasting panellists with a view to

improving product quality control, without material stimulus such as chemical supports. Given the variable results achieved, an unbiased conclusion would state this may be a useful addition to traditional training.

Tempere S *et al.*, (2014). "Learning Odors: The Impact of Visual and Olfactory Mental Imagery Training on Odor Perception." *Journal of Sensory Studies* 29 page 435-449



## A spoonful of sugar helps the medicine go down

We learn by experience that adding sugar to coffee makes it sweeter, and for some people increases pleasantness. This strategy has implications for the pharmaceutical industry, especially

for drugs that are administered in liquid form oral dose, such as many paediatric drugs. Julie Mennella and colleagues from Monell Chemical Senses Center in Philadelphia, USA, used a group of children and adults to determine whether adding sucrose to a number of bitter compounds, including caffeine, would reduce their bitterness, increase pleasantness or both.

The results showed that sucrose suppressed bitterness to different extents for each particular bitter compound, but for some bitter agents the effect of sucrose was marked; for instance, it substantially lowered bitterness ratings for caffeine. One important aspect this type of research highlights is the large individual variation in experiences – three children and two adults could not complete testing because they were nauseated after the tasting. Yet for other people, sucrose was an unequivocally effective masker of bitter taste. This is an obvious case of a strategy working effectively for some people, and less effectively for others. As the authors note, "Given the numerous and varied components of involved in the mediation of bitter taste and the age-related changes in bitter perception, the task ahead of us is challenging but remains an important public health priority that has the potential for major impacts on the health of our children."

Mennella J *et al.*, (2015) "A spoonful of sugar helps the medicine go down. Bitter masking by sucrose among children and adults." *Chemical Senses* 40 page 17-25

### Bad breath and olfactory dysfunction

Halitosis, also called bad breath, is a symptom in which a conspicuously offensive and unpleasant odour is present in the exhaled breath. Volatile sulphur compounds are usually involved, often as a result of bacteria or infection in the oral cavity or upper respiratory tract. This study investigated whether people who had chronically bad breath also had impaired sense of smell. To keep it brief, those subjects who had bad breath also had a poor sense of smell. We suppose the bad sense of smell is an evolutionary advantage.

Altundag A, *et al.*, (2015). "The evaluation of olfactory function in individuals with chronic halitosis." *Chemical Senses* 40 page 47-51

### Taste with our eyes

We taste and eat with our eyes – a five-year-old knows this but as sensory scientists we want to see some proof and some experimental results. A recent review by Capaldi from the Arizona State University, USA, gives an insight into the power of visual cues and the associated science behind the effect, ranging from the colour of food and portion size, to shape.

Did you know that simply arranging food on our plates in a neat way (rather than a messy way) can increase food consumption? The sight of food can already start a physiological response, which prepares you for the food that you are about to eat and increases your appetite. All these are physiological processes in response to a visual cue of certain foods. Blood insulin increases just by looking and smelling food, without actually eating the food. The body knows what to expect and prepares itself for what is about to happen.

Serving larger portions will increase intake. The amount of food we consume is informed by how much we think we have eaten based on visual cues. For example, by just looking at the number of left over bones of the chicken wings you consumed,



you may decide it is time to stop eating. However, when these cues are distorted by providing bigger plates, or removing the leftover bones from our plates, we lose track of what we consumed and start to consume more.

Another important visual cue is colour. The colour of food has long been a subject of research. You might have experienced eating food which has been stripped from its colour. For example, colourless cola. Often it is very difficult to correctly identify the flavour of the food, without the colour cue being present. Colour intensity can increase perceived flavour intensity. For example, dark-coloured milk chocolate is perceived as more chocolatey than the same chocolate with a lighter colour. Colours that match the flavour (eg. red for cherry flavour) can increase perceived flavour intensity and overall acceptability of food.

However, the way particular cues influence our taste perception and food intake depends on our experience. This experience is closely related to our food environment. For people who have never eaten dark chocolate, a "dark-chocolate" colour cue would have little influence on how this chocolate is perceived. For future research it is

therefore important to investigate the influence of visual cues in cross cultural studies. This is especially of importance when Australian products are shipped to overseas markets such as China.

Wadhera D, Capaldi-Phillips E. (2014). "A review of visual cues associated with food on food acceptance and consumption." *Eating behaviors*, 15, page 132-143

### Seeing is not eating

In many countries, a meal usually consists of a number of different foods served on one plate. The liking of these separate foods differ – for example, a combination of a well-liked lasagne and a moderate-liked salad. It is possible that the hedonic value of one food affects the liking of other food within a meal. Attractive foods may increase the liking of other foods (i.e., assimilation), or decrease the liking of other food (ie., contrast). Imagine you take a sip of a moderate-liked juice after drinking a delicious juice. The moderate-liked juice will be more disliked after the delicious juice than when presented alone; a well-studied example of contrast effect. Contrast and assimilation effects were previously studied in comparing foods of the same kind, but not for different foods within a meal.

