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JUNE - AUGUST 2019

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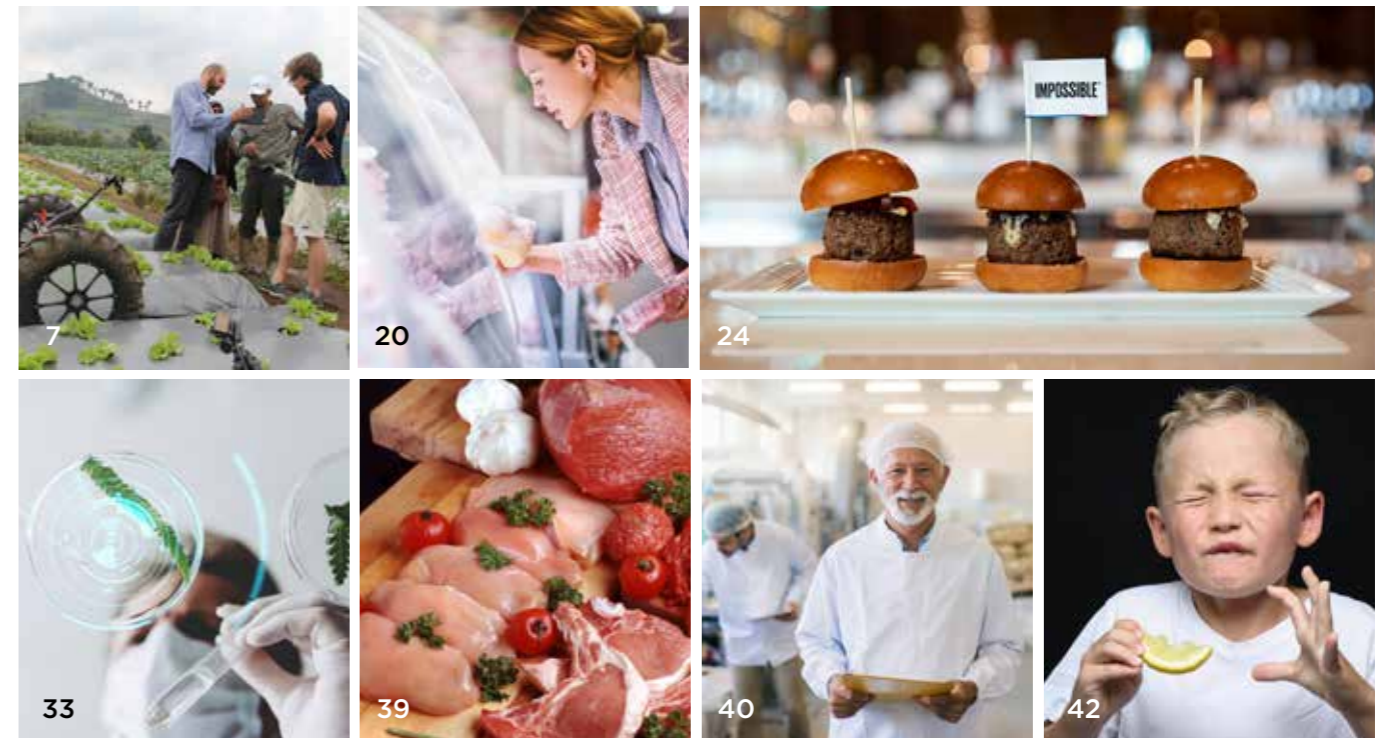
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June - August 2019



FEATURES

- 20 The Health Star Rating: Where To From Here? [Part I]**
The ins and outs of the Health Star Rating
- 24 Meat Re-Imagined: Alternative Proteins And What They Mean for Australia**
The increasing rise of alternative meats
- 28 The Power of Food to Influence the Future Through Better Health & Nutrition**
How health and sustainability are driving transformation in the food industry
- 30 Ensuring the Future of Food is Safe**
The need to produce increasing amounts of safe food with a reduced environmental impact
- 36 Food Technology Disruption - What's Next?**
Can novel products compete with conventional production systems?
- 42 Sensory: Food Files**
Latest research from around the globe

REGULARS

- 05** By The Numbers
- 06** The Pulse
- 14** People
- 18** AIFST
- 46** Fast Five
- 47** Diary



COVER
Feeding the Future.

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Food for Thought

Welcome to the Winter edition of *food australia*. We have been working hard with the AIFST Publications Committee and our editors, Bite Communications, to bring you another informative and thought provoking issue.

There are continuing and growing changes in consumer demand and food trends that impact the food industry and those who work in it, including:

- a desire for healthier, 'clean' and natural food and beverage products
- dietary restrictions and preferences such as gluten-free, non-dairy and allergen-free foods
- the desire to know where food and beverages have come from
- the preference for ethical practices in food and beverage production
- a desire to reduce the carbon footprint and environmental effects of food production, and
- a desire to reduce or manage waste, including food waste and packaging.

These trends will continue to influence and challenge our industry into the future and have influenced the program for the 2019 AIFST Convention, our flagship event, in Sydney on 1-2 July at the International Convention Centre. The theme for the convention this year is "Feeding the Future: Challenges & Opportunities". This edition of *food australia* picks up this theme and includes features from some of the convention speakers.

In this third edition of *food australia* for 2019 we look at the power of food to influence the future. We also feature a piece on the Health Star Rating system and ask - where to from here? There's lots to get you thinking about future challenges and opportunities.

I would like to acknowledge and thank all of the companies and organisations who support the AIFST both at our convention and at events during the year - they cover the breadth of the industry and we recognise their commitment to both the Institute and the industry here in Australia.

And finally, as always, I encourage all members to take an active role in engaging in the Institute.



Fiona Fleming

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Size of the Prize Analysis for Australia

A recent study undertaken by Food Innovation Australia Limited (FIAL) highlights the need for Australian producers to take advantage of the growing global protein market.

Found in a wide spectrum of foods, and increasingly recognised by consumers as a critical source of nutrition, the presence and role of protein in food markets across the world is becoming more significant.

Indeed, many consumers are increasingly basing their food purchasing decisions on the nutritional value of products, with a recent survey finding 58 per cent of consumers purchase food products based on their protein content. This implies that, to capture their hearts (and wallets), food businesses and marketing strategies must keep up-to-date with the latest trends on health and nutrition.

This study undertakes a first-of-its-kind in-depth analysis of 50 protein types in 11 regional markets to help Australian food and agribusinesses shed light on the major demand and supply trends of global protein consumption. The aim of the study is to trigger a national call to action for industry to adopt new thinking around protein and help position Australia as a leading supplier of the world's proteins.

This approach will strengthen the overall competitiveness of the country's food and agribusiness industry and provide greater long-term returns to growers and producers.

Global protein consumption

INCREASED 40%

between 2000 and 2018

>50%

of this increase was driven by Asia

Indonesia and Sub-Saharan Africa are forecast to see the highest protein demand growth rates of

UP TO

3.6%

per year between 2018 and 2025

Globally, each person was estimated to

CONSUME 26kg

of protein per year on average in 2018.

Fuelled by the growth of the consuming class, this is projected to **grow by 27% to 33kg** in 2025

In 2018, plant-based proteins accounted for

66%

of global protein consumption supply, and is likely to remain as the dominant source of supply in 2025

China is projected to be the largest market across all protein categories, except plant-based proteins. China alone could account for

35%

of global protein market value in 2025

Shifting Australia's protein production mix to match projected global consumption for **HIGH-VALUE PROTEINS** could create an additional

AU\$55 BILLION

in 2025

In value terms, the global protein market could be worth up to

AU\$513 BILLION

in 2025,

40%

of which could come from meat proteins

IMPLICATIONS FOR AUSTRALIAN PRODUCERS

Strengthening partnerships in high-potential markets by taking advantage of existing free trade agreements and forming commercial collaborations.

Deepen collaborations across players in the value chain to harness business opportunities beyond food production.

Head to FIAL's website to read the full report https://fial.com.au/Protein_Report_2019

Coopers Brewery's Malting Plant Named Best in the World

Coopers Brewery's new Adelaide malting plant has been named equal best maltster in the world at the World Barley, Malt and Beer Conference, held at the Palace of Culture and Science in Warsaw.

The award was handed down by an international jury drawn from members of the global brewing supply chain, jointly to Coopers and The Swaen in the Netherlands.

The prestigious Global Brewing Supply Awards are held every two years to recognise the brewing world's business innovation and technology leaders.

Coopers' Maltings Manager, Dr Doug Stewart said the plant includes "unique in-house designed features which have allowed us to reduce steeping times, water usage and kiln-gas during the malting process".

Coopers opened its 54,000-tonne maltings in November 2017, producing its first batch of malt that same month.



Monash University launches Monash Food Innovation

Monash Food Innovation Centre is now fully embedded within Monash University and has a new focus and a new name - Monash Food Innovation.

The launch of Monash Food Innovation by Monash University signals an expansion of the Monash Food Innovation Centre, with a renewed commitment to bring together the university's interdisciplinary capabilities to consider

and resolve global challenges in food and agribusiness.

MFI will continue to engage with food and agri-business network partners to deliver impact across a broader scope of projects and initiatives including:

- Providing access to food innovation services and support to explore and validate food-related product or service offerings from

- concept stage to market execution with network partners
- Working with industry and farmers to transform food waste into profit by researching the potential opportunity and market value of food by-products
- Helping the dairy and food industries explore the next frontiers in the manufacturing of new products, efficient distribution and sustainable resource use via the Monash-led Food and Dairy Graduate Research Interdisciplinary Program (GRIP).

Some of Monash Food Innovation Centre's 2018 highlights include engaging 4,514 businesses from manufacturing, consultancy, government, primary suppliers and retail, from start-up level through to large multinational organisations; undertaking 76 food innovation projects on accelerating innovation pathways to market; engaging 353 businesses with China and the Chinese National Cereals, Oils and Foodstuffs Corporation (COFCO) to develop an export pathway into China; and supporting 161 food-focused start-up entrepreneurs for scale-up.

Annual Rabobank Food Waste Report



The recently released annual Rabobank Food Waste Report reveals early indications of a changing tide when it comes to food waste, but shows there's still a long way to go.

The Report is part of the bank's annual Financial Health Barometer and surveyed 2,300 financial decision makers between the ages 18 and 65.

Highlights from the Report tell us that Australians have significantly reduced their waste year-on-year by seven per cent, which is equivalent to reducing food wastage by \$700 million on the previous year.

Despite this improvement, government data shows Australians still wasted a total of \$8.9 billion of

food in 2018. That's a total average of \$890 per household or 298kg per person.

According to the Report, millennials (Gen Y and Gen Z) are the biggest food wastage culprits and city dwellers waste more than their rural counterparts. This is despite the fact that Gen Y and Gen Z are significantly more willing than their older counterparts to pay more for food that is produced in environmentally sustainable ways and is humane or organic.

Food going off before it can be finished was the main attributable cause of food waste (75 per cent), followed by consumers buying too much when shopping (45 per cent) and insufficient meal planning (34 per cent).

Looking globally, the Food Sustainability Index still ranks Australia as the world's fourth highest food waster per capita.

Robots Set to Work on Australia's Farms

Field robotics startup Agerris has made a move into the agtech scene, securing \$6.5 million in seed funding to commercialise its automated farm equipment.

Agerris, born out of University of Sydney research, develops robotic systems featuring AI and decision mapping to help farmers with labour-intensive farm tasks, from weeding and spraying to harvesting and picking fruit.

The funding comes from research commercialisation fund Uniseed and venture capital firms Carthona Capital and BridgeLane Group, and coincides with Agerris moving from its startup phase to incorporation as a fully-fledged business.

Agerris founder and chief executive Salah Sukkarieh said "many growers are asking for on farm technology



that can help with labour as well as intelligence gathering for aspects such as crop growth and pests. The solutions Agerris is providing help on both fronts as a combination of robotics technology that can do

automated weeding and spraying, as well as AI techniques that provide valuable information to the growers."

The funding will be used to grow Agerris from prototype level into high-scale operation.

Is it Time for a Grain Revolution?

By Director of the Functional Grains Centre, Professor Chris Blanchard.

Grain-based foods have been given a 'hard time' lately. Wheat gluten is being unfairly blamed for a range of medical conditions while grains have also been criticised for their high levels of 'evil' carbohydrates. However, the tide of public perception may be turning as people become more aware of the benefits of eating grains.

Grains are increasingly being recognised as an important dietary source of protein and scientists at the Australian Research Centre (ARC) Industrial Transformation Centre for Functional Grains (FGC) are undertaking research that will provide further evidence of the benefits of eating them.

Researchers at the FGC, based at Charles Sturt University, are investigating the health promoting properties of minor components found in grains. They have shown an association between levels of

certain phenolic compounds and the potential health promoting properties of grains both in lab-based experiments and clinical trials. These compounds are particularly high in some of the brightly coloured grains paving the way for a growing interest in consuming these types of grains.

Consumers are now seeking food products that will deliver health benefits and the work that FGC researchers are doing in collaboration with plant breeders will result in grain varieties with enhanced health benefits. In a collaborative project with AGT Breeding, the potential allergenicity of wheat varieties released over the past 150 years was assessed. There has been a popular belief that the allergenicity had increased in recent years but FGC research has found the opposite trend. We now have tool that breeding companies can use to screen new varieties for their potential allergenicity levels.

FGC researchers, in collaboration with the NSW Department of Primary

Industries, have also developed a method for screening the digestibility of new rice varieties. This will assist in the development of new low-GI rice varieties, currently being demanded by international customers.

Increasing the health benefits of grain through processing has also been a focus at the FGC. Researchers are working with food processors including SunRice, Woods Foods and Uncle Toby's to develop grain based foods with enhanced health properties. These include high protein, pulse-based breakfast cereals and low-GI rice products.

It is important that plant breeders and food processors continue to develop grain-based varieties and foods with enhanced health properties to meet the growing demand from consumers. The research that the FGC is undertaking is contributing to the revolution that will see grains rise as a popular food choice again.



