ISSN 1032 5298 • PRINT POST APPROVED PP241613/00096 VOL 70 ISSUE 3

food australia

JULY – SEPTEMBER 2018

OFFICIAL PUBLICATION OF AIFST

Dietary Fibre Regulations

Time for (A)us to Update?

Overcoming Barriers to Innovation

INNOVATION & COLLABORATION

Key to halving food waste by 2030

Data Digitisation

The path to authenticity, transparency & trust

FIAL

Regulars

australian institute of
food science & technology

Join AIFST today!

Don't be the odd one out!

The Australian Institute of Food Science and Technology (AIFST) is the only national independent voice and network for the nation's food industry professionals.

AIFST provides a suite of services for our members and the industry to expand knowledge and networks, advancing Australia's position as a sustainable, world-leading food industry.

Whether you have years of experience in the food industry, have just started out, or are a student, we have a membership category to suit you.

What's in it for me?

- *food australia* magazine online and printed copies
- Complimentary monthly technical webinars
- Complimentary monthly professional development webinars
- Member rates to AIFST events including the AIFST Annual Convention
- Members-only activities including site and factory tours
- AIFST Community of Interest committee access
- BiteSize e-newsletter including Your Career and Diary Dates
- Members-only website access
- Opportunities to profile your research, business or project through the AIFST digital platforms
- Opportunity to apply for prestigious industry-recognised awards

Visit www.aifst.asn.au or phone +61 447 066 324 to join today!

food australia
OFFICIAL PUBLICATION OF AIFST

Published by The Australian Institute of Food Science and Technology Limited.

Editorial Coordination
Bite Communications

Contributors
Dr Geoffrey Annison, Genevieve Bateman, Hope Bertram, Taryn Blair, Patricia Blenman, Sushil Dhital, Samantha Fewster, Dr Matthew Flavel, Wendy Free, Ghanendra Gartaula, Justine Gayer, Dr Ramon Hall, Chenique van Heerden, Gimantha Jayasinghe, Dr Russell Keast, Dr Barry Kitchen, Dr Gie Liem, Julie McDonald, Chris Preston, Cade Turland, Xin Yang.

Advertising Manager
Clive Russell

Subscriptions
AIFST | aifst@aifst.com.au

Production
Bite Communications

Subscription Rates
Australia $110; overseas (airmail) $175; single copies $27.50; overseas $38.50

food australia is the official magazine of The Australian Institute of Food Science and Technology Limited (AIFST). Statements and opinions presented in the publication do not necessarily reflect the policies of AIFST nor does AIFST accept responsibility for the accuracy of such statement and opinion.

Editorial contributions are invited. Guidelines are available at www.aifst.asn.au.

AIFST National Office
11 Julius Avenue,
North Ryde, NSW, 2113, Australia
Tel: +61 447 066 324
Email: aifst@aifst.com.au
Web: www.aifst.com.au

AIFST Food for Thought

Welcome to the latest edition of *food australia* and my first in the role of managing director. This is a busy time of year at AIFST as we prepare for our annual Convention.

Innovation continues to be a key driver for the food industry both here and globally. It is a theme that provides the focus for this edition, and the key focus for the September convention. The 51st AIFST Convention will be held in Melbourne from September 11-12 at the Convention and Exhibition Centre. The year the convention is co-located with Fine Food Australia, which is another valuable food industry event.

The 2018 Convention theme 'Innovate & Excite: Acting Today to Advance Tomorrow,' focusses on providing tangible and practical information to assist businesses in responding to today's current operating environments, whilst providing insights and information to advance tomorrow. This year's program boasts a wealth of industry professionals who will share valuable learnings with delegates.

A new edition to the convention this year is the 'Ask the Expert' lounge. The lounge will host a range of experts who will meet with delegates and Fine Food attendees seeking solutions or business services. This is a great opportunity to speak to professionals from a range of disciplines.

AIFST also has a range of technical events planned over the next few months around the country working with our Communities of Interest (COI) colleagues. Our webinars continue to be a popular way to uptake your skills and knowledge. Visit our website to see what is on offer as we are adding new events regularly.

We recently announced a national partnership with Foodbank to help address the rising issue of food insecurity and at the same time tackling food waste. Learn more about the initiative on page 9 and on the AIFST website.

'Acting today to advance tomorrow' is key to many issues facing Australia's food industry. Tracking ingredients, waste reduction, recycling, humane food and sustainability are just some of the topics we delve into in this issue and learn more about at the Convention.

I hope you enjoy this edition. If you have not yet done so, I urge you to register for Australia's premier food industry event, and I look forward to seeing you there.

Fiona Fleming
B. App Sc (Food Tech); MNutr Mgt; MAIFST; MAICD
Managing Director
fiona.fleming@aifst.com.au

Takeaway Outlets Fail Health Test

Research from Deakin University has highlighted the fact that at a time when takeaway food is making up an increasing proportion of the average Australian's diet, the majority of Australia's biggest takeaway outlets do not publicly identify health or nutrition as a focus area.