Researchers of the Montclair State University together with Natick Soldier Research in the USA studied how a side dish affected the liking of the main food-item: chicken tender. The well-liked side dishes consisted of potato chips and macaroni and cheese, and the disliked side dishes consisted of lima beans and beets. Sixty-four participants viewed two photographs with plates that consisted chicken tender served with either the well-liked or disliked side dishes. The whole meal was judged as more attractive with the well-liked side dishes and less attractive with the disliked side dishes. However, the tender alone was equally liked. After that, the researchers let the same participants consume the chicken tender with either the well-liked or disliked side dishes. Unlike the first experiment, the tender was more liked in combination with the disliked beans and beets, and less liked in combination with the well-liked potato chips and macaroni and cheese.

It appears that eating a meal, rather than just viewing it, results in different effects on hedonic judgements of foods within a meal. Adding well-liked foods to a meal may lead to a greater overall visual attractiveness, whereas actually tasting the food may increase the hedonic contrast of the well-liked and less-liked foods.

Jimenez A *et al.*, (2015). "Seeing a meal is not eating it: Hedonic context effects differ for visually presented and actually eaten foods." *Food Quality and Preference* 41 page 96-102

### Mathematical modelling and olive oil

In order to combat the growing trend of adulterated or falsely labelled olive oils, researchers in Madrid, Spain, have developed a method through which differences between extra virgin olive oil (EVOO), virgin olive oil (VOO), ordinary virgin olive oil (OVOO), and 'lampante' olive oil (LOO, natural olive oil not fit for consumption) can be detected. To do so, they used the combination of a sensory panel and the measurement of six chemical parameters of 220 olive oil samples, and then applied nonlinear mathematical modelling known as artificial neural networks (ANNs), which allow for the

discovery of "nonlinear trends that exist between variables."

The sensory panel were asked to evaluate the olive oils based on attributes considered desirable (green, ripe and bitter) and related to defects (earthy, vinegar-like and muddy). They were also asked to grade the oils as EVOO or other.

Six chemical parameters were also measured in each oil; free fatty acid content (FFA, related to the acidity of the oils), peroxide value (PV, a measure of oxidation), two UV absorption parameters (K232 and K268), 1,2-diacylglycerol (DAG) content (a component found in a range of 1-3 per cent in virgin olive oils), and pyropheophytin content (PPP, a degradation product of chlorophyll which is found in olive oils that have undergone thermal or age related degradation).

ANNs were then used to link the results from both the chemical analyses and sensory evaluation, and through the identification of various relationships, were able to correctly classify (on average) 96 per cent of olive oils. The researchers did note that while the ANNs used have been successful in other food- and chemistry-related scenarios, the particular modelling may not be as successful when looking at samples different to those used in this study. [6](#)

Cancilla JC *et al.*, (2014). "Linking Chemical Parameters to Sensory Panel Results through Neural Networks to Distinguish Olive Oil Quality." *Journal of Agricultural and Food Chemistry* 62: 10661-10665.

*Drs Russell Keast, Gie Liem, Megan Thornton and Dieuwerke Bolhuis are members of the Centre of Advances Sensory Science (CASS) at Deakin University, Victoria.*



# WE'RE HEADING FOR A MELON & CAPSICUM REVOLUTION

*A new harvesting technique could transform Australian supermarket fruit and vegetable shelves.*

Canary, galia and charentais melons – they're not as well known in Australia as the traditional rock or honeydew melon but thanks to a new growing technique, this could be about to change. Researchers in North Queensland have more than doubled the traditional yield of specialty melons and capsicums during trials of a new production technique that uses low-cost greenhouses and vertical plant trellis systems.

With outdoor crops such as melons and capsicums traditionally growing along the ground or on small plants, researchers from the Department of Agriculture, Fisheries and Forestry say alternative growing techniques adapted from overseas have translated well in Australia's warm climate, and could create more variety in fresh produce for Australian consumers.

Known as protective cropping, researchers found that trellising the plants vertically inside greenhouses and specific shoot pruning resulted in the plants increasing their fruit set, and the length of time they could be harvested compared to traditional outdoor crops.

Researchers also found that melon yields could considerably increase, with the plants trained to grow upwards rather than outwards, resulting in a significantly smaller growing area. Protective cropping also resulted in a variety of different coloured and shaped capsicums that could be grown over longer periods when protected from less than optimal environments.