Widespread bans on single-use plastics, the implementation of China's "National Sword" policy and increasing media attention around the environmental consequences of plastic pollution on wildlife and seafood supply, have all made 2018 a tipping point for the plastic packaging industry.

Innova Market Insights has reported strong average annual growth in food and beverage launches with an ethical packaging claim each year from 2014 to 2018. Latin America led with 33 per cent of food and beverage launches claiming to have ethical packaging, followed by North America at 19 per cent and Europe at 10 per cent.

Paper-based and hybrid plastic alternatives are on the rise, with 40 per cent growth reported in new food launches with paper-based packaging (2018 vs. 2014).

Innova notes, however, that convenience remains key. The number of food and beverage launches with a reclosable or resealable closure has risen exponentially, with an average annual growth rate of 92 per cent in the past three years (2016-2018).

"In order to achieve the ambitious circular economy and sustainability goals set forth by governing bodies and businesses alike, an alliance between food manufacturers,

packaging suppliers and waste management agencies is paramount to packaging design in the food and beverage industry in 2019", according to Innova Market Insights.

The Innova Market Insights top five packaging trends are:

- 1. Recyclable by Design:** in order to boost recycling rates and achieve some of the ambitious goals set by various governments, close collaboration between businesses and the recycling agencies is vital.
- 2. E-Commerce Ready:** with more and more consumers shopping online, the landscape for online retail is rapidly changing.
- 3. Nature's Appeal:** anti-plastic sentiment and the rising demand for designed-in recyclability have fuelled a resurgence in paper and paperboard packaging.
- 4. More Convenient Convenience:** consumer convenience continues to be one of the most important attributes to consider when designing the optimal packaging for a product.
- 5. Pack to the Future:** with increasing consumer demand for transparency along the supply chain, IoT technologies such as QR codes and blockchain have come to the forefront.

New Seeds of Change accelerator launched by Mars

Mars Food Australia has launched its new *Seeds of Change* Accelerator in partnership with Food Innovation Australia Limited (FIAL), designed to fast-track growth of innovative food-focused businesses.

Six Australian-based start-ups will be selected to undertake a tailored four-month program to help tackle their individual challenges, supported with a grant of up to \$40,000 each.

The program will include face-to-face workshops and access to a panel of expert mentors and advisers. The Accelerator is looking for start-ups with a focus on one or more of the following areas: Sharing World Flavours, Easy-Meal Solutions, Responsible Food, Creating with Care, Better for You, Plant-Based Eating, Accessing Asia, Food Manufacturing and Value Chain Transformation.

"Mars Food is committed to nurturing the next generation of food innovators and dedicated to creating and delivering healthier, easier and tastier food for more people," Peter Crane, research and development director at Mars Food Australia and program mentor said.

The Australian *Seeds of Change* Accelerator is part of a joint US-Australia initiative. Applications can be submitted via the *Seeds of Change* Accelerator website from Tuesday 28 May and close on Friday 19 July.

More information and application details can be found online at www.socaccelerator.com/australia.



Roger Elfenbein, Peter Crane, Dr Christine Pitt, Peter Schutz, Hamish Thomson.

Stronger Ties Between FSANZ and EFSA

The collaborative relationship between the European Food Safety Authority (EFSA) and Food Standards Australia New Zealand (FSANZ) was strengthened after both agencies signed a Memorandum of Cooperation (MoC) in April 2019.

Having worked together closely since the formation of EFSA in 2002, the MoC recognises the importance of scientific cooperation on data collection, risk assessment and risk communication.

General Manager of Risk Management and Intelligence for FSANZ, Glen Neal, said while food-related risks around the world may vary, sharing information, data and best practices in food science and food regulation can promote consistent approaches in analysing risk.

“Working together on identifying emerging risks is also important as global trade in food expands,” Mr Neal said.

“The strong relationship with EFSA is just one example of the way FSANZ engages with international agencies which also includes participating in expert networks such as Codex, WHO

and the FAO, and co-chairing the APEC Food Safety Cooperation Forum.”
For more information on how FSANZ engages with international

agencies and networks visit: www.foodstandards.gov.au/science/international



Glen Neal (General Manager, FSANZ) and Bernhard Url (Executive Director, EFSA) exchanging the signed MoC.



A new study on home-prepared meals found nine out of 10 consumers have a home-prepared meal made from store-bought ingredients in a four-week period and, on any

given day, 75 per cent of Australians surveyed said they have a home cooked meal.

This research, by global research company The NPD Group, shows

that despite a growing consumer preference for greater convenience, the old-fashioned home cooked meal is still a popular option for many Australians.

Despite the emergence of convenience-first home cooking products and services such as frozen products, ready-to-eat meals, ready-to-heat meals, meal kits and meal plans, there is still a high purchasing drive for fresh rather than frozen meals.

Gimantha Jayasinghe, Deputy Managing Director at The NPD Group, said they expected to see a much higher preference for frozen and ready to eat/heat meals.

“There is a gap in the market, where the needs of convenience-driven consumers are not being satisfied when it comes to eating at home”, Ms Jayasinghe said.

Culture, Cuisine and The Opportunity For Fresh Produce

Catering to the traditions, attitudes and shopping behaviours of multicultural consumers is a sizeable growth opportunity for Australian fruit and vegetable growers and retailers.

Nielsen, the global information and data measurement company, recently published a thought leadership piece - *Culture and Cuisine: The Opportunity for Fresh Produce* - showing this group of shoppers is expected to become even more important over the next few years.

This change is being driven by increased immigration and the influence multicultural consumers have on the cuisines Australians eat. The impact is due largely to the fact that ethnic households shop differently, especially when it comes to fresh produce.

Nielsen reports that multicultural consumer households allocate 21.2 per cent of their total grocery basket volume to fresh fruits and vegetables, compared to 16.6 per cent for non-ethnic households. Over the past year, ethnic households purchased on average 14.6 per cent more kilograms of fruits and vegetables and spent an additional \$45.60 compared to non-ethnic households.

Ethnic households purchased significantly more leafy Asian vegetables, eggplant and herbs in both volume and dollar terms in the past year, meaning these categories are important for growers and retailers who want to capture opportunities posed by culturally diverse households.

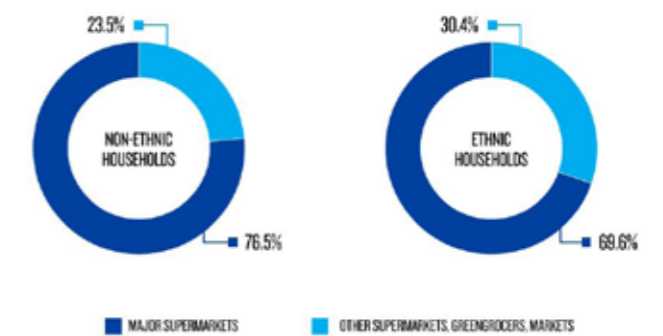
Today, Asian-born Australians account for more than 10 per cent of the overall population, representing a footprint that has more than doubled over the past 20 years, and Nielsen said this trend is likely to continue.

FRESH PRODUCE CONSUMPTION COMPARISON

	NON-ETHNIC HOUSEHOLDS	ETHNIC HOUSEHOLDS
VOLUME (KG) SHARE OF GROCERY BUDGET SPENT ON FRUITS AND VEGETABLES	16.6%	21.2%
AVERAGE WEIGHT PURCHASED (KGS)	190.4	183.8
AVERAGE AMOUNT SPENT (\$)	\$734.50	\$780.10
AVERAGE PRICE PAID PER KG	\$4.58	\$4.24

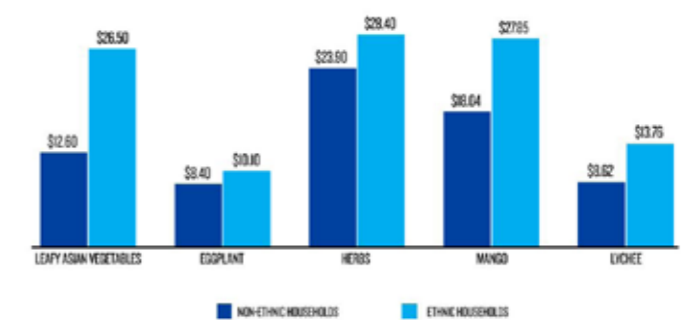
*Source: Nielsen Homescan 52 weeks ending 26/11/2019
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SHARE OF FRESH FRUIT AND VEGETABLE DOLLAR SALES BY CHANNEL



*Note: Major supermarkets defined as Coles + Woolworths + ALDI combined
*Source: Nielsen Homescan 52 weeks ending 26/11/2019

AVERAGE DOLLAR SPEND PER HOUSEHOLD



*Source: Nielsen Homescan 52 weeks ending 26/11/2019
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Austrade 'Better-For-You Foods' Report

As a world leader in researching, developing and manufacturing high-quality, safe and innovative processed foods, Australia has specialist expertise in products that can assist with overall health and wellness, known as 'better-for-you foods'.

To capitalise on these key market advantages, Austrade (the Australian Trade and Investment Commission) has produced the Better-For-You Foods Report, launched 15 April 2019, to highlight our wide-ranging capabilities in better-for-you foods to potential international customers and partners.

The report is based on the premise that Australia's size and geographic diversity mean manufacturers can source a variety of low-cost but high-quality ingredients from a large agricultural sector, transforming them into innovative better-for-you products for the retail, food service, sports, hospital and aged care markets.

The report highlights Australia's industry-driven, government-supported research programs in food technology which offer unique opportunities for international R&D and commercialisation collaborations.



It also cites the fact that the CSIRO, Australia's national science agency, ranks in the top 0.1 per cent of global institutions for citations in the areas of Plant and Animal Science, Agricultural Sciences, Environment/ Ecology and Geosciences.

The report focuses on seven 'better-for-you' segments within Australia's processed food manufacturing industry:

- free-from and low-in foods
- organic food and beverages

- baby food
- food for the elderly
- sports nutrition and weight loss products
- all-natural, health and superfoods
- fortified and functional food and beverages.

The full report can be found at: www.austrade.gov.au/local-sites/singapore/news/from-australia-better-for-you

World First Natural Protection Against Listeria



Danish bioscience company Chr. Hansen has successfully isolated naturally-occurring bacteria strains that can be sprayed onto high-risk foods at the time of manufacture to inhibit growth of the potentially deadly listeria bacteria.

Chr. Hansen Australia and NZ CEO, Kylie Evans, said using "good bacteria" to inhibit the growth of listeria in foods such as processed meats, ready-to-eat meals, smoked salmon and pre-mixed salad, was a game changer for the industry.

"Listeria is responsible for a large number of fatalities and hospital admissions globally every year," Ms Evans said.

"We know manufacturers take great care in the quality of production, but what they can't control is consumers mishandling products once they leave the supermarket shelf, and the potential damage to their brands as a consequence," she said.

In addition to saving lives, Ms Evans said another use of bioprotective cultures would be to reduce unnecessary food waste by extending products' shelf life.

A number of Australian companies are currently testing the cultures through their manufacturing processes, and Chr. Hansen predicts the first products protected by their new product - marketed as SafePro - will be available soon.

AIFST Convention Partners

AIFST would like to acknowledge all of our Convention Partners for 2019 and thank them for their support.



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Wine & Cheese



Dr Adel Yousif



Former Chair of the West Australia branch of the Australian Institute of Food Science and Technology, Dr Adel Yousif has relocated to Hobart to commence a new position as senior lecturer at the Tasmanian Institute of Agriculture (TIA), a joint research and education venture between the University of Tasmania and the Tasmanian government.

As a senior lecturer within TIA's Centre for Food Safety and Innovation, Adel will be engaged in teaching and research related to food chemistry, biochemistry, toxicology and technology.

In Western Australia, he worked with Australian Export

Grains Innovation Centre (AEGIC) to deliver GRDC-funded projects relating to malt quality and un-malted barley enzyme brewing.

Adel was also part of the organising committee for the 2nd Asia Australia Food Innovation Conference (AAFIC), which was supported by the AIFST, and led to the development of a strong connection between Adel and the Institute.

When Adel left the AEGIC, he joined the Curtin University ChemCentre Food Group as a food biochemist where he developed an analysis protocol to assist in antibacterial validation of manuka and jarrah honeys for export markets.

Most recently, Adel worked within the West Australian Department of Primary Industries and Regional Development (DPIRD) on the quinoa quality improvement project. During this time, he developed the innovative quinoa saponin assessment via the "surface tension water droplet method".

Adel was instrumental in re-establishing the West Australian branch of AIFST. Under his stewardship, the WA AIFST branch committee developed

and delivered a number of activities which generated significant value for the Institute.

Safe Food Production Queensland Appoints New CEO



Jim Dodds

Jim Dodds will be Safe Food Production Queensland's new chief executive officer. His appointment comes on the back of 15 years working for the Department of Health Western Australia in numerous positions. Most recently, Mr Dodds was director for the environmental health directorate, overseeing the delivery of all its programs and leading the implementation of public health and subordinate legislation for the government.

Mr Dodds co-chairs the food regulation steering committee's strategic planning working group, researching and delivering longer term projects which shape the direction of the bi-national food regulation system.

As FSANZ considers options on a national level to better manage food safety risks in the horticulture sector, safe food has started planning for how it will engage with Queensland's horticulture industries. Once they understand the existing systems in place, they will begin meeting with industry operators to establish longer-term working arrangements.

"I look forward to being able to carry forward the fantastic work of safe food in expanding and enhancing opportunities for food businesses in the primary sector," Jim said.

Jim was appointed by the governor in council for a period of five years and commenced his position in March 2019.

Kraft Heinz Australia Appoints Simon Laroche as New CEO



Kraft Heinz Australia has appointed Simon Laroche as its new chief executive officer. Simon previously held the role of vice president of sales for Labatt Breweries, Canada's largest brewing company, for more than a decade, where his work spanned international operations and partnerships, including Australia.