The latest of a series of reports from Deakin University's Global Obesity Centre, *Inside our Quick Service Restaurants*, ranks Australia's 11 biggest fast food companies, not by the healthiness of specific products but according to their policies and commitments to address obesity and population nutrition issues.

The report's lead author, associate professor Gary Sacks from Deakin University's Global Obesity Centre said, "The average Australian household spends almost 32 per cent of its food budget on takeaway and eating out, and the average fast food meal provides up to half of an adult's daily energy requirements."

"Unhealthy diets are creating a public health crisis in Australia. Every part of our community, including the fast food sector, needs to do their part in making the healthy choice the easy choice for all Australians," said assoc prof Sacks.

Scores range from first-placed Subway with a score of 48 out of 100 to bottom-placed Domino's Pizza on three out of 100, with a company average of just 27.

The report made a number of recommendations to the food industry:

* Commit to make healthier meal components, such as water and side salads or fresh fruit, the default option, particularly as part of children's meals
* Set specific targets to reduce the amount of salt, sugar and saturated fat in menu items, and reduce the kilojoule content and portion size of meals
* Reduce the number of price discounts and value deals for unhealthy options, and ensure healthier options are priced similarly to less healthy equivalents
* Restrict advertising of unhealthy products at times when large numbers of children are exposed, including cutting down on sponsorship of community and sporting events popular with families.

Paralympic Athlete Champions Workplace Safety

Paralympic powerlifting champion Kahi Puru is sharing the story of losing a leg after being crushed by a forklift, as part of a program to help drive down injuries and support a culture of safety in the workplace.

Working with the icare Speakers Program, Puru spoke to employees during a safety day at McCain's Lisarow site that was implemented after a maintenance shut down.

"I've experienced first-hand the devastating effect of a workplace injury and the ramifications it has on your loved ones and your workplace. By sharing my experience, I can make people more safety-aware. Being able to prevent one workplace injury is worth its weight in gold," said Puru.

Jason McLaughlin, icare general manager loss prevention and pricing, workers insurance, says "With almost 11,000 people injured in workplace accidents within the manufacturing industry in the last 12 months, there really is no better investment than giving your staff the training and tools they need to operate a safer work environment every day. This program empowers employers to help their employees understand the 'why?' around injury prevention.

"Putting injury-prevention first means employers can increase productivity, improve their return to work outcomes, and ultimately lower their workers' insurance claims and premiums," said McLaughlin.

Paralympic powerlifting champion Kahi Puru.

Lupin Allergen Labelling Now Mandatory

The deadline for lupin to be declared as an allergen on food labels has now passed, meaning that any organisation that has not met this requirement may be required to undertake a food recall.

Lupin is a legume which belongs to the same plant family as peanuts and has the potential to be an allergen. "In Australia, lupin has not typically been used in food, however, due to its high protein and fibre content we are seeing an increase in its use," said FSANZ chief executive officer Mark Booth.

"In 2017, lupin was added to the list of allergens that must be declared on food labels. Food businesses were given 12 months to meet these requirements. Correct allergen labelling can mean the difference between life and death for people with food allergies so it is vital that food businesses get it right." Booth continued.

"Even if the food is not in a package (for example, food prepared at and sold from a takeaway shop), allergen information must be displayed in connection with the food or provided to the purchaser if requested" he said.

Clive Russell joins AIFST

Clive Russell has joined AIFST as our business development manager. Clive has over twenty years experience in sales and account management working with various FMCG businesses including George Weston Foods, Sticky Foods, Balfours, Sargents and Suprima Bakeries where he has been responsible for the management of accounts that include Woolworths, Coles, Metcash, Aldi and various Food Service customers. We look forward to utilising Clive's existing skills and experience to make a continuous contribution to the AIFST company.

AIFST and IFT Announce Key Partnership

AIFST and the Institute of Food Technologists (IFT) have confirmed their shared commitment to supporting professionals working in the field of food science.

IFT has come on board as a Gold Partnership sponsor for the AIFST Convention to be held in Melbourne in September this year.

"We are very excited to continue to build on the already strong relationship that the two organisations share, and we look forward to working closely in partnership with IFT," said AIFST managing director Fiona Fleming.

"The partnership will enable AIFST and IFT to create new and exciting opportunities for our members."

IFT chief executive officer Christie Tarantino-Dean, FASAE, CAE said that sponsoring the 2018 AIFST Convention and partnering on programs beyond the event is a natural fit and will deliver valuable benefits for both organisations.

"This is just the beginning. We are working together to identify meaningful ways to continue supporting the food science professionals we represent as well as academic institutions and the broader industry. We are very pleased to be working collaboratively with AIFST to achieve this outcome," said Ms Tarantino-Dean.