Horticulturalist and project leader Dr Elio Jovicich explains that growing specialty melons and capsicums without protective cropping has proven difficult in the past thanks to inconsistent weather conditions, pests and diseases. He hopes the new technique will not only improve the fruit quality but also significantly increase yields and allow for almost year-round production.

"While several growers in North Queensland have started exploring the potential of growing a greater variety of melon types, yield have been unsuccessful without the use of protective cropping," says Dr Jovicich.

"The use of protective cropping has a high potential for improving fruit quality, increasing yield per square metre, minimising crop failure due to erratic unfavourable weather events, allowing for off-season production and supplying niche markets in the Australian melon and capsicum markets."

While the protective cropping method is a more expensive means of production per unit compared to traditional field crops, Dr Jovicich explains that it is important that low-cost production systems for the tropics include structure designs and growing practices that are specific for warm environments. At the same time, crop and cultivars are carefully selected based on a particular market.

"There are low-cost and effective systems available for warm environments that can moderate extremes of our variable climatic conditions and lead to high yields; these could include high passively ventilated structures and retractable roof structures," he says.

"When compared to common yields in the open field, these early trials using low-cost systems have led to marketable yields of up to 2.6 times greater for melons and six times greater for capsicums.

"With melons, we have seen two to four high quality melon fruits per plant using protective cropping, giving yields up to 8 kg/m<sup>2</sup>."

In addition to specialty melons and capsicums, the project includes research on specialty cucumbers and eggplants with encouraging early results. Dr Jovicich says his project team will continue to investigate and develop cost-effective protective cropping systems for vegetable growers in warm environments over the coming years.

The project is part of the Pacific Agribusiness Research for Development Initiative with funding from DAFF and the Australian Centre for International Agricultural Research. 



DIARY

### AUSTRALIA & NEW ZEALAND 2015

**February 16-18** Australian Dairy Conference. Launceston, Tasmania. [www.australiandairyconference.com.au](http://www.australiandairyconference.com.au)

**February 17-19** IJFST 50th Celebration Conference: The future of food innovation, nutrition and technology. Lincoln, New Zealand. [www.lincoln.ac.nz](http://www.lincoln.ac.nz)

**February 27-March 15** Melbourne Food & Wine Festival. Melbourne, Victoria. [www.melbournefoodandwine.com.au](http://www.melbournefoodandwine.com.au)

**March 13** ILSI Symposium. *Mind the Gap – Nutrition Under the Microscope*. Holiday Inn Sydney Airport, NSW. [www.ilsig.org](http://www.ilsig.org)

**May 1-3** The Food Show. Horncastle Arena, Christchurch, New Zealand. [www.foodshow.co.nz](http://www.foodshow.co.nz)

**May 2-3** Fifth Science of Nutrition in Medicine and Healthcare Conference. *Nutrition in Medicine*. Melbourne, Victoria. [www.nutritionmedicine.org.au](http://www.nutritionmedicine.org.au)

**June 25-27** AUSVEG National Convention, Trade Show and Awards for Excellence. Jupiters, Gold Coast, Queensland. [www.ausveg.com.au](http://www.ausveg.com.au)

**August 11-13** 48th Annual AIFST Convention and 15th Australian Food Microbiology Conference. *Food For All*. Luna Park, Sydney, NSW. [www.aifst.asn.au](http://www.aifst.asn.au)

### INTERNATIONAL 2015

**March 2-3** 13th Annual Global Food Technology & Innovation Summit. *Inspiring the next generation of global food and beverage innovation*. London, United Kingdom. [www.foodinnovate.com](http://www.foodinnovate.com)

**March 18-20** Food Vision. *Connecting leaders in nutrition and food and drink development*. Cannes, France. [www.foodvisionevent.com](http://www.foodvisionevent.com)

**June 11-13** Food Tech. *Fifth international F&B machinery, packaging & service solution exhibition*. Kuala Lumpur Convention Centre, Kuala Lumpur, Malaysia. [www.foodtech.merebo.com](http://www.foodtech.merebo.com)

**July 11-14** Institute of Food Technologists Annual Conference. *Where science feeds innovations*. Chicago, USA. [www.am-fe.ift.org](http://www.am-fe.ift.org)

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

**November 17-19** Food Matters Live. ExCeL Exhibition and Convention Centre, London, United Kingdom. [www.foodmattersglobal.com](http://www.foodmattersglobal.com)

**November 18-20** Sweets & Snacks China. China National Convention Center, Beijing, China. [www.sweets-snackschina.com](http://www.sweets-snackschina.com)



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