In his new role with Kraft Heinz, Simon will be responsible for growing the business, strengthening relationships with retailers and supply chain partners and extending the company's local product innovation.

New Sensory Lecturer for Lincoln University

Dr Damir Torrico has been appointed senior lecturer in sensory science at Lincoln University, New Zealand. Previously (from 2015 to 2019) Damir was postdoctoral research fellow at the University of Melbourne, where his consumer-oriented research has focused on the design and implementation of improved protocols for the sensory evaluation of foods for both research and industrial applications.



Dr Damir Torrico

Dr Sandra Cuthbert

Dr Sandra Cuthbert was recently appointed general manager, food safety and corporate, at Food Standards Australia New Zealand (FSANZ) - the Federal Government agency that develops and administers the Australia New Zealand Food Standards Code.

Prior to joining FSANZ, Sandra had a diverse career in the Australian public service across operational, policy, and regulatory roles.

She led a government initiated review to improve Australia's biosecurity risk management and increase trade, and managed the Australian Commonwealth's discretionary payment mechanisms (including the compensation for detriment caused by defective administration scheme, the whole-of-government's risk management policy, and comcover).

Prior to her work in the public service, Sandra worked as a small animal and wildlife veterinarian.





New Sales Director for Kellogg Australia

Nick Dawes has recently been appointed as the new sales director at Kellogg's Australia. He joins Kellogg's from SC Johnson & Son where he held the position of sales director for their Australian Business. With more than 20 years' experience in the fast-moving consumer good industry (as both supplier and retailer) Nick's expertise spans across Retail Operations, Field Sales, Key Account Management and Customer Marketing.

"Joining Kellogg has been an exciting move for me, for so many reasons. Aside from the great portfolio of brands, I'm thrilled to work for a company that puts its people first, prioritising diversity and inclusion and looking for ways to provide breakfast for those who need it most."

In his new role at Kellogg, Nick is leading the formulation and execution sales strategies to continue driving sustainable growth across all food and grocery categories in which Kellogg's operates.

New CEO at Ixom



Paul Atkinson

Paul Atkinson has been appointed chief executive officer of Ixom, a water treatment and chemical distribution company, commencing in June 2019.

Paul graduated from Monash University with a bachelor of business and brings to Ixom more than 34 years of experience in sales, marketing, and general management. He has worked across a wide spectrum of companies including Pacific Dunlop Limited, Fisher & Paykel Healthcare Corporation Limited, Myer Grace

Brothers Department Stores, Black & Decker and Wander (Australia) Pty Ltd.

Paul comes from Prysmian Group in Asia Pacific, a multinational corporation headquartered in Milan that manufactures electric power transmission and telecommunications cables and systems.

Mr Andrew Larke, Chairman of Ixom, said Paul will play a leading role as the company look to sharpen Ixom's focus on delivering more customer-centric solutions.

Andrew Wilson – New General Manager at Dairy Food Safety Victoria



Andrew Wilson

Dr Andrew Wilson has recently joined the executive team at Dairy Food Safety Victoria as general manager of compliance, enforcement and technical services.

Previously, Andrew held the position of manager, science and strategy at Safe Food Production Queensland, where he was involved with food safety regulation in

primary production and processing across meat, dairy, seafood, egg and horticulture sectors.

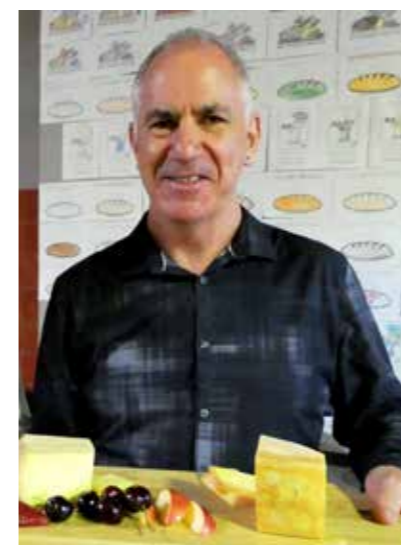
Andrew has a background in agricultural science, with a PhD in ruminant molecular microbiology, and has held a number of roles in the research, academic and regulatory sectors.

Deon Mahoney Sets Off Solo

Deon Mahoney has departed Dairy Food Safety Victoria where he served as chief scientist for six years. As chief scientist, he established a dynamic industry support program which generated a range of user-friendly publications and provided dairy manufacturers with technical advice.

Deon has now started his own consultancy service providing the food industry with support and guidance in areas such as risk assessment and management, regulatory affairs and interpretation of the food standards code, development of food safety programs, and education and training.

Deon continues to be actively engaged with the AIFST.



Dean Mahoney

Adrian Smith – New COO at My Muscle Chef

Adrian Smith has recently moved on from the baking industry and taken up the role of chief operations officer at My Muscle Chef, one of Australia's top-rated ready meal delivery services.

My Muscle Chef has been producing freshly prepared meals since 2013 and has recently expanded beyond home delivery into the retail sector. My Muscle Chef meals are now stocked across Australia in Harris Farm, FoodWorks IGA and Drakes Supermarkets.



Adrian Smith

Lewis Tessarolo – New Senior Director for Sweegen (ANZ)

Lewis Tessarolo has recently taken up the role of senior director, business development at Sweegen, who are at the forefront of Stevia-based sweeteners. Lewis was previously director for DSM Nutritional Products Australia and has over twenty years' experience in the food and beverage industry.

In this new role, Lewis will oversee the Sweegen business in ANZ as it looks to expand its operations in the region.



Lewis Tessarolo

Two New AIFST Board Members

AIFST welcomes the appointment of two new board members following the AGM in May. Sandra Loader and Duncan McDonald bring a wealth of experience to the Institute.



Sandra Loader

Sandra Loader BSc, GAICD, MAIFST

Sandra is a professional company director with more than 10 years of board experience. She is passionate about embracing change and focused on adding value through wisdom gained from 30 years in the FMCG sector in both food and beverage organisations across ANZ.

Sandra's board experience spans not for profit and private sectors across associations, government, and the Food and Beverage sectors as a Non-Executive Director and Chair. Governance is where she loves to add value based on her expertise in the areas of innovation, research and development, strategy, compliance, risk and human capital.



Duncan McDonald

Duncan McDonald BSc Applied Science, UNSW (Food Science and Technology), MBA, GAICD, FAIFST

Duncan has been involved in the food industry for almost 40 years. For the last decade he has run his own food ingredient and technology company and has business interests in Food and Agrifood Science Education. He brings extensive multiskilled senior management and board experience through working in major multinationals including Nestle, Burns Philp and Symrise and in NFP organisations both locally and internationally and in local government.

Duncan has been actively involved in the past with the AIFST including Chairing the Organising Committee of the 2011 AIFST Convention. He is intending to add considerable value to the Board through his extensive knowledge and experience of the Food and related Industries.

AIFST Award Presented to Naomi Siderus at SA Awards Event



Dr Evangeline Mantzioris, Naomi Siderus and Rai Peradka

AIFST member Rai Peradka presented the 2018 AIFST Technology Award to Naomi Siderus on 9 April 2019 during the University of South Australia's School of Pharmacy and Medical Sciences Awards Event. The Award was presented in recognition of Ms Siderus receiving the highest average mark in the third year of her Bachelor of Nutrition and Food Sciences degree.

Waste Not Want Not

The West Australian branch committee of the AIFST (Ms Patricia Elphinstone, Dr Justin Whitely and Dr Adel Yousif) organised a food waste event at the famous Oyster Bar overlooking the Perth Swan River on 10 April 2019.

More than 30 people attended the event to hear two presentations:

- Andrew Wilkinson, partnership and development manager for Foodbank WA presented a talk titled: Food: Waste not, want not.
- Dr Janet Howieson, senior lecturer at Curtin University, presented a talk titled: Waste at your Peril! Add value by food, waste transformation.

Both speakers shared their expertise and passion in the area of food waste management. As a consequence of the presentations and post talk questions, attendees learned much about food recycling, the reduction of food waste in the supply chain, and transforming unavoidable waste into high-value co-products.

Following the presentations, the evening concluded with networking drinks and finger food which provided an excellent opportunity for members and guests to meet colleagues from across the food processing and research sectors, as well as the guest speakers.

The committee would like to take this opportunity to express its gratitude to FB Rice IP Patent and Trade Mark attorneys for their generous sponsorship of the event, and to the presenters who generously gave their time to come and meet with us.

Dr Adel Yousif
AIFST WA Branch Chair



Mr Andrew Wilkinson, Dr Justin Whitely, Ms Patricia Elphinstone, Dr Janet Howieson and Dr Adel Yousif

Bryanna Allan Receives AIFST FFQ CRC Award



Bryanna Louise Allan & Dr Steven Lapidge

Bryanna Louise Allan was presented the AIFST's technology prize by AIFST non-executive Director Dr Steven Lapidge on Tuesday 30 April 2019 at the School of Agriculture food and wine prizes ceremony.

"Receiving the AIFST Prize for the 2018 academic year was a massive honour that really did take me by surprise," Ms Allen said.

"My mother has always been a huge foodie, as well as a passionate advocate for food sustainability, so a passion for food and its complexity has always been in my blood. Whether it be a career in agriculture, processing, food businesses, food legislation, food health or even just enjoying a delicious meal with loved ones - food is a huge part of Australia."

Bryanna has completed a food and nutrition science degree and is currently undertaking a masters in nutrition and dietetics at Flinders University, with a particular interest in the link between the gut microbiome, general health and mental wellbeing.

Ms Allan said she cannot speak highly enough of her lecturers and mentors throughout her degree at the University of Adelaide.

"These included Helen Morris, Rai Peradka, Jo Zhou, Frederick Bowring, Gina Dal Santo and James Ralph," Ms Allen said.

"Being guided by experts who have a clear passion for this field was so valuable to me, and I can credit my achievements to them."

The Health Star Rating: Where To From Here? [Part I]

Words by Greg Gambrill

The non-pejorative, non-judgemental nature of the Health Star Rating (HSR) underpins the incentive for uptake, as anticipated by the original policy objectives.

Indeed, this aspect was not easily achievable and was no doubt one of the main reasons for its acceptance by food manufacturers. To foster uptake, it is not a long stretch to understand that the system had to be non-judgemental of food. Ironically the system never intended to be judgemental of foods, yet always intended to provide a means for consumers to judge. The HSR response was by virtue of the algorithm, being indifferent to perceptions of healthy and unhealthy and instead brutally objective.

The impact of the Five Year Review, for which planning commenced in 2016 and the results of which are expected mid-2019, is likely to be considerable, and potentially understated when applied to individual food sectors or individual companies. On top of this, if objectivity is seen to have been compromised by subjective agendas and policy-based overrides, then the integrity and continued widespread use of the system may be in jeopardy.

From the outset HSR development was governed by policy objectives established by the Australia and New Zealand Food Regulation Ministerial Council in 2009, following the Blewett 'Labelling Logic' review. The policy objectives were wide-ranging yet quite specific in their implications for system design.

Intentions such as agreement

with regulatory instruments like the Nutrient Profiling Scoring Calculator (NPSC) health claims, utilising both risk-associated and non-risk associated nutrients, and providing incentives for improvements to the healthiness of the food supply, were some of the stated objectives. The latter begging the question: how can improvement of foods over time be incentivised, or conversely, how might incentive be compromised?

Uptake success was not to be assured by benchmarks of 'healthy' but by ensuring that the HSR remained an objective assessment of relative risk, based on the best available science of the day. In the review context, if there is no new science suggesting the system be adjusted, then there is no case for change. The impetus must come from elsewhere, yet to maintain objectivity, always be tested against the science and the ability of the system to provide the best possible discernment. There is a very considerable difference between 'healthy' and 'discernibly better'.

Following inception, many issues raised concerning the HSR were driven by perceptions, agendas and value judgements about individual ratings. Some were considered by the Five Year Review and many issues surfaced in the press, social media and discussion forums, at times naively, given that the mechanisms of the algorithm are not obvious.

Indeed, HSR issues are often conceived and stated without access to comprehensive and reliable comparative data, and often

without even impinging on scientific justification, as for example when aberrant ratings result from the misclassification of foods by end users.

Being topical, and the subject of scientific and public opinion, concerns about the 'correctness' of a limited number of food ratings, as well as the relative strength of various nutrient responses, appear to have been a strong driver of the recent Five Year Review.

This is understandable as ratings are the public face of the HSR. Criticism of the system typically has its basis in:

1. The perception of incorrect ratings, real or otherwise, usually referred to as anomalies (dairy desserts, jelly, some extracted oils, confectionery)
2. Rating comparisons, legitimate or not (yoghurt and apples; potato chips and broccoli, whole tomatoes and canned tomatoes)
3. HSR policies that lack the appearance of correctness (the application of scaling to all foods, for example whole fruit and vegetables that rate <5 stars)

Value judgements, opinion or 'atmospherics' had no place in the original development of the algorithm. In the face of all possible factors related to food risk, the HSR simply 'risk ranked' a food's content relative to another, and relative to all category members, facilitating the comparison of legitimate choices within each scaling category.

In achieving this outcome, the multi-dimensional nature of the algorithm

makes it somewhat resilient to modification. The risk relativities are inherent in the profiler and its nutrient tables, and to change one or more of these is a big deal, such that it be based on compelling science.

In addition, it is noteworthy that in reducing all food variability to a 10-point scale, the scaling part of the system (as opposed to the profiling) does not alter the risk relativities. Yet it is able to move ratings in any direction, and can expand, shrink or even compress ratings towards either end of the scale, all with the intention of increased discernment.

Without the scaling algorithm the system would exhibit the weaknesses of less capable nutrient profiling systems unable to recognise food groups of similar nutrient sensitivity and scale them accordingly.

Those seeking to adjust the system by overrides on the scaling procedure or by manipulating category ratings to bring about the appearance of correctness, without adjusting the scaling of other categories, risks invoking greater ratings disharmony than that which may have existed in the initiating cues. The primacy of the algorithm in dealing with all issues of risk relativity is warranted.