The 2018 AIFST Convention is to be held in Melbourne from September 11 – 12 and promises to be a highlight of the food industry calendar. The theme of this year's convention is "*Innovate & Excite: Action Today to Advance Tomorrow*". It will bring together a diverse range of speakers to inform and challenge attendees.

About the 2018 AIFST Convention

For full details on the Convention program and partnership opportunities please visit the AIFST

Collaborating To Help Manage Food Allergies

AIFST has been invited to join FSANZ' Allergen Collaboration, a group that works to strengthen engagement and collaboration among a range of stakeholders involved in managing food allergens with the objective of supporting consumers to make safer food choices.

In a letter from Glen Neal, general manager risk management and Intelligence, FSANZ recognised the value of AIFST's experience and knowledge in previous and ongoing contributions to the Allergen Collaboration.

More information on the Allergen Collaboration can be found at www.foodstandards.gov.au

University of Adelaide Prize Giving

Dr Steve Lapidge (AIFST), Thu Huong Khuong and Dr Helen Morris.

The University of Adelaide's School of Agriculture, Food and Wine's high achieving students for 2017 were celebrated at a prize ceremony at Lirra Lirra on May 7. Thu Huong Khuong was awarded a pack of AIFST publications in recognition of attaining the highest aggregate in Bachelor of Food & Nutrition Science.

Innovations in Humanitarian Food Science and Technology

In July 2017, a Humanitarian Food Science and Technology working group sat to determine how advances in food science and technology (FST) could be leveraged to help lessen the humanitarian impact of disasters – whether these are natural, short-term disasters or ongoing economic or political turmoil. The engaged, multi-sectoral multi-disciplinary group is run through AIFST.

In 2017 more than 30 million people faced starvation and famine, and more than 2 billion people were affected by micronutrient deficiencies. Providing these people with safe, nutritious, good quality food in the right quantity at the right time in the right place is an enormous challenge, especially when the ultimate goal should be to sustain and ideally improve local food systems, rather than taking the current short-term view on assistance.

FST plays a crucial role in the production of safe, nutritious, stable and convenient to consume foods with an extended shelf life so that affected people are able to satisfy not only their nutritional requirements but also their sensory and cultural requirements.

Following the meeting, the working group made the following recommendations:

1. To increase awareness of the critical role and importance of FST in humanitarian and emergency response among humanitarian stakeholders
2. That policy makers, donors, governments, NGOs and other humanitarian actors recognise that there needs to be a shift in investment policy from the current focus of restoring agricultural production to addressing the whole food system
3. That adequate resources are allocated and investments made in training, education and local capability building with respect to applying FST to address the identified challenges.

Fight Food Waste Cooperative Research Centre CEO Appointed

FIGHT FOOD WASTE
Cooperative Research Centre
REDUCE · TRANSFORM · ENGAGE

AIFST is pleased to announce that the inaugural chief executive officer of the recently funded Fight Food Waste Cooperative Research Centre is Dr Steve Lapidge. Steve, a non-executive director of AIFST, was the bid leader and interim chief executive officer, driving the development of the CRC since 2014. Formerly the director of food safety & innovation within the South Australia Research & Development Institute, Steve took up the chief executive officer position in July 2018.

The Fight Food Waste CRC will involve 60 participants and more than $130 million of resources over the next 10 years. Its objective is to reduce food waste throughout the supply chain, transform unavoidable waste into innovative high-value co-products and engage with industry and consumers to deliver behavioural change.

Winning this fight has a $20 billion annual prize by increasing industry profitability, tackling food insecurity and enhancing Australia's reputation as a sustainable and trusted producer of premium food products.

AIFST is a participant in the CRC and will be directly involved in the FFW CRC Extension Hub that will focus on industry education, training and behavioural change.

Dr Steve Lapidge

Learn more about strategies, innovations and options to minimise food waste and enhance food security from Dr Stephen Lapidge at the Convention.

AIFST Food Science Summer School February 2018

Words by Chenique van Heerden and Taryn Blair

The 2018 AIFST Food Science Summer School was hosted by Curtin University in Perth this year. Students from all over the country, as well as graduates and young professionals came together for three days of workshops and industry visits to learn more about the food industry, promote personal research, improve networking skills as well as get inspiration from academics for those new to or commencing research.

The Summer School had a packed program starting with a welcome function. Eli Wang from Mrs Mac's Pty Ltd, provided invaluable icebreakers to the attendees after being warmly welcomed by Giles Aley (AIFST) and assoc. prof. Stuart Johnson (Curtin University). Pizza courtesy of Chang Wang from D'Orsogna and ice-cold beer from Gage Roads brewery helped to create a wonderful evening while peers, organisers and industry professionals met and mingled.

Thursday provided an early start for a day filled with career presentations, professional development sessions and industry professionals sharing some insights into their daily lives.

Highlights included presentations from:

- Mr Richard Simonaitis, chief executive officer, AEGIC, gave an inspirational view of developing a career in the food industry and explained why our biggest resource of food systems is the Indigenous community of Australia. His speech highlighted that there are opportunities to draw knowledge from reflection on the challenges faced by the indigenous communities in the past and use that to direct the industry in the future
- Assoc. prof. Stuart Johnson reminded us of the importance of working collaboratively with other disciplines, however diverse, and having an inquisitive mind in science research by always asking questions about the questions we are trying to answer
- The 'what happens next' panellists shared insight into the life after graduation. The key message was that it is vital to remain connected with peers, pick suitable supervisors for further research and always ask questions. It was great to hear from Zac Seow, Anchor Foods, Josephine Priscilla, Brownes Foods, Dr Joshua Ravensdale, research fellow, Curtin University and Dr Sabori Mitra, research scientist, AEGIC
- Dr Soumi Paul Mukhopadhyay, DPI NSW travelled all the way to Perth to tell us about her Sensory Evaluation work and the challenges within the role
- Coles Graduate Programs presented by Craig Charles, quality manager WA, SA & NT and Jonathan Ennever, national technical manager of quality at Coles was very interesting and centred on the diverse range of careers that a large corporation can provide, as well as the type of opportunities the Coles Graduate program can deliver
- Dr. Nasar Abbas provided a hands-on workshop with a twin extruder, demonstrating how to make an extruded product with maize and sorghum, while Dr. Tuna Dincer introduced the attendees to the complexities of dairy product judging.

Thursday concluded with a networking BBQ that allowed everyone to reflect on the day while benefitting from the cooking skills of assoc. prof. Stuart Johnson and Dr. Haelee Fenton with sausages, rolls and salad courtesy of Coles, while enjoying a wine or a Gage Roads beer as the sun went down.

Friday's excellent site visits at D'Orsogna with Annie Thompson or CBH with Ian Sproul provided invaluable 'real world' experience to the students in an industrial or research setting and was followed by professional skills workshops in the afternoon with Clare Hay, Curtin Careers and Joe Milton joining us from the Australian Science Media Centre.

The Summer School was concluded by Matt Morisey explaining the hard work and commitment that led to success for Gage Roads Brewery while handing out prizes for the best questions and describing the nuances of Gage Road beers during a tasting session.

Many thanks to Giles, Vicky, Haelee and Stuart for the great program and looking after us for three days.

Chenique van Heerden and Taryn Blair are Food Science and Technology students at Curtain University.

Innovation Key to Authenticity, Transparency and Trust

Words by Dr Geoffrey Annison

Earlier this year I had the good fortune to take part in a panel discussion at a conference in a session on linking consumer perceptions of the food supply chain.

Not surprisingly perhaps, the comments from the audience and other participants lamented the general lack of appreciation by consumers of the technological complexity of the supply chain. This is paired with the low levels of knowledge and scientific literacy which characterises the many public debates and controversies about food, such as how it's produced, packaged and promoted etc.

Concern was also expressed about the readiness of many media commentators to criticise the food industry in support of populist demands most of which come from consumer and public health activists.

The prevailing view was that there is very little awareness of just how safe, nutritious, affordable and accessible Australia's food supply is for the vast majority of Australians.

In fact, judged by the headlines often seen in the popular press, you'd think the food industry is hell bent on producing food devoid of nutrients, crammed full of nasties and force-marketed to our most vulnerable consumers. Whether it be food labelling, added sugars, new technologies, marketing to children, or simply the level of processing, the overall impression is one of widespread community mistrust of the food industry and the integrity of the supply chain.

Of course, this characterisation is an exaggeration. Consumers by and large do show trust in the foods they eat

Putting Humane Food On The Menu

Words by Hope Bertram

An increasing number of Australians are supporting a 'paddock to plate' philosophy when it comes to the food they're eating. We're seeing more interest in how food is produced, and growing support for food that's been farmed humanely. With higher welfare farming increasing in popularity and products now widely available, a growing number of restaurants are finding it easier than ever to source humane food for their menus, and their customers are getting behind them.

So how do you manage the expectations of customers with the cost sensitivity that's a constant for hospitality business owners and managers? Certainly, customers want it but are they always willing to pay for it? RSPCA Australia's humane food manager, Hope Bertram talks about what humane food is, how it's now more accessible than ever and why businesses should be proud to put humane food on their menu.

What is Humane Food?

In a nutshell, there are basic laws around the treatment of farm animals that the RSPCA and many Australians don't think go far enough to give animals raised for food a good life. The standards of production on higher welfare farms go above and beyond those required by law and animals are raised with consideration of their needs as living, feeling beings. For Australia's most intensively farmed animals, it means raising these animals in an environment that enables them to express natural behaviours. For poultry, this means providing space in which birds can flap their wings, scratch and dust bathe and for hens in particular, lay their eggs in a nest. For pigs, it means the ability to move freely without confinement, and space in which they can root, forage and explore, which are all incredibly important behaviours for these inquisitive and social animals.