Commentary about ratings being in some way incorrect, inexplicable, dangerous for health or not compliant with other benchmarks of 'healthy food' obscures the main game. The key question should be: are there structural flaws in the current system that limit its ability to more effectively deliver a high-resolution continuum of relative risk?

In risk relativity terms, no food is good or bad, other than by comparison. Absolute notions of risk embodied in systems like the Five Food Group (FFG)/Discretionary Scheme have only limited resonance with the HSR. They are best viewed in overlay, as they do not attempt to determine the relative risk for large classes of foods, and certainly not for nutritionally close neighbours.

Food classification systems readily invoke concepts of healthy and unhealthy, ignoring the benefits

of delineating choice amongst neighbour foods and thereby overlooking the incentive for incremental food improvement as a result of comparison in the marketplace.

A less pejorative way to improve the food system is by the incremental influence of better choices on both consumers and manufacturers. One might appear to be constructive by suggesting manipulation of the HSR for greater alignment with other constructs like FFG/Discretionary or Traffic Lights, but if the outcome is other than facilitating best high-resolution choice, it is unlikely to improve the food supply. Worse, it may be little more than an attempt to manipulate the food supply, a self-limiting strategy, lacking sustainable effect if incremental change for reward becomes a moving target.

The HSR was designed from the ground up to be concerned with relative risk, never absolute risk. Relative risk for any food is by definition non-pejorative, being determined by food content data. Sure, one may disagree with the science behind the risk matrix but nevertheless the relative risk negates opinions about what individual ratings 'should be' or 'should not be' and instead draws attention to a food's place in the broad distribution of nutrients in the category involved.

To the HSR algorithm, foods are nothing more than nutrient content data for the profiler to deal with, and a parent category of consistent nutrient response to drive the scaling function. There is no requirement for foods to be named, none have a reputation, brands and manufacturers don't figure and the place of foods in a healthy diet is not under consideration.

The HSR intended to be, in fact had to be, a win-win system – consumers gained a ready-reckoner of food choice and manufacturers gained the opportunity to refurbish foods and take advantage of improved ratings.

In a change management context, manufacturers will, as a minimum, want to maintain existing ratings and

not be disadvantaged by unexplained change that is not based on the two essential determinants of relative risk:

1. The science behind relative risk, embodied in profiler points tables and the nutrient sensitivities of the various categories, and
2. Category membership and scaling, being the assignment of relative risk based on similarities of nutrient response.

It is important to understand the operation of the HSR system itself before addressing matters of perception, insight or opinion. Essentially, the algorithm flowed from the policy objectives, as did the development process, the pivotal aspect being that the system should at its core be a dispassionate mathematical model of relative risk.

In the Australia, New Zealand context, the model fell out of local food data by the application of a risk matrix to various categories of food, the categories derived from the 'plate model' of the Australian Dietary Guidelines. In this way individual foods became comparable, and the different nutrient content of dissimilar categories exhibited divergent expressions of risk. Hence the need for highly nuanced individual scaling of categories, a key structural aspect of the system.

In Part II of this series on the HSR system, we reflect further on the HSR development process and from that suggest possible adjustments to the management of the system and implications for future reviews.

Greg Gambrill was involved with the development of the Health Star Rating from its inception, assisting with the collection of food data for the purpose, and the subsequent development of the HSR profiler and scaling algorithm. More recently he was a member of the Technical Advisory Group appointed by the Health Star Rating Advisory Committee to provide data analysis assistance to the Five Year Review process just completed.



Help Address Food Waste and Food Insecurity: Increase Understanding of Date Labeling

By: Rosetta Newsome, PhD

Understanding Date Labeling

Recently, the U.S. Department of Agriculture (USDA), the U.S. Environmental Protection Agency (EPA), and the U.S. Food and Drug Administration (FDA) released a federal interagency strategy to address food waste.

According to the USDA, the amount of food wasted in the United States is estimated at 30-40 percent of the food supply, on the basis of 31 percent postharvest food losses at the retail and consumer levels, which corresponded to approximately 133 billion pounds and \$161 billion worth of food in 2010. Such a substantial amount of waste has far-reaching impact on food security, resource conservation, and climate change.

A report published by the United Nations Food and Agriculture Organization estimates that nearly 821 million people in the world --approximately one out of every nine people--were affected by chronic undernourishment in 2017. These statistics coupled with the burgeoning global population, estimated to exceed 9 billion by 2050, raise great concern regarding the ability to feed our global community.

So how can we begin to address this? One way is to better understand and help raise awareness of the meaning of food date labeling. There is much confusion regarding whether food is no longer safe to eat, and as a result large amounts of food is unnecessarily discarded.

As this important issue increased in visibility, The Institute of Food Technologists (IFT) engaged in addressing it in a number of ways, including producing resources for outreach and communication.

How Date Labeling Contributes to Food Waste

Because date labeling terminology and uses vary, their meaning is often misunderstood. Date labeling may be based on nutrition, quality, safety, or a combination of these purposes. Misunderstanding of the meaning of date labels can lead to unnecessary food waste, and unnecessary financial burden for consumers, needless use of limited resources at the retail level (e.g., regulatory inspection focused on food quality-related dates rather than public health-related dates), and potential food safety risk associated with perishable foods.

In early 2017, the Grocery Manufacturers Association announced that grocery manufacturers and retailers were joining together to encourage adoption of standard wording about quality and safety on packaging, represented with the phrases "Best if Used By" and "Use By," respectively. "Best if Used By" is intended to refer to expected product quality attributes (e.g., taste or performance) rather than safety; and "Use By" is intended to indicate highly perishable products which may have a food safety concern over time when the food should be discarded.

At the international level, in mid-2018 the Codex Alimentarius Commission revised its *General Standard for the Labelling of Prepackaged Foods in regards to Date Marking*, eliminating the prior definition of "Sell-by" date and including definitions of two separate date marks:

- "Best before date"/"Best quality before date" - beyond which the food may be acceptable for consumption and
- "Use-by date"/"Expiration date" - after which the product should not be sold or consumed due to safety and quality reasons.

IFT is actively involved in Codex and contributed to discussion of the revision of the standard. Prior to this, IFT convened a working group of experts in academia, the food industry, the regulatory community, food banking, a chilled food association, and consulting to publish science-based information to bring clarity to the issue and support science and risk-based decision making. The article—Applications and Perceptions of date labeling of food—was published in 2014 in IFT's peer-reviewed journal *Comprehensive Reviews in Food Science & Food Safety*.

Learn More About Date Labeling and How You Can Help Spread the Word

Ultimately, food safety and security are not only global issues, but issues in which we all have a role. It is essential to leverage science-based information to raise awareness of this issue and help bring clarity to the meaning of date labels, to do what we can to help reduce food waste and address food security for our growing global population.

The Institute of Food Technologists has developed a Date Labeling Toolkit which provides helpful information and shareable content to assist you in further educating others on this important topic.

Visit ift.org/toolkits for details.



Credit: Impossible Foods

Meat Re-Imagined: Alternative Proteins And What They Mean for Australia

Words by Thomas King

The rise of meat alternatives

From humble and ancient beginnings to the modern technological advances of cellular agriculture, bleeding plant-based burgers and hybrid proteins, alternatives to conventional meat have evolved significantly.

The last decade has seen major innovation propelled by shifting consumer demands and global resource constraints – and it’s just the beginning.

While meat remains a large part of diets and economies worldwide, new ingredients and technologies are offering us ways of producing familiar, nutritious and sustainable foods without relying on conventional animal-based agriculture.

In recent years, scientists, chefs and entrepreneurs in the US, Europe and Israel have demonstrated that food science and culinary ingenuity can produce popular, tasty foods – from burgers to dumplings – with fewer impacts on public health, resources and the environment.

Until now, Australia has largely remained an observer, however this is quickly changing. At Food Frontier

over the last two years, we have led industry and government in starting a distinctly Australian discussion on alternative proteins that considers our nation’s unique consumer base, skills, production systems and economy. Today, there are eight emerging Australian start-ups, more options hitting supermarket shelves and restaurant menus each month, and discussions underway about collaborative research efforts.

The increasing demand for new meat alternatives is largely being driven by meat eaters in developed nations seeking to reduce their meat consumption. In the US, 86 per cent of consumers who regularly eat plant-based alternatives do not consider themselves vegetarian or vegan.

The ‘flexitarian’ diet, which places an emphasis on consuming plants without eliminating animal protein entirely, is largely being driven by younger generations wielding their significant buying power and citing health and environmental concerns as primary motivators. This should come as no surprise, with increasing societal awareness about the impacts

of our food choices.

Leading scientists from Chatham House, UNFAO and EAT-Lancet have stated that current methods of food production are insufficient to meet global protein demand without crossing irreversible ecological tipping points and depleting our remaining natural resources.

While efficiency and sustainability improvements to existing food systems are crucial, data demonstrates that this alone will not be sufficient to feed our growing global population over coming years and decades, warranting completely new models of food production to complement traditional systems.

So, what actually are these alternatives, how are they made, and what does all this mean for Australia?

Plant-based meat alternatives

While meat alternatives have existed for centuries, with evidence of tofu being specifically promoted as ‘mock lamb chops’ as early as 965CE, today’s alternatives have come far from humble tofu, or even the soy sausages of the 1980s.

Plant-based meat alternatives now exist in a variety of forms, including whole-food meat mimics such as ‘pulled’ jackfruit and fermentation-based products such as those made by Quorn. The category that has gained the most attention recently is hyper-realistic plant-based meats, like Beyond Meat and the Impossible Burger, two of the most well-known brands.

Plant-based meat aims to replicate the experience of cooking and eating conventional meat – from preparation methods to appearance, texture and flavour – with a lighter environmental footprint and just as much protein. To achieve this, food technologists and chefs develop unique combinations of plant proteins, fats, thickeners, spices and seasonings.

Most companies use protein from pea, soy, potato, wheat or mushrooms. Some of these ingredients are processed using extruders or specialised processing technologies that control the moisture, heating, cooling and pressure to

create functional, taste and textural properties.

Taste, price and convenience are at the forefront of most consumers’ food purchasing decisions, so plant-based meat companies aim to produce accessible options that offer the sensory experience and functionality that consumers enjoy in meat.

The response has been significant, with consumer demand for some products now outpacing supply. According to the CEO of New Zealand’s Sunfed Meats, “we’ve got a good problem, which is that we can’t meet demand.” Some retail and restaurant chains stocking products like the Beyond Burger and Moving Mountains Burger have spoken about these options frequently outselling their conventional counterparts.

Plant-based product launches have more than doubled in the past five years, and Lux Research estimates a doubling in US demand for alternative proteins by 2024.

Worldwide, new plant-based meats

are hitting fast-casual restaurant menus such as Burger King in the US and Grill’d in Australia, and some supermarket chains are stocking them in the meat aisle. The Beyond Burger is now available at more than 33,000 locations, with the company breaking records when it listed on the Nasdaq in early May, becoming the best-performing public offering by a major US company in 2019.

Conventional food producers are launching, acquiring and investing in plant-based brands at a frenetic pace, including global meat giants like Tyson Foods, Cargill, and Maple Leaf Foods.

The pace and magnitude of consumer adoption of plant-based meats is evidence of latent demand. However, continued growth in the sector is largely contingent on funding to scale production and distribution. Plant-based meats are, in some instances, already achieving price parity with animal-based equivalents, particularly premium red meat, however, many are yet to become

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Credit: Impossible Foods

competitive with conventional meat in terms of scale and cost.

Producers of plant-based foods often promote their products' environmental benefits. According to a peer-reviewed life-cycle analysis by the University of Michigan, the Beyond Burger uses 99 per cent less water, 93 per cent less land and 90 per cent fewer greenhouse gas emissions than a quarter pound US beef burger.

Despite the overwhelming response to new plant-based meat products, the sector is still only in its infancy. Enormous opportunities exist in processing technology advancements, protein discovery and characterisation, and the supply of plant-based meat alternatives as ingredients as opposed to branded or standalone products.

Perhaps the greatest opportunity for Australian food producers exists in their embrace of alternative proteins as a diversification of their consumer offering, as exemplified by meat giant Tyson Foods' rebranding as a protein company, a subtle yet significant shift.

Cell-based meat

Replicating meat from plants is one thing, but what about producing genuine beef without raising cattle? Advances in cell-culturing technology – previously restricted to the medical

sector – have now made it possible to grow meat for consumption without needing to breed, feed and kill animals. This field is referred to as cellular agriculture.

At its essence, meat is simply a collection of cells – predominantly muscle cells, fat cells and other cells forming the 'connective tissue'. Cell-based meat involves taking a small sample of stem cells and housing them in a controlled, sterile bioreactor or fermenter. The sample is fed a mixture of nutrients and signalling proteins causing cells to grow and divide as they would on an animal, producing edible meat that offers the sensory and nutritional profile of conventionally farmed meat.

In 2013, Professor Mark Post of Maastricht University captured the public's interest at a London press conference, where he unveiled the world's first beef burger created using cell-culture.

As the prospect of cell-based meat moves from hypothetical to commercially viable, Post's company Mosa Meats has been joined by more than 25 cell-based meat companies globally, including Memphis Meats in the US, SuperMeat in Israel, Higher Steaks in the UK, Shiok Meats in Singapore and Meatable in the Netherlands. Meanwhile, other companies are using cell-culturing technology to produce different animal products, from egg whites (Clara Foods), to dairy (Perfect Day) to gelatin (Geltor).

Several prototypes have been developed since Post's burger, including beef, duck, pork, chicken and tuna, and the cost of producing cell-based meat continues to decrease as production ramps up.

Like their plant-based counterparts, cell-based meat companies have rapidly attracted attention from major investors including conventional meat corporations like Cargill and PHW Gruppe, high-profile investors such as Richard Branson, tech moguls like Google co-founder Sergey Brin, and the governments of Singapore, India and Israel, which have dedicated funding to cellular agriculture research.

Former Tyson Foods CEO, Tom Hayes, said, "If we can grow the meat without the animal, why wouldn't we?"