Is it All About Free Range?

When people think about choosing eggs or meat from humane farming systems, they often focus only on free-range systems which give animals access to the outdoors. While it's not always possible for animals to have

encouraged to be active with proper lighting, perches to build leg strength and dry litter covering the floor for better leg heath and to scratch and dustbathe.

Room to Roam for Pigs

While there's no doubt that bacon and pork products are popular on menus, the most common way to raise pigs is very intensive and raises serious welfare issues. Pigs are known to be smart and inquisitive animals and even sow-stall free products don't always protect these creatures from a life of confinement in a barren environment. Sows – the mother pigs – are confined in farrowing crates where they give birth to their piglets and are then housed in groups in often barren concrete environments. Their piglets may be raised indoors in barren pens or large straw-based shelters.

Putting free range or bred-free range pork on your menu means it's come from farms where pigs enjoyed the freedom to explore, forage and socialise with other pigs. With over 70 percent of processed pork –including ham and bacon – imported from overseas, buying Australian free range or bred-free range pork means you're also supporting Australian farmers in their efforts to improve sow welfare.

The RSPCA is always keen to work with committed people in food service and hospitality who want to make a difference to the lives of farm animals. With more consumers seeking ethically-farmed food, now is the perfect time for businesses to start sourcing humane food, or for those that alreay are, starting to promote the fantastic products on menus.

RSPCA Approved Farming Scheme

The RSPCA Approved Farming Scheme is Australia's leading independent accreditation scheme focused on animal welfare. We work closely with farmers to make a positive impact on the lives of farm animals by providing an environment that meets their needs. Millions of hens, pigs, chickens and turkeys have benefited from better farm conditions since the scheme began. To find out more about the RSPCA Approved Farming Scheme – including information about the RSPCA's standards and RSPCA Approved products visit rspcaapproved.org.au

RSPCA Choose Wisely

The RSPCA's Choose Wisely is an online directory helping customers find eating spots that serve humane food. Businesses listed on the directory use cage-free eggs. If businesses also use higher-welfare chicken and free range/bred free-range pork on their menu they're listed as 'we're humane food all the way' and highlighted as a business that customers should support. Choose Wisely is completely free to use and join. Business owners and managers that want to be recognised for their use of humane food can register online at choosewisely.org.au/join-now. On signing up, the RSPCA will send you a welcome pack with material to show your participation. Follow us on Instagram @rspcachoosewisely

Hope Bertram is humane food manager at RSPCA Australia.

Is Innovation in Australia Really So Hard?

Words by Chris Preston

As a nation, Australia is certainly not lacking in ideas. So, what is holding us back in our efforts to bring new products to market? We have plenty of ideas in our companies, our universities and our research institutions. However, we seem to have a problem translating these ideas into finished goods that reach the market. Instead, we introduce a new lemon flavour to our orange flavour brand and call it 'innovation'. We take such small steps when in fact we are capable of giant leaps.

In my view, there are four factors that underlie Australia's comparative underperformance in innovation. First, as a nation we are risk averse. Secondly, as an industry we do not meet the benchmark of comparable economies for research. Thirdly, as a Government our actions in regulation do not match our rhetoric. Finally, as an economy we structure the retail experience for churn and price, rather than to reward innovation.

It seems we are easily scared in this country. It is a complex world today, and we are reliant on things we barely understand. Immense supply chains reach into the four corners of the globe. We feel insecure because our home interest rates and the price of petrol seem to be connected in ways that make no sense to events far away. We are therefore easy prey to those who wish to peddle fear, uncertainty and doubt, because these have a close affinity with our feelings. This is well summarised by the American economist Peter Huber, in his essay on the policy doctrine of the second best, where he writes that the zeitgeist is "the Panglossian belief that we already live in the safest of all possible worlds, and the Malthusian conviction that the future has nothing to offer but a snake". As a nation, we seem to emotionally fear change and innovation because there is already more than enough 'newness' in our lives with which we have to cope.

Such Luddism is understandable but ultimately self-destructive: as the Luddites themselves found, the tide of history pays no attention to nicer feelings. Importantly for innovators, the key message is that you cannot address emotional concerns with science and facts. A new product may be safe, but not feel safe, especially where fear, uncertainty and doubt have been peddled by those with their own agendas. In bringing innovation to the market, we need to get better at communicating feelings, as well as facts. Innovation can be exciting, challenging, revolutionary, and we need to convey these emotions to our customers to succeed.

Australian research investment by the food sector is less than comparable economies, due to a number of factors. There is precious little tax incentive, for one, an issue on which the AFGC is actively engaging. In my view, though, the fundamental issue is more complex.