Producing cell-based meat requires four critical technologies: cell lines, culture medium, scaffolding and bioreactors, all of which are at various stages of development, and none are yet fully optimised for industrial-scale production of cell-based meat.

Initial lifecycle analyses indicate that cell-based meat will require significantly less land and water than feeding and raising cattle. Additionally, environmental and hygiene control of cell-based meat production facilities means lower risk of bacterial contamination.

Hybrid proteins

Plant and meat hybrids are already familiar to consumers, for example, beef burgers that incorporate mushrooms and other plant-based ingredients. Advances in technology are now making it possible to increase the ratio of blended ingredients to conventional meat in popular foods without compromising taste and texture.

Given the significant cost of cell-based meats, it is possible that the earliest commercially available products will be blended with plant proteins. This introductory format may enable a gauging of consumer acceptance while significantly reducing the cost.

Some companies produce insect-based products to blend with conventional foods, in the form of powders or flours, however, there are very few examples of insects being used as successful substitutes in meat-based dishes. Functional and taste limitations, scale-up challenges and low consumer acceptance have meant investment in insects as meat alternatives has remained very low.

Prospects for Australia

As interest in plant-based meat alternatives and hybrid products increase amongst Australian investors, entrepreneurs and food outlets, new businesses and business opportunities have emerged. Similarly, Australia's

cell-based meat ecosystem is growing, with more pioneering scientists and start-ups harnessing the opportunity to revolutionise our food system.

Consumers in our region are also hungry for new options. Euromonitor ranked Australia as the most favourable market for plant-based products, and Roy Morgan research found that one third of Australians are eating less or no meat (11 per cent meatless, 23 per cent reducing). With similar trends emerging in Asia, and food demand estimated to increase 70 per cent by mid-century, Australia's food industry is well-placed to diversify into value-adding forms of protein development, production and export that complement our existing food supply.

Australia boasts world-class research capabilities in the fields required for plant-based and cell-based meat innovation, including food and nutrition science, agricultural sciences, molecular biology, stem cell biology and tissue engineering. Combined with our trusted reputation as a quality food supplier and our capabilities in food manufacturing, marketing, and pulse and grain production, Australia has the chance to secure a competitive foothold in the rapidly emerging sector for plant-based, cell-based and hybrid proteins.

A diversified protein sector offers Australia new industrial opportunities and job creation – from science to agriculture and manufacturing – the implications and quantum of which is being assessed through new research commissioned by Food Frontier and conducted by Deloitte Access Economics, due for release in September 2019.

Investments by the world's largest meat companies into alternative proteins, and their re-positioning as 'protein' providers, signals how conventional agriculture and alternative proteins can coexist, inviting new cooperative opportunities such as supplying primary inputs and producing new crop varieties.

Government has a role to play by providing support and ensuring policies and regulatory frameworks are future-proof and evidence-based, enabling a level playing field for new industry rather than acquiescing to short-sighted, protectionist interests.

Alternative proteins are a reality. Australia now faces the choice of sitting on the sidelines or becoming a sectoral leader. To achieve success, scientists, government, food businesses, start-ups and farmers must work collaboratively to overcome challenges and capitalise on opportunities to fulfil the potential of this new and vibrant industry.

Could our country, known worldwide for its livestock grazing and meat-filled barbecues, soon become an international leader in alternative proteins? With sector-wide innovation and collaboration underpinned by the right policy environment, the answer is an unqualified yes.

To learn more about alternative proteins and opportunities for Australia, download Food Frontier's new paper, *Meat Re-Imagined*, at www.foodfrontier.org/report

Thomas King, CEO at Food Frontier. 

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The Power of Food to Influence the Future Through Better Health & Nutrition

Words by Sharon Natoli

The food industry is in a period of rapid change and two of the key drivers of this transformation are health and sustainability.

Globally, 61 per cent of consumers now consider health a high priority when determining their food choices, while products making claims around sustainability are growing at up to four times the rate of competitor products within the same category.

It's not surprising therefore that businesses positioning for growth are increasingly putting both of these areas at the centre of their long-term strategic planning. And future macro-trends are dictating this is a smart move.

As consumer consciousness about the impact of food purchasing decisions on personal health continues to grow, along with the health of the planet, expectations on food businesses to meet these demands will also continue to grow.

Over time this will not only mean continuing to provide healthier

products produced sustainably, but will also lead to business having a greater voice around issues linked to the future for food, and recognition that upskilling of internal knowledge and awareness of issues in these areas will be critical.

Brasserie Bread is one business that has, since their inception in 2000, linked health and nutrition with sustainability and support of farmers, and used their expertise as bakers to educate consumers about bread making. The company has been pioneering a 'grain first' approach to bread that elevates the importance of the nutritional value of the grain, uses seeds more suitable to the environment in which the grain is grown, and creates a stronger connection between the farmer, the brand and consumers.

In 2018, the company became the first to win both the Royal Agricultural Society's President's Medal and the NSW Department of Primary Industries' Innovation Award.

The strength of the brand, and the commitments that sit behind it, means

many consumers are willing to pay a significantly higher price for its products than other more traditionally produced alternatives.

The idea of food companies leading change, and getting on the same side as consumers to make positive change happen around health and sustainability, is also being embraced by some of the world's largest food companies who own many of the world's well established brands.

In 2018, Danone North America, Mars, Unilever and Nestle together established the Sustainable Food Policy Alliance. This Alliance aims to accelerate change in the food industry around health and the environment by working to influence policy and raise the bar around the need for action.

One initiative the group has undertaken was to make recommendations to the USDA about revisions to the Dietary Guidelines for Americans. Rather than supporting incremental changes that are the usual outcomes of the revision process, the group outlined ways in which the

pace of change can be accelerated, providing additional considerations around food and climate change and food as medicine, and a recognition of culture as a key driver of the foods and beverages people buy and eat.

This highlights how some food businesses, backed with greater knowledge and awareness of the key issues that need to be tackled to ensure a healthier and more sustainable food supply, are now emerging as leading voices in these areas, working together with key agencies to drive change.

Just like a football player who has undergone pre-season training and is ready to tackle game day, food companies that have long been following consumer trends are increasingly getting onto the playing field to lead change, rather than sitting on the sidelines waiting.

Food is a powerful influencer of many of the big issues on consumers' minds, meaning many opportunities exist to develop strategies in these areas that connect with consumers in a meaningful way.

For example, knowing that what we eat is a greater risk factor for mortality than smoking, alcohol, air pollution, or low levels of exercise, provides good context for making commitments to nutrition. And being aware that food is a significant contributor to mental and social health and wellbeing provides significant opportunities to connect with consumers by elevating the importance of a positive food culture. These areas all provide opportunities for brand differentiation.

To evolve innovation and marketing along these lines, here are five key recommendations to consider:

1. Think bigger

It's useful to think full spectrum about all the ways food contributes to better health - from physical attributes to environmental, social and cultural elements of how food is eaten and enjoyed. Understanding these areas and creating guidelines and beliefs around each will help guide decision making around product development and communication and is one way

of getting products to market faster. Consider doing more than selecting single nutrients to highlight.

2. Be the expert

Mike Lee, Founder of the Futures Market, a futurist food lab that works with companies to imagine the future over the next 25 years, recently said that the next big food trend should be the end of food trends. The future, according to Mike, is about getting consumers to explore a little more. This means understanding the actions required to develop healthier and more sustainable products and being an expert in leading both the company and consumers in that direction.

3. Take responsibility

In a presentation to the Consumer Goods Forum in 2017, the CEO of Danone said the food industry had contributed to epidemic levels of diabetes and obesity. It had let a dozen plant species account for 75 per cent of the food we eat and was responsible for destructive monoculture-based farming, water depletion, and over-use of chemicals. This is one example of how some companies are taking responsibility for the past, and developing strategies that help address these areas in the future. Such strategies in turn provide a platform from which to speak to consumers, to be seen as more real and authentic and therefore to grow trust.

4. Lead consumers

Research is increasingly showing that people are looking to food and beverage companies to help them make better choices. Research by Mintel found 63 per cent of British adults would like brands to reward them for leading a healthy lifestyle, increasing to 76 per cent of under-25s. This finding supports results from a global survey in 2017 that found, on average, 90 per cent of people (higher in Asian countries, lower in Western countries), state food and beverage companies have "a lot" of responsibility for ensuring consumers eat a healthy diet.

These findings sit alongside the

paradox of low levels of trust in the information provided by food and beverage companies. However, there are opportunities for those willing to invest in this space, and to lead future change by doing more - not only providing healthier choices, but by stretching this responsibility further and proactively helping and/or rewarding consumers for following a healthier lifestyle

5. Do more than you think you need to

One of the key diet-related health issues we are facing today is the rise of malnutrition co-existing with overweight and obesity. A recent study by the National Heart Foundation found two in three overweight Australians are also malnourished because our diet has become so poor in quality. And while there are many contributing factors, one is that nearly half (42 per cent) of our calories come from ultra-processed foods that are low in nutritional value.

When it comes to reformulating, equal attention therefore needs to be given to adding in the 'good' as well as taking out the 'bad'. This means including more ingredients like wholegrains, nuts, seeds, fruit, veg, spices and herbs as a means of increasing nutrient content.

Elevating our thinking to incorporate more than the attributes of the products in our portfolio is a useful orientation for the future. Demonstrating shared values, connecting in a meaningful way and leading change are all strategies businesses can adopt to tap into the power of food to influence the future and in doing so, build trust, grow market share and support long-term business resilience.

Sharon Natoli is author of Food for a Better Future - a new direction for the global business of food and speaks at conferences and events about the future of food. As Founding Director of Food & Nutrition Australia, she has a 25 year history as an opinion leader and adviser to businesses in the food sector. www.sharonnatoli.com



Ensuring the Future of Food is Safe

Words by Deon Mahoney

As we move towards the third decade of the 21st century, the global food industry faces significant challenges. First and foremost is the requirement to produce ever increasing amounts of safe food with a reduced environmental impact.

Contemporary literature regularly reminds us that we need to feed more people, and fast. The global population is increasing by around 70 million people annually, so by 2050 there may be as many as 9.7 billion consumers to feed.

We will require more efficient systems as current food production will need to almost double to meet

this demand. We will also need to improve the way we preserve food and manage quality to enable us to reduce the volume of food waste. All this at a time when consumers want fresher, organic and less 'messed with' food.

As we look beyond the horizon, we will see a rapidly changing food production and processing landscape and that will bring significant challenges. Changing climatic conditions, shifting eating habits, changed ways of doing business, evolving population demographics, and utilisation of novel ingredients and food sources present previously unrecognised demands on

manufacturers and risks to consumers.

The specific challenges ahead are embodied in the main streams of the 2019 AIFST Convention: what are we doing about improving food safety, meeting nutritional and consumer needs, and supporting our industry to function and compete.

Ongoing food safety challenges

The contemporary fundamentals of microbiological food safety are captured in the rather mundane constructs of using safe raw materials, cooking food correctly, keeping cold food cold, keeping hot food hot, and practicing good hygiene.

These notions are the basis of the World Health Organization's five keys to safer food. The five keys have been translated into more than 87 languages and promoted across the planet for almost 20 years.

The keys seem simple, yet they are difficult to effectively implement and practice. Most of our incidents of foodborne illness can be traced to a failure of one of these five keys - like losing your house keys, it is at the very least an inconvenience, but it may have far more significant consequences.

We need to become better at managing food safety along the entire food supply chain. The burden of illness associated with pathogens such as Campylobacter and Salmonella is unacceptable and must be addressed. The quantity of food that is withdrawn or recalled each year, and consigned to landfill because it fails a microbiological criterion, seriously undermines the notion of a sustainable and efficient food industry.

Higher ambient temperatures are also increasing the food safety risks by placing stresses on the cold chain. Keeping cold food cold remains a critical factor in reducing the risk of foodborne illness.

As an industry, we must more effectively control the quality and safety of our inputs, better manage food processing and preparation operations, and promote improved food hygiene practices in the food service and home environment.

Challenging food production environments

Extreme weather events, never-ending drought conditions and higher ambient temperatures are increasingly being experienced and imperil our food production systems and impact the safety and quality of our food supplies. Then when it does finally rain, extreme precipitation events damage crops and soil, leading to reduced yields.

The further a consumer lives from the equator, the greater the variation in climate. What becomes important is each crop and animal's optimal range of temperatures for growth and reproduction. At the simplest level, increasing temperatures are negatively impacting the productivity of some animal industries, while once marginal cropping areas in higher and lower latitudes are increasingly able to support agricultural production.

Higher temperatures are creating real impacts on the marine environment and our seafood species. Higher water temperatures increase the incidence of pathogens and marine diseases in aquaculture, impacting important species such as oysters and salmon. For example, pathogens such as Vibrio are more prevalent when sea temperatures rise, and we are observing more frequent algal blooms and red tides, which restrict harvesting and reduce outputs.

Agriculture around the world will need to adapt and boost production and yields to meet future demands.

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Australian agriculture is renowned for its growth in productivity through improvements in genetics and breeding, farming science and the uptake of innovation. This must not cease, but today's farmers face competing land use demands, problems with accessing adequate water, increasing input costs, and shrinking returns.

To realistically meet future food demands, it is essential we address the uncertainty over our farm production environments.

Cellular agriculture

Recently the EAT-Lancet Commission on healthy diets from sustainable food systems linked nutritional targets with environmental sustainability, and implored us to reduce our consumption of animal products.

As an alternative source of protein, the innovative cellular agriculture movement stepped into the breach, predicting a bright laboratory-produced meat and milk future.

But the development of this sector has been very slow. The challenges include obtaining effective cell lines, developing suitable growth substrates, and an ongoing dependence on animal products. Cell culture growth media requires inorganic and organic components including carbohydrates, amino acids and vitamins in order to maintain cell viability in the cultured cell population.

The quantity of nutrients required to go beyond laboratory-scale pilot studies is immense, plus there are still questions about the environmental outcomes. We need unbiased life-cycle assessments of cultured meat technology to establish nutrient and energy requirements, and to objectively describe the environmental outcomes.

We also need detailed discussions about the labelling and public acceptance issues for cultured meat. As a food industry we are very aware that public ignorance of, and disquiet with, concepts such as food irradiation and the use of genetically

modified organisms can really impact acceptance.

Reviews of social media and commentary on news articles have shown the perceived unnaturalness of cultured meat will be an issue. As with so many scientific developments, the abundance of aspiration rhetoric coupled with the relative lack of assessments, has made for an ambiguous and at times prematurely optimistic discourse around cultured meat.

Edible insects

Researchers continue to explore a range of non-traditional and novel ingredients and foods. Edible insects present an opportunity to expand the human diet, although there is a predictable aversion to their consumption.

Australian bush foods have at times included edible beetle larvae and caterpillars, honey ants, scale insects, lerps and the Bogong moth. Witchetty grubs, the white, wood-eating larvae of moths are also important insect foods commonly harvested in the Australian desert where they are consumed either raw or lightly cooked, and are a high-protein, high-fat food. Similarly, the Bogong moth is a tasty, high-protein and high-fat resource.

Progress with development and innovation in mass-rearing of insects offers a significant opportunity to merge traditional eating practices with modern science in both developed and developing countries.

But there are challenges, including managing the microbiological safety of insect-based food, and potential exposure to chemical hazards such as environmental contaminants, heavy metals, and pesticides. There is also the potential that insect proteins may harbour potential allergens resulting in allergic reactions in sensitive humans (Immunoglobulin E mediated). Cross-reactivity/co-sensitisation between edible insects and crustaceans is considered clinically relevant.

The FSANZ Advisory Committee on Novel Foods has assessed super

mealworms, house crickets, and mealworm beetles as non-traditional and not novel foods, and found no safety concerns for human consumption.

The future of insects as a sustainable source of nutrition will require acceptance by consumers, a detailed exploration of food safety and food allergy risks, and the development of codes of hygienic practice and food safety regulations.


Population dynamics

We continue to observe the greying of the Australian population. By 2025 it is estimated the Australian population will exceed 27 million, with almost 18 per cent over 65 years. At the same time, around six per cent of the population will be under five years.

Combined with pregnant, immunocompromised, and other vulnerable groups, over a quarter of our population will soon be classified as 'at-risk'. This means the presence of pathogens such as *Listeria monocytogenes* in foods present a clear danger for a sizeable proportion of consumers.

This also raises questions as to how well equipped our industry is to deal with managing the food safety risks and how willing our standard-setting agency is to address risk management for what will be a significant sub-population. It must extend beyond ad hoc publishing of brochures, into the development and implementation of efficient risk management and effective risk communication actions.

In summary, the axiom that food and agriculture are fundamental to human survival has never been truer. Our agriculture and food sectors must dig deeper – analyse future needs, plan better, and work with multidisciplinary expert teams so we can meet the dual challenges of assuring food safety in a time of food security.

Deon Mahoney is food safety advisor at DeonMahoneyConsulting. 



Continuing Professional Development

Words by Robin Sherlock and Fiona Fleming

Education and continuing professional development

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

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

This year, education will be a major focus for AIFST as we develop and implement our 2019-2021 strategy built around the key priorities of grow, learn, connect and represent. As an organisation it is important AIFST supports the continued growth of the Australian food industry by building the skills, capacity and networks of food industry professionals to ensure they contribute value to the global operating environment.

Why a CPD program?

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

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

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

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

What is a CPD program?

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

The AIFST CPD program

The AIFST CPD program will be launched at the 2019 AIFST Convention in Sydney. It will


be voluntary and designed to encourage members to maintain currency of skills and knowledge and assist with career planning. It will provide recognition of experience and interests and align food scientists with other well-respected professions.

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

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

How do I get involved?

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

Rob Sherlock is a consultant with Sherlock Food Allergen Risk Management Pty Ltd. Fiona Fleming is Managing Director of AIFST. 

Accessible Packaging Design is a Must for Modern Food Manufacturing

Words by Nerida Kelton, MAIP

How many times have we all grabbed a knife to open a pack of ham, spilt food across the kitchen because the pack was too hard to open, been unable to read the text on the pack (even with glasses on) and then vowed to never buy that brand again? These challenges are even more pronounced for the ageing population, those hospitalised, people with a disability, arthritis sufferers and children.

Accessible Packaging Design that is intuitive, easy-to-open and innovative should be an integral part of packaging new product design (NPD) processes.

All too often accessible packaging is not considered when designing products, which in turn leads to unnecessary frustration when opening and closing packs or reading the ingredients or instructions on packaging. It is important that packaging technologists consider how their packaging design could affect someone's ability to eat and drink and the flow on effect on food wastage.

Research from Arthritis Australia in 2018 shows that:

- All consumers struggle with packaging at times, but those most impacted are the ageing population, consumers with disabilities, arthritis sufferers and children
- 44% of consumers struggle with packaging every day
- 92% of consumers have spilt or damaged a product when trying to open the packaging

- When consumers experience hard-to-open packaging:
 - 56% look for the production a different type of packaging
 - 21% look at buying a competitor's product
- 65% of consumers have had to wait for someone to come and open packaging for them
- Half of all consumers have injured themselves opening packaging – including deep cuts and chipped teeth
- 89% of consumers feel 'frustrated' or 'furious' with packaging
- 67,000 consumers in the UK visit hospital casualty departments every year due to an accident involving food and drink packaging.

Accessible design and ease of use critical design elements need to be considered in all packing design decisions and packaging technologists should be using available resources and training to better understand the needs of the wider consumer market.

Step one: accessibility packaging design guidelines

If the accessibility packaging design guidelines aren't being utilised, then it's possible brands could be losing customers whose abilities are not being considered and needs are not being met. These Guidelines were developed by Arthritis Australia, in conjunction with Dr Brad Fain from Georgia Tech Research Institute, and are available in New Zealand through a

partnership with Arthritis New Zealand.

Some of the key guidelines are that packaging must be easy to open and use for those with limited functional abilities, packaging labelling must be highly legible, packaging shall be fit-for-purpose, and must be able to demonstrate accessibility.

Step two: accessible packaging design training

The Australian Institute of Packaging (AIP), in conjunction with Arthritis Australia and Georgia Tech Research Institute, has developed a half-day training course on accessible packaging design. The course allows attendees to become aware of design requirements and understand ease of use packaging design tools, including examples from around the world. It provides information on changing household demographics, meal preparation requirements and case studies from users.

Attendees learn measuring techniques, the types of injuries caused by packaging, and current consumer satisfaction levels with packaging accessibility. The course offers an activities-based approach and hands-on team exercises, helping participants understand the constraints on current packaging designs for people with disabilities, arthritis sufferers, children and the ageing population. This includes testing with simulation gloves developed by Georgia Tech Research Institute and reading glasses from a UK researcher.

Step three: Recognition of Innovative accessible packaging design

The AIP, in conjunction with Arthritis Australia and New Zealand, has developed a new accessible packaging design award to recognise packaging that is accessible, intuitive, easy-to-open and innovative, as a part of the Australasian Packaging Innovation & Design Awards.

The judges were looking for accessible packaging design that included measuring techniques, an understanding of injuries caused by packaging, and consumer satisfaction levels with packaging accessibility. The inaugural award winners were announced this month, with SPC Ardmona winning gold and Flavour Creations winning silver. The other two finalists were Moana New Zealand & Sealed Air for Cryovac® Grip and Tear®, and Campbell Arnott's.

SPC Ardmona have developed their SPC ProVital Easy-Open Diced Fruit in Jelly range that is carefully designed for all consumers to open, including those with reduced fine motor skills, dexterity and strength. On-pack communication is clear, crisp and legible for all. This design achieved 'easy to open' certification as well as an ISR +8 accessibility rating, meaning the product is universally easy to open, with 95 per cent of the population able to open the pack without tools.

Flavour Creations developed their pre-thickened ready-to-drink (RTD) packaging in a new dysphagia cup and cup holder, designed to specifically increase rates of hydration and decrease rates of malnutrition for residents and patients with dysphagia. Along with a reusable holder and plastic over seal, the snap fitting portion control cup has a large overhanging tab that has textured and clear 'peel back' wording to make it very obvious how to open the product.

Moana New Zealand & Sealed Air for Cryovac Grip and Tear (including 'small tab') was designed to foster ease of use for packaged meat, poultry and seafood products for processors, food service and retail markets. This accessible packaging enables convenient product access using a design that is simple and intuitive for consumers to use, irrespective of their age or functional abilities. Previously, these difficult to open items required opening tools which could easily cause injuries.

The Grip and Tear feature means the packs can now be easily opened by a simple hand action. Sealed Air have undertaken significant design innovation in the development of the Grip and Tear feature in order to meet both the food handling and food protection requirements for a wide range of products that may use this new packaging format.

Campbell Arnott's have redesigned 10 SKUs from their catering range of portion control packaging to adhere to accessible packaging design guidelines. Key features of the Campbell Arnott's packaging include serrated edges on both sides of the pack to reduce the force required to tear the corner of the packaging open, and providing consumers a clear written message on how to open the pack. Arnott's received an ISR +8 accessibility rating for this new style of packaging.

Nerida Kelton MAIP is executive director of the Australian Institute of Packaging (AIP) and ANZ Board Member of the World Packaging Organisation (WPO).

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Food Technology Disruption – What’s Next?

Words by Geoffrey Annison, PhD



In early April 2019, the headline “Burger King is cashing in on veganism” leapt from the pages of the Australian Financial Review. Follow-up reading and internet videos revealed that not only had the technology for plant-based meat protein in the “Impossible Whopper” come a long way, but consumers liked the product at least as much as the original.

Of course, meat substitutes have been around for a long time, but the earlier iterations were often found wanting – they simply didn’t have the appearance, flavour or mouthfeel of their animal derived counterparts.

These shortcomings, it seems, are now largely overcome – not through a single technology, but through many technologies. Feedstock proteins can now be sourced from plants, fungi, cell cultures and fermentation, as well as from exotic animals (ie insects) or blends and combinations of these sources (see www.foodfrontier.org for more information).

So it seems the main challenges are not how to produce realistic substitutes to animal-derived meat products, but rather how to produce them economically, market them to consumers, and guide them through potential regulatory hurdles.

With regard to economics, it may ultimately be simple economies of scale which allow these novel products to compete with conventional production systems. This begs the question, however, whether there will be sufficient demand from mainstream consumers? Of course animal welfare may be one driver, but health is bound to be another.

The nutritional profile of the alternative products is more malleable than conventional animal products, with opportunities to moderate fat content and profile in particular. On the other hand, there may be a ‘watch-out’ when it comes to amino acid composition. Those following a true vegan diet must be particularly conscientious in ensuring adequate dietary intakes of the essential amino acids. The same might apply to future consumers adhering to diets containing little or no animal derived protein, particularly if they don’t consider themselves vegan.

Another consumer driver may be the environmental credentials of the new production systems. Of course, whether it’s carbon footprint, water usage or the potential to pollute, credence claims on labels or in promotions based on these factors will

need to be evidence based.

And, of course, claims are likely to be comparative, attracting the scrutiny of those still producing conventional products. Politicians, bureaucrats and regulators are also going to be alert to the implications of significant volumes of new products entering the market. Interests, and vested interests, will seek action from regulatory agencies and the sectors they serve if they perceive a threat.

Australia’s regulatory system is already taking note of the proliferation of food technologies leading to new foods designed to compete with, and possibly supplant, existing foods in the average consumer’s diet. In their 11 October 2018 communiqué, the Ministerial Forum on food regulation “... noted recent international regulatory amendments in relation to the naming of food products, including meat and dairy alternative products”.

The Ministerial Food Regulation Standing Committee is developing an options paper on how food standards, including labelling, definitions and other elements, might be considered by the forum to address their concerns (<https://foodregulation.gov.au/internet/fr/publishing.nsf/Content/current-activities>).

Those concerns have not been clearly enunciated, but as foods come onto the market designed to be not only alternatives or substitutes of mainstream products, but actually mimic them from a culinary standpoint, protection of consumers is bound to be raised as an issue. This is, of course, entirely appropriate as long as consumer protection is not used as a stalking horse for other sector-based agendas.

Ensuring products are appropriately assessed regarding their nutritional profile, and the potential for new or cross-reactive allergen sensitivities, will need to be explored and assessed to determine whether an overt regulatory response is required. As with many issues, a case-by-case assessment is likely to be required, along with a robust principles framework which should include appropriate risk assessments and proportionate regulatory responses.

These steps will be important for industry if it is going to continue to innovate and be responsive to consumer demands driven by health interests, animal welfare and environmental concerns. The current work by Food Standards Australia New Zealand, under *Proposal P1024 – Revision of the Regulation of Nutritive Substances & Novel Foods*, will be critical to setting up the required framework.

Making sure the foods are appropriately described will be another challenge. Their source, and their potential use as a food, must be approached carefully, particularly where claims suggest their nutritional equivalence to conventional food products. Their suitability for some consumers may also require agreement across stakeholders. For example, would proteins produced in fermentation from cells originally derived from animals be considered suitable for vegans? Today’s production, and use of microbial-derived rennet, suggests it should be.

All these factors suggest the food system may be in for a period of major disruption. Of course, change has been the only constant in food production during the modern era – but the rate of change is accelerating. For food companies, their management of information will be paramount to ensuring compliance with all regulations.

The AFGC’s Product Information Form (PIF) has long been the industry standard for information exchange about food ingredients along the supply chain. The PIF has been through several versions and formats, as information needs for both regulatory compliance and commercial requirements rapidly expanded. And now a brand new version is available for the industry’s use.

The new PIF V6.0 tool was developed by the food industry in Australia and New Zealand in partnership with vendor software companies Bizcaps Software, Hamilton Grant and Oakbarrel Software. It enables companies to obtain and share information required to meet obligations under regulatory requirements and industry codes regarding food ingredients and finished products in a consistent and standardised manner.