The Australian market is seen to be saturated, mature and subject to a retail bottleneck that shows little sign of changing. Compare this to our immediate region, where growth especially in 'middle class' aspiration consumption is soaring. Why would companies invest here when the return is so much greater by investing in Asian growth centres? Australia is, in comparison, high cost, over-regulated and difficult to get to market. To overcome these perceptions, we need to get better at playing to our

At the IFTNEXT stage, speakers addressed a range issues and discoveries on the horizon for food science professionals.

IFT*NEXT* Advances the Science of Food

IFT's bold initiative, IFTNEXT, is designed to inspire innovation and collaboration to find solutions to global food challenges.

Food science is continually progressing as new discoveries expand its scope and knowledge. Once focused exclusively on the study of the physical, biological, and chemical makeup of food, food science has evolved to embrace nutrition, sensory, toxicology, and other areas of study. This evolution led the IFT to update its mission 11 years ago to advance the science of food.

Today, IFT's mission is to 'advance the science of food and its application across the global food system,' and our vision is 'a world where science and innovation are universally accepted as essential to a safe, nutritious, and sustainable food supply for everyone.'

While food scientists can lead the global fulfillment of 'a safe, nutritious, and sustainable food supply for everyone,' we cannot do it alone. It will take collaboration with other scientific disciplines, such as data science, genomics, neuroscience, physiology, biomimetics, sociology, and others as we surmount the challenges of increasing urbanisation and megacities, water scarcity and quality, population growth, personalised nutrition, food waste, obesity, climate change, malnutrition, and more.

Going Boldly into the Future

IFT*NEXT* was launched with the objective to illuminate and provide a forum for these challenges to our community of food professionals. The initiative reflects the next step in our journey to advance the science of food. IFT*NEXT* is about engaging passionate, creative, forward-thinking individuals in conversations and activities that provoke a better understanding of how global, transdisciplinary collaboration can advance and instill innovation in the science of food to overcome real-world challenges.

Food science intersects with many other disciplines, and working in collaboration we can find creative solutions to the most pressing problems, such as feeding nearly 10 billion people sustainably by 2050. IFT*NEXT* will help to

Dietary Fibre Regulations: Is It Time For (A)us To Innovate?

Words by Sushil Dhital[1], Ghanendra Gartaula[1], Wendy Free[2]*

According to FSANZ, dietary fibre is defined as a fraction of the edible part of plants or their extracts, or synthetic analogues that –

(a) are resistant to the digestion and absorption in the small intestine, usually with complete or partial fermentation in the large intestine; and

(b) promote one or more of the following beneficial physiological effects –
(i) laxation;
(ii) reduction in blood cholesterol;
(iii) modulation of blood glucose;
and includes polysaccharides, oligosaccharides (degree of polymerisation > 2) and lignins.

The physiological benefits of dietary fibre are associated with swelling (absorption of water) and solubility (increase in viscosity) of fibres that reduce the overall transfer of food, enzyme and hydrolysed nutrients in the gastrointestinal tract.

For example, the swollen fibre fills the stomach increasing the satiation, thus reducing the food intake. Also, the flow of food from stomach to intestine is slowed (delayed gastric emptying), modulating the glycaemic response. The viscous fibres interact and entrap bile and thus interfere with the re-absorption of cholesterol. In addition, once the fibres reach the colon, they are fermented by the gut microorganisms to produce short-chain fatty acids (SCFAs) such as butyrate, acetate, and propionate. These SCFAs are known to improve the health of colon cells and inhibit the growth and proliferation of tumour cells. Insoluble fibres that are slowly fermented have the capacity to hold a large amount of water (laxation), thereby preventing constipation. Thus, dietary fibres play a very important role in the regulation of human health.

Measurement of Dietary Fibre - Do We Need Changes?

For the food regulation and control systems, physical measurement of dietary fibre is necessary. Quantification of dietary fibre utilises sequential enzymic hydrolysis to firstly digest carbohydrate by alpha-amylase and amyloglucosidase and then by protease to digest proteins. After subtraction of protein and ash, the remaining residue is designated as “dietary fibre”.

FSANZ Code – Schedule 11 describes the method for calculating dietary fibre. It recommends the Official Methods of Analysis of AOAC International (AOAC 985.29 or 991.43) for the measurement of dietary fibre. Both methods use bacterial alpha-amylase and harsh conditions (pH 8.2, 100°C) for the enzymatic incubation step.

This high temperature treatment can gelatinise the enzyme-resistant and non-digestible oligosaccharides leading to the underestimation of total dietary fibre. Most of the granular starch (RS2) or retrograded starch (RS3) that would have survived the human intestinal digestion (resistant starch-RS) is similarly excluded from this calculation. The current AOAC methods 2009.01 and 2011.25 are more reliable as the methods measure the majority of known dietary fibre components in physiological condition using mammalian enzymes.