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More specifically, the PIF structure has been updated to take advantage of the online platform to better organise data and improve workflow of PIF users. Provision for the new country of origin labelling, allergen traceability and GM status treatment have been restructured to make using the PIF system clearer and simpler.

Information required for commercial purposes (product images, certificates of analysis, safety data sheets) can also be transmitted with PIF V6. It also features updated content and utilises business-to-business (B2B) software solutions. It streamlines the process of recording and reporting product information via secure online vendor portals, making it easier, faster and more efficient to use.

Companies may now create new PIFs through one of the three online PIF V6 vendor portals. Once created, they can share B2B data via a number of methods, most efficiently via portal-to-portal exchange, but also emailed .pdf or .xml files.

With an emphasis on ease of use, interoperability with other product information systems, and absolute security, the concept of 'one true source' of company product data has become a reality.

The system has also been designed for optimal flexibility. There are four types of PIF which can be created within the PIF system, including a simple PIF for when companies only want to exchange data about product samples. This is effectively a 'cut-down' version of the PIF. A 'flavours' PIF option has also been provided, again representing the specific information requirements of this type of product. The third type is a food ingredient PIF and, lastly, there is a retail-ready PIF for products ready to go on the supermarket shelf.

Additional flexibility has been built into the system by providing hierarchies of access to PIFs through the portal systems. PIF owners can provide increasing degrees of data access to people in their own

organisation, or to third parties, based on specific system permissions. This means control of commercially sensitive information is assured.

As a consequence of this step-change, the AFGC will no longer be supporting the MS-EXCEL spreadsheet-based version of the PIF (PIF v5). PIF v5 has not been updated since 2012 and should be withdrawn from use. There are now conversion tools available to facilitate the upgrade from PIF v5 to PIF V6.0.

While it may be true that new food technologies threaten disruption, modern information technologies, through the PIF, provide solutions to allow disruption in a way which supports industry to flourish and meet the needs of their consumers.

Dr Geoffrey Annison is Deputy Chief Executive at the Australian Food & Grocery Council and Professional Member of AIFST.



Tackling the Challenges of Traceability

Food organisations today are under ever increasing scrutiny by consumers and regulators. The demands to supply safer, higher quality foods and achieve greater supply chain efficiencies are driving brands to explore new ways to help meet these challenges.

Traceability is a key enabler for trust and safety in the food supply chain, between consumers and brands, and also between manufacturers and their suppliers. To achieve true traceability, it's critical to have end-to-end supply chain visibility and real-time information sharing amongst supply chain partners.

A powerful solution

While supply chain traceability has been possible with GS1 standards for some time, companies are now looking for greater opportunities for improved visibility across their entire supply chain, both up and down the line. That's where GS1 comes in.

GS1 is a not-for-profit organisation that develops and maintains global

standards for business communication. The power of GS1 standards provides the building blocks for interoperable, end-to-end traceability. While most businesses already have some of these foundations in place, bringing them together to become a true traceability solution requires more.

GS1 offers you the guidance to help simplify and 'demystify' the traceability implementation process by outlining the considerations, requirements and steps that must be taken for an end-to-end traceability system, and the benefits that follow. Traceability systems can help trading partners solve some of their biggest challenges resulting in:

- Savings on the cost of trying to integrate across incompatible systems and allowing any technology to use the same data formats so data can automatically move with the product
- Help with monitoring the product, in product recalls and in meeting regulatory compliance, and
- Identification of the product,

verification that it is the authentic product, and it creates a 'licence plate' on the product that is visible along its supply chain and globally recognised.

The journey towards a national traceability framework

To enhance food supply chain integrity and enable seamless information-sharing amongst trading partners, the Australian Government, via the Department of Agriculture, Water and Resources, has launched the National Traceability Project. To support this national effort, GS1 Australia has partnered with Deakin University Centre for Supply Chain and Logistics, and Food Innovation Australia Limited (FIAL) in the development of Traceability Implementation Guides.

The utilisation of GS1's global traceability standard will allow businesses to have end-to-end real-time visibility of the supply chain using global open standards.



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ARC FOOD RESEARCH ROUNDUP

Words by Dr Martin Palmer



Since the recognition of 'Food' as a National Science & Research Priority in 2015, the Commonwealth, through the Australian Research Council (ARC) has become a significant funder of food-related research at Australian Universities. These projects vary in size and complexity, from multi-million dollar industrial transformation research hubs and training centres to smaller linkage and discovery projects.

Many projects also feature co-funding from industrial research partners, often providing substantial total research support over three to five years, as well as an opportunity to enhance the industrial relevance and impact of the research.

Examples of ARC research hubs and training centres include:

- Dairy Innovation (Universities of Melbourne and Queensland)
- Commercial Development of

Rock Lobster Culture Systems (University of Tasmania)

- Innovative Wine Production (University of Adelaide)
- Food Safety in the Fresh Produce Industry (University of Sydney)

Of the newly funded projects announced recently by ARC and due to commence in 2019, around 40 fall into the broad 'food' category, with a total ARC funding allocation of more than \$15 million for the lifetime of the projects.

The classification is not always clear, as the research collectively involves many different disciplines. Some, like social science, psychology, ecology, animal nutrition, plant genetics and pest management, are on the fringe of our profession. Others, like those in the following selection of new projects, are more readily relatable to 'food science and technology'.¹

Flexible and printable sensors for early detection of food spoilage

- Prof. Fariba Dheghani, University of Sydney. This project aims to develop a technological platform for the fabrication of flexible sensors for the detection of food spoilage and life-threatening microbial contamination.

By engineering stimuli-responsive inks, colorimetric, chemi-resistive and impedimetric sensor arrays will be printed on flexible plastics and paper substrates. The printed sensor arrays will respond to gases and volatile compounds generated from food spoilage, microbial pathogens, temperature and pH, by a change in their colour or electrical properties, hence providing real-time measurements.

The project will enable the design of efficient data-driven decision-making tools along the supply chain to enhance food safety and reduce food waste.

Unravelling the relationship between food and the brain

- Dr Robyn Brown, University of Melbourne. This project aims to investigate how highly palatable foods, high in fat and sugar, interact with the brain to cause their overconsumption.

These 'junk' foods cause plasticity in brain reward circuitry in a manner similar to drugs of abuse. Identifying how these foods interact with reward areas of the brain will explore the neural mechanisms underlying the hedonic nature of appetite.

This project will not only inform our understanding of how exposure to these foods can contribute to overeating and obesity but will also provide evidence to inform policy options relevant to advertising and marketing of such foods.

Governing harmful commodities: the case of ultra-processed foods

- Prof Sharon Friel, Australian National University. This project aims to generate new knowledge on how to influence public policy in order to reduce the supply and consumption of potentially health-harming, ultra-processed foods.

Using governance theory and qualitative techniques, the project intends to identify the actors who are influential in the three key policy areas of trade, taxation and marketing and who affect the consumption of these foods in Australia, Thailand and Fiji. Expected outcomes include strategies for pursuing these different actors' interests and evidence that can help institutions promote better policies. Intended benefits include better nutrition outcomes in Australia, Thailand and Fiji.

Milk mimicry: self-assembly in complex lipid mixtures during digestion

- Dr Andrew Clulow, Monash University. This project aims to decipher the chemical complexity required to mimic the digestive behaviour of milk fats and to identify their influence on lipophilic nutrient activity during transit through the gut.



The link between milk's complex fat composition and its nutrient delivery properties are unknown because the digestive colloidal structures that drive fat-soluble nutrient absorption are poorly understood. The project expects to identify which milk lipids are essential to milk's role as nature's nutrient delivery vehicle. It will also identify a universally-available nutrient delivery platform and enhance knowledge of lipid physical chemistry.

The findings will promote greater interaction between the dairy and pharmaceutical industries, adding value to their respective products.

Unravelling a novel stress-signalling system in bacteria

- Assoc. Prof. Mark Turner, University of Queensland. This project aims to investigate the recently discovered cyclic-di-AMP signalling system in industrially important bacteria.

Cyclic-di-AMP is essential for normal bacterial growth and plays key roles in heat and antibiotic resistance, metabolism and virulence. This project will develop new biological assays to shed light on how bacteria sense and respond to environmental stress. This should lead to benefits such as guiding the improvement of bacterial strains used in fermented foods and biotechnological applications, and may provide the foundation for the development of novel antibiotics.

Seafood safety: high throughput diagnostics for ciguatera risk assessment

- Assoc. Prof. Shauna Murray, University of Technology, Sydney.

This project aims to develop a novel, high throughput platform for rapidly assessing ciguatoxins. Species of the marine microalgae *Gambierdiscus* produce ciguatoxins, which accumulate in fish through marine food chains to cause the often-debilitating human illness, ciguatera fish poisoning.

This represents a growing and substantial risk for the Australian commercial fishing industry, as this serious illness is increasingly impacting more southerly areas of Australia due to environmental changes. The outcomes of this project will include new knowledge of the risk of ciguatoxins at Australian 'hot spot' sites, field-tested methods for detecting *Gambierdiscus* and ciguatoxins in situ, and key data to inform policy to safeguard both the seafood industry and consumers.

More detail on these and other ARC-funded projects can be found on the ARC website (www.arc.gov.au), including a searchable database for all new, current and completed research.

References

1. Edited project summaries taken directly from the ARC website (<http://www.arc.gov.au>)

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

FOOD FILES

Words by Drs Russell Keast, Georgie Russell and Gie Liem



Alimentary! A new class of taste

Sweet, sour, salt and bitter have been classified as 'basic tastes' since Aristotle penned *De Anima* around 320BC. Briefly, basic tastes are tastes that do not produce a taste perception similar to any other taste, and cannot be produced by combining other tastes.

Over the millennia there have been hundreds of lists of basic tastes, with new tastes coming and going depending on the views of the day. However, there have been four constants on every list of tastes – sweet, sour, salt, and bitter and through the advancement of research umami and fat have been added. So current evidence suggests six basic tastes, and with the sophistication of modern science, the discovery of receptors on taste cells will likely greatly extend the basic taste list in our lifetime.

Some of the candidates for additional basic tastes include carbohydrate, kokumi, carbon dioxide

and metallic, among others. But none of the new tastes have the perceptual salience of the traditional sweet, sour, salt, and bitter. For example, in Western and European society, are we familiar with the new basic taste umami, even when we taste it? Recent research suggests not.

There is an important distinction here between the four traditional basic tastes and the other tastes. Sweet, sour, salt and bitter are highly relevant in the oral cavity and tell us whether to swallow a food or not, important for species survival, preventing us from consuming poisonous/toxic food, and promoting consumption of nutritious/energy containing food. Yet umami taste, fat taste, and others such as carbohydrate taste, have more influence or relevance after swallowing, or after contact with the oral cavity.

The Centre for Advanced Sensory Science (CASS) at Deakin University has demonstrated that fat taste and carbohydrate taste are linked with dietary consumption of fat and

carbohydrate respectively. But neither of these tastes has the perceptual salience of sweet, sour, salt or bitter, and neither promote or stop consumption based on the perception that arises while the food is in the mouth.

These other tastes have more influence on consumption after swallowing, and that is because we have taste receptors throughout the gastrointestinal tract, which is logical because the passage from the mouth to the anus is one system – the alimentary canal.

Also, taste receptors that exist throughout the alimentary canal are only called taste receptors because they were first identified in the oral cavity. Their role in the gastrointestinal tract is the same as the oral cavity – to recognise various chemical structures – but the output of the recognition is not a taste perception, it is stimulating the digestion processes associated with the nutrients that were swallowed.

We have proposed a new

classification of 'alimentary' taste be used when discussing the new tastes. Alimentary tastes would include umami and fat, which have already met criteria for taste, while other new tastes such as carbohydrate and kokumi would also fit into this classification.

The alimentary tastes have less perceptual relevance in the mouth, but have an increased role when we consider the development of fullness after consuming a food. In this way the alimentary tastes are highly relevant to the obesity crisis we currently face, as increased consumption of foods is a significant public health issue.

The 'basic tastes' remain sweet, sour, salt and bitter, given their historical relevance, perceptual clarity, and the absolute importance of the perception for swallowing or rejecting the food. But as we develop novel research to solve obesity, our understanding of the alimentary tastes starts to assume greater importance than the basic tastes.

Hartley I, Liem G, Keast R. (2019) Umami as an 'Alimentary' taste. A new perspective on taste classification. Nutrients 11, 182: doi:10.3390/nu11010182 (free download)

Food waste

It has been estimated that Australians throw out up to a staggering 20 per cent of the food they purchase, which roughly equates to 345kg of food per household per year. But food waste does not start, nor end, after food has been purchased. Food retail selects fruit and vegetables on their uniformity and discard large quantities because they don't fit the uniform shape and size consumers want. In total, around one third to half of all food that is produced for human consumption is thrown out somewhere along the supply chain and in households.

Several studies have shown consumers are not keen on foods which divert from the norm, because they are, for example, oddly shaped or have other cosmetic imperfections. How can we influence consumers' thinking about these "suboptimal" products? In a recent publication in the

journal *Food Quality and Preference*, Giesen and Hooge aim to answer this very question by manipulating the marketing messages alongside suboptimal food which would otherwise have been thrown out. Consumers in Italy and the Netherlands (n=1804) were asked about their quality perception and purchase intentions of oddly shaped carrots and apples in either the control condition, sustainability condition "Embrace imperfection: Join the fight against food waste!", or authenticity condition "Naturally imperfect: Apples the way they actually look!". It was found that both marketing messages, and especially the message focused on authenticity, could lift the purchase intention and quality perception of the oddly shaped carrots and apples.

While the outcome of this study provides a positive sign, it does not measure actual purchase and consumption behaviour. Also, marketing messages (regardless whether they are focused on sustainability or authenticity) are likely to create a positive halo which impacts quality perception and purchase intention. So it remains to be investigated if consumers are specifically drawn to messages about sustainability and authenticity, or whether consumers just like any positive marketing message about the food they are about to purchase.