While these estimates can account for structure, they do not permit estimation of the functionality of dietary fibre, nor are they useful for predicting the calorific contribution of this part of the food matrix. It is advisable that FSANZ replaces the old and multiple methods with the current AOAC methods in FSANZ Code – Schedule 11.

The quantity of dietary fibre may not always be linked to the physiological benefits. For example, consider both white and whole grain bread, each containing 7 g of fibre. Based on the quantification using approved methods eg (AOAC or other methods), both foods can make health claims such as “excellent source of fibre”. However, none of the approved methods are able to quantify the RS1 (physically inaccessible starch e.g

for the implication of these new FDA rule is January 1, 2020.

Calorific Value of Fibres

Although new FDA regulation will create disturbances in the international food market, the regulation will certainly open avenues for new product development, mostly using whole grain foods, where the fibre are both intact and intrinsic. This will likely shift our food production, formulation and consumption trend from a reductionist approach to a holistic approach as reviewed recently[5].

One of the limiting factors of the new regulation is the adoption of insoluble fibre as 'non–fermentable' and soluble fibre as 'completely fermentable' yielding two calories energy per gram of fibre. In practical terms, the demarcation of soluble and insoluble fibre is not possible. Solubility of fibre is a kinetic process and mostly dependant on temperature and relevant association with plant cell wall components. Consider for example, beta-glucans in oat or barley is less soluble at low temperatures compared to high-temperature cooking. So physiologically, a person consuming oat groats in cold milk will have a different nutritional outcome from the beta-glucans than a person consuming oat porridge (cooked in milk).

Also, beta-glucans derived from oat or barley are more soluble than that from wheat, due to the intrinsic structural differences in both cell wall and the molecular compositions.

The estimation of energy contribution will always include a complex set of assumptions. A metabolisable carbohydrate generates 16.7 kJ/g (four kcal/g) of energy in the small intestine. But after they transit to the colon, they act as a carbon source of bacteria. While it is still unclear as to the energy yield of fibres in humans, current data indicate that the yield is in the range of 1.5 to 2.5 kcal/g; (6.3 to 8.8 8 kJ/g)[6].

FAO, however, recommends an allocation of eight kJ/g of dietary fibre, assuming that 70 per cent of the fibre is fermentable. But the new FDA requirements allocate zero calories for insoluble fibre (such as cellulose) and two calories (eight kJ/g) for soluble fibre. The assumption that the insoluble fibres such as cellulose are completely non-fermentable with available energy of zero calories, however does seem compatible with the evidences that shows the partial fermentation of cellulose in the human colon[7].

Conclusions

From the nutritional perspective, the current FDA position is welcomed, as it begins recognition of food as more than the sum of macro-nutrients. Food has structure, and keeping the food structure intact is an ideal way to ensure functional nutrition. FDA clearly states that with some exclusions, there is a lack of evidence of nutritional functionality from the 'added fibres'.

Furthermore, foods that contain naturally occurring dietary fibres also contain nutrients such as minerals, trace elements, vitamins, carotenoids, polyphenols and alkyl-resorcinols that synergise the physiological effects, associated with natural dietary fibres. While molecular approaches may be required to characterise the structure, function and intrinsic biochemistry, they are still under-defined. The inherent complexity of food matrices and the human biome are intrinsically difficult to model, presenting a significant barrier to characterisation and qualification of nutritional claims. It is advisable that FSANZ consider quantification, as well as form and function when defining 'dietary fibre'.

References

1 NHMRC, Eat for Health – Australian Dietary Guidelines National Health and Medical Research Council N55, 2013: p. 44-48.

2 GLNC, The code of practice for whole grain foods. https://www.glnc.org.au/codeofpractice/about-the-code/, 2018. Cited on 22/01/2018.

3 FSANZ, Australia New Zealand Food Standards Code – Standard 1.1.2 – Definitions used throughout the Code. 2017.

4 Food Labeling: Revision of the Nutrition and Supplement Facts Labels. Federal Register-21 CFR Part 101, 2016. Vol. 81(No. 103): p. 33741-33999.

5 Fardet *et al*. (2015). Food & function, 6(2): p. 363-382.

6 Livesey (1990). The *American Journal of Clinical Nutritio*n, 1990. 51(4): p. 617-637

7 Kelleher *et al*.(1984). *Gut*, 25(8): p. 811-815

Dr Sushil Dhital (corresponding author s.dhital@uq.edu.au) and Mr Ghanendra Gartaula are from the Centre for Nutrition and Food Sciences (CNAFS), Queensland Alliance for Agriculture and Food Innovation (QAAFI) at the University of Queensland, Brisbane, Australia. Mrs Wendy Free is from Quality Matters Safety Matters Pty Ltd, Brisbane, Australia.