Giesen, R.I. & de Hooge. Too ugly, but I love its shape: Reducing food waste of suboptimal products with authenticity (and sustainability) positioning. Food Quality and Preference. Volume 75, July 2019, Pages 249-259

Healthy foods from environmentally sustainable systems: the role of the consumer

The prestigious medical journal *The Lancet* has recently released a report called "Food in the Anthropocene: the EAT-Lancet commission on healthy diets from sustainable food systems".

The report noted that current food systems are threatening both human health and environmental health and that "a global transformation of the

food system is urgently needed" (p.447). Consumers can play an important role in helping shift food systems to those that are both healthy and environmentally sustainable. An important question becomes, then, what is likely to drive consumer demand for healthy and sustainable foods?

Although a complex problem, and multiple solutions are required, helping consumers be more informed about where their food comes from, how it has been grown, transported and processed and about other characteristics of supply chains, could be one way to help to shift consumer behaviours.

Technological advancements that allow for greater transparency in supply chains, such as blockchain technology, offer new opportunities beyond current labelling schemes. Farmers can communicate directly to consumers about where their foods are grown, outline their production practices, what they are doing well (such as reducing on-farm waste), and why they engage in the practices they do, for example water or pesticide usage.

Greater traceability and transparency in supply chains could also help reduce food waste by providing accurate information related to shelf life and food safety. More transparency in food production practices could also lead easier analysis of environmental impacts of food production as well as increased consumer trust in companies and brands.

Many companies are already making advances in areas consumers could benefit from knowing more about, thus benefiting the consumer, the company and the environment.

Willett W, et al. Food in the Anthropocene: the EAT-Lancet Commission on healthy diets from sustainable food systems. Lancet 2018; 393: 447-92

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



A New Food Sector Resilience Tool

In our increasingly volatile and uncertain world it is likely that only those organisations who truly understand and develop resilience will be the ones to survive and prosper over the long term.

With this challenge in mind, BSI has developed the world's first organisational resilience index report and benchmarking tool that can indicate just how resilient they are.

The Index comes at a time of intense and unrelenting business disruption. Organisational resilience is about the ability to adapt to such change. It is about being innovative, constantly learning and improving to overcome adversity and spring forward to identify and seize new opportunities.

BSI has produced the Index with the aim of improving and embedding a culture of continual improvement. Achieving mastery of organisational resilience requires leaders to reflect upon and challenge assumptions. As seen with financial investments, past prosperity is no guarantee of future success, even for the greatest enterprises. Time and again, inflexibility and inside-out thinking have been shown to be their undoing.

The Index equips today's leaders with a research-based, benchmarking study against which to consider

their organisation's fitness. It covers 48 aspects of resilience, across 16 core elements, and four categories: leadership, people, process and product.

To create the Index, BSI conducted a major international research based study with 1,260 senior business leaders, representing organisations in ten industry sectors across the world.

Overall research findings

BSI's study found that all the 16 core elements that determine organisational resilience are regarded as important, but some elements are considered more important than others.

Reputational risk is deemed to be the most critical element for the long-term success of a business, ranked as even more important than Financial Aspects, Leadership, and Vision and Purpose. Despite Reputation being ranked as highly important, 43 per cent of the leaders interviewed still believe their organisation is strongly susceptible to reputational risk.

The Index highlights that there are widely differing perceptions of resilience in practice across the different industry sectors.

Focusing on food

The food industry is undergoing

massive change, much of it led by science, innovation and customer pressure. The sector is simultaneously grappling with a host of major issues, including:

- A growing awareness and concern about sustainability and the impact of food waste
- Virtual food shopping as an increasing reality
- Blockchain, giving consumers unprecedented information about where their food comes from
- Nutrigenomics (how diet influences our genes)
- Clean labels and clean packaging.

BSI's organisational resilience Index shows the indicators food industry leaders rank highest in terms of importance and performance for their industry (refer graph 1).

Most food industry leaders feel their organisations perform best within their leadership and people responsibilities. This involves effectively managing the financial aspects and resources within their business. Similarly, they believe they are performing well in terms of their community engagement and alignment - where the staff are pulling together in the same strategic direction.

So far, so reassuring, yet in the area which they perceive to be of

most importance across all the core elements, reputational risk, it is in fact merely achieving average performance. One would have thought that given how important a brand is to an organisation, and the values it represents, it would be a top priority to maintain its reputation at all cost.

Another surprising finding is that alignment is ranked at the bottom of the leaders' list of 16 priorities. There appears to be a mismatch between the leaders' perceptions of the importance they place on this core element and their performance in that area relative to the other areas.

Of greater concern, perhaps, is the ranking of innovation as their organisations' lowest performing area, a finding that seems all the more worrying when contrasted with the relatively high importance they attach to it. The same could be said - albeit to a lesser extent - for awareness and training, and supply chain.

Turning to the relatively weak performance they acknowledge for horizon scanning (their ability to identify future opportunities and threats), this may be a reflection of the comparatively low level of importance they attach to this area.

Comparing the food industry with other sectors

The Index identifies supply chain, innovation and horizon scanning to be consistently among the weakest performance elements across most sectors and, the food industry is no exception.

These findings raise important questions for food industry leaders: are they underestimating the risks inherent in today's extended and often complex, global supply chains? Should innovation be redefined and rise higher up their agenda to anticipate customer expectations and stay ahead of the competition? And is their relative neglect of Horizon Scanning born of complacency - inviting unexpected setbacks in the future?

Whatever the reasons behind it, it is fair to say that the food sector is experiencing disruption on

many levels, some directly due to increased competition and others indirectly through the supply chain and increased customer awareness of good practice, ethical influences and sustainability. The food industry is under the spotlight like never before which may nudge a shift in areas of importance and ultimately performance to ensure resilience throughout the organisation, in preparation for a complex future climate.

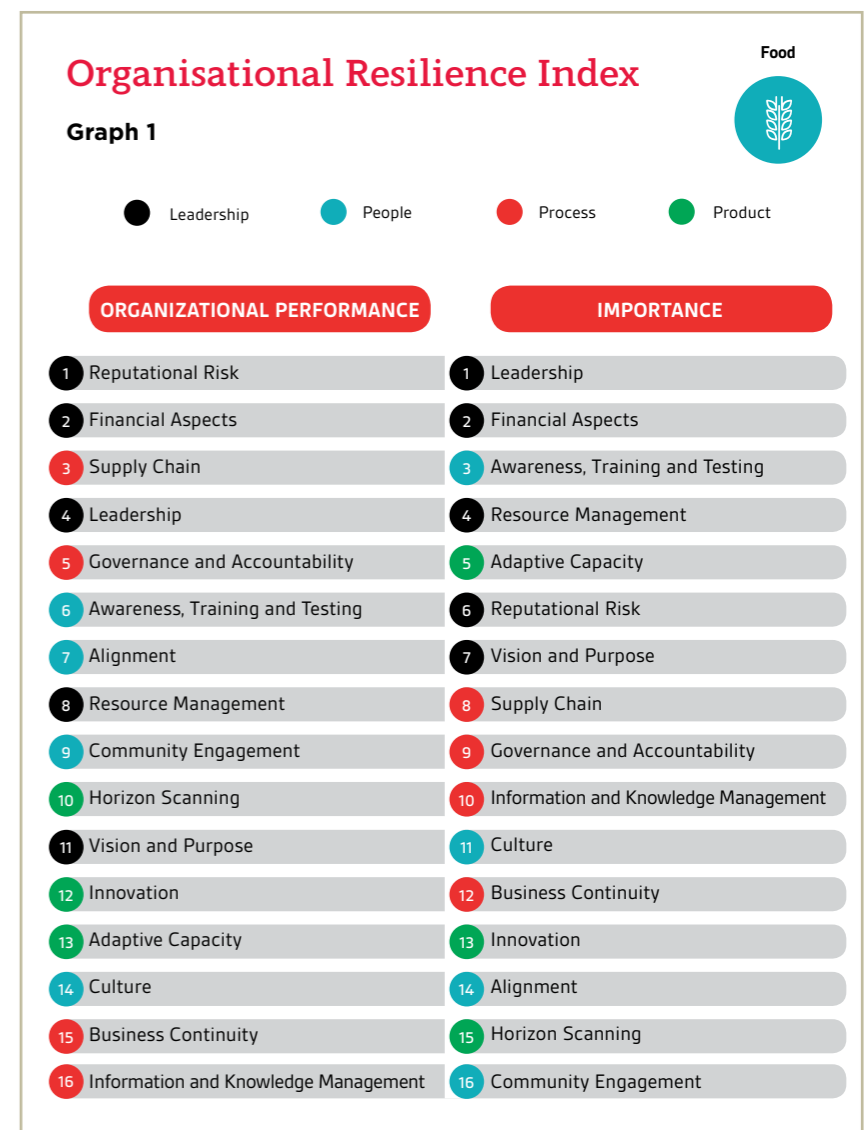
Where are your strengths and weaknesses?

To find out your organisation's relative strengths and weaknesses - and how you compare with the

1,260 organisations behind the BSI Organizational Resilience Index - complete the BSI Organizational Resilience Benchmark tool, a simple questionnaire located at: <https://www.bsigroup.com/en-au/our-services/Organizational-Resilience/>

This online tool will present your results in a spider diagram. It will allow you to compare how you perceive your performance in leadership, people, processes and product, based on the 16 core elements of resilience, against the overall benchmark results.

For more information on organisational resilience in the food sector, contact Trent Bartlett at BSI on 1300 730 134 or email trent.bartlett@bsigroup.com



FAST 5



Carla Mejia

Carla is the Regional Food Technologist with the World Food Programme (WFP), the world's largest humanitarian agency fighting hunger worldwide. Carla is a keynote speaker at the 2019 AIFST Convention. She's currently based in Bangkok, Thailand.

What are the main projects you're currently working on?

One is supply chains for rice fortification. Another is the analysis and improvement of the supply chains of fresh foods for school feeding systems. We would like to not only improve healthy eating by making fresh fruit and vegetables and proteins more accessible, but also improve food safety practices in this context.

In addition, we're looking at food processing in humanitarian food distribution chains, namely foods that are specifically developed for children from the age of six months to two years and that might prevent or help to control undernutrition.

What other industries or food industry areas does your role overlap with?

We have started to apply our work in the food retail space. We would like to have better visibility and understanding of food processes and controls for small operations, or operations that aren't completely automated, like start-ups, so we can apply this knowledge to our

own work at WFP.

We're focused on how we can foster access to healthy foods. Nutrition and food retail systems are big influences on this and are outside our own area of expertise. In particular we're looking at how nutrition and food systems operate in urban environments in developing countries where there are lots of people without access to healthy foods and very few people who have consistent access to healthy foods.

We're also examining sustainability principles in a humanitarian context through the delivery of cash-based assistance, because moving food from one place to another is not very sustainable.

You support a rice fortification initiative in various countries in Asia through technical assistance to private sector counterparts - why rice?


Rice is the most consumed commodity and the most stable food in the Asia region. Thinking about the poorer sectors of the population in this region, many don't have access to a healthy

and nutritious diet, which should be composed of fruit and vegetables, proteins and carbohydrates. They often only have access to one or two of these food groups. As much as we would like to and do encourage fully rounded, healthy diets, the fortification of rice will at least compensate for the lack of micronutrients a lot of populations in this region face.

What do you think is the main challenge we face in Feeding the Future?

The number of people that continues to be hungry is increasing and the main challenge in combating this is the complexity of the problem. Climate change is a big factor in this, but most of the people who are hungry are so because of conflict. Lack of awareness has put a dent in what we have to do, because now there are more people facing more complex problems.

Where do you think the main opportunities in Feeding the Future lie?

The main opportunity is in the commitment of the younger generation. Because of enhanced connectivity they are inherently more aware. Young activists and inventors focused on local solutions provide hope and opportunity. 

Australia 2019

June 19 2019 Contech 2019 Melbourne Cricket Ground, Melbourne, www.aigroup.com.au/business-services/industrysectors/confectionery/#

July 1-2 2019 The AIFST Annual Convention 2019 Sydney International Convention Centre, Sydney, www.aifst.asn.au/events/2019-aifst-convention

July 28-30 2019 FoodTech QLD Brisbane Convention & Exhibition Centre, Brisbane www.aifst.asn.au/foodtech-qld

August 20-22 Asia Pacific Food Safety Conference 26th APAC Food Safety Conference, Doltone House, Pyrmont, Sydney, www.foodsafetyapac.com

August 27-29 2019 69th Australasian Grain Science Conference Rydges on Swanston, Carlton, Melbourne, Victoria, www.ausgrainscience.org.au/conference/2019-conference

September 3-6 2019 Global Table: Feeding Our Future Collins Square, Melbourne, www.globaltable.com.au

September 9-12 2019 Fine Food Australia ICC Sydney, Darling Harbour, Sydney, www.finefoodaustralia.com.au

September 23-26 2019 ICEF13 Melbourne, www.icef13.com

International 2019

July 2-4 2019 NZIFST Annual Conference Christchurch, NZ, www.nzifst.org.nz/events/annual-conf.asp

July 26-27 2019 The 7th International Conference on Nutrition in Medicine 2019 Grand Hyatt, Washington, D.C., www.pcrm.org/icnm

August 7-10 2019 Vietfood and Propack 2019 Saigon Exhibition & Convention Centre, HCMC, www.hcm.foodexvietnam.com/en

September 5-8 2019 Food & Drinks Asia 2019 World Trade Centre, Manila, www.foodanddrinksasia.com.ph

September 23-26 2019 International Dairy Federation Istanbul, Turkey, www.fil-idf.org/event/idf-world-dairy-summit-2019-istanbul-turkey/

September 25-26 2019 Vitafoods Asia Sands Expo & Convention Centre, Marina Bay Sands, Singapore, www.vitafoodsasia.com/en

October 24-27 2019 WorldFood Moscow Russia, www.world-food.ru

October 30-31 2019 29th World Conference on Food and Beverages London, UK, www.foodandbeverages.foodtechconferences.com

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