Innovating Australia's Incident Response Framework

Words by Patricia Blenman

The food industry plays an important role in responding to food incidents as part of our well-developed response framework.

A food incident can occur when there is a possible or confirmed risk associated with a food. This is different to a food recall, although it may be prompted by recalls. It can also result from a foodborne illness outbreak investigation or intelligence from industry.

When a food incident occurs it's important that the food industry and government work together, so quick action can be taken to prevent illness and maintain consumer confidence in the food supply.

During a food incident, governments work together to coordinate their response through the Bi-National Food Safety Network. This is a network made up of FSANZ, the Australian Government Department of Health, the Australian Government Department of Agriculture and Water Resources and the food enforcement agencies of Australian states and territories and New Zealand.

FSANZ's role in this network is to coordinate activities, collate and share information and, in many cases, develop public statements. Food enforcement agencies determine what needs to be done in their jurisdiction and respond according to their food laws, response plans and protocols. By working together, consistent response actions are achieved.

Tracing a food product back to its source at the first opportunity means we can minimise the complexity of the response required and we can act quickly to keep the confidence of consumers and trading partners, minimising flow-on effects.

To facilitate this, a government-industry group, the Food Incident Forum, was established in 2016 to discuss food incidents and issues.

Food Incident Forum

The Forum is made up of Australian food industry associations, groups, sectors and businesses and Australian government food agencies as well as the New Zealand Ministry for Primary Industries. The Forum's Rules of Engagement describe its purpose as a forum for government and industry to share information and collaborate on:

- potential food safety issues to determine if they are food safety issues and how prepared we are should they eventuate
- actual food safety incidents, including the response and recovery.

The extent of active involvement of Forum members will depend on the

Healthy Eating: Growing Trend or Wishful Thinking?

Words by Gimantha Jayasinghe

With today's consumers generally having more access to education and information than any previous generation, the assumption may exist that we are consuming a healthier diet now than in the last few years. In order to test this assumption, a research tool that captures what consumers across Australia eat on a daily basis outside the home was selected. With a robust sample of 60,000 consumers, the research set out to find the answers to two questions:

1. Have we changed our eating habits in the last five years to adopt a healthier eating lifestyle when eating outside the home?
2. Are younger generations consuming more 'better for you' products than older ones?

While the findings did indicate a change in eating habits during that time, it was not in the traditional sense. Consumers have taken a more balanced approach in improving their eating habits as they adopt a more health indulgence culture in Australian foodservice.

Figure 1, highlights the product categories that gained most popularity in the past five years.

Many consumers still want to treat themselves when eating outside the home with fries, burgers and baked goods all seeing the most popularity gains.

On the face of it, many of these product categories may not be perceived as healthier or better for you. However, consumers are expecting a higher quality when they purchase these products than they have in the past, in the form of better meat, better ingredients and more sophisticated flavours.

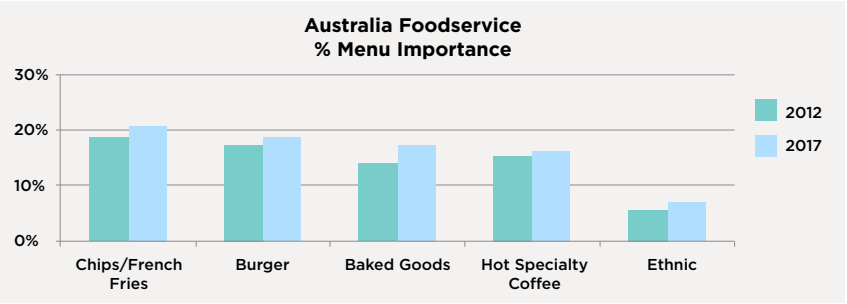


Figure 1. *Source: The NPD Group/CREST® AU, Year End Dec 2017.*

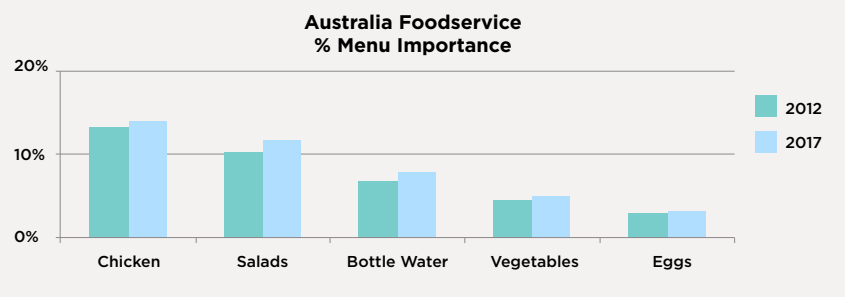


Figure 2. *Source: The NPD Group/CREST® AU, Year End Dec 2017.*

Ultimately, they are consuming more traditionally associated healthier items, but to a lesser extent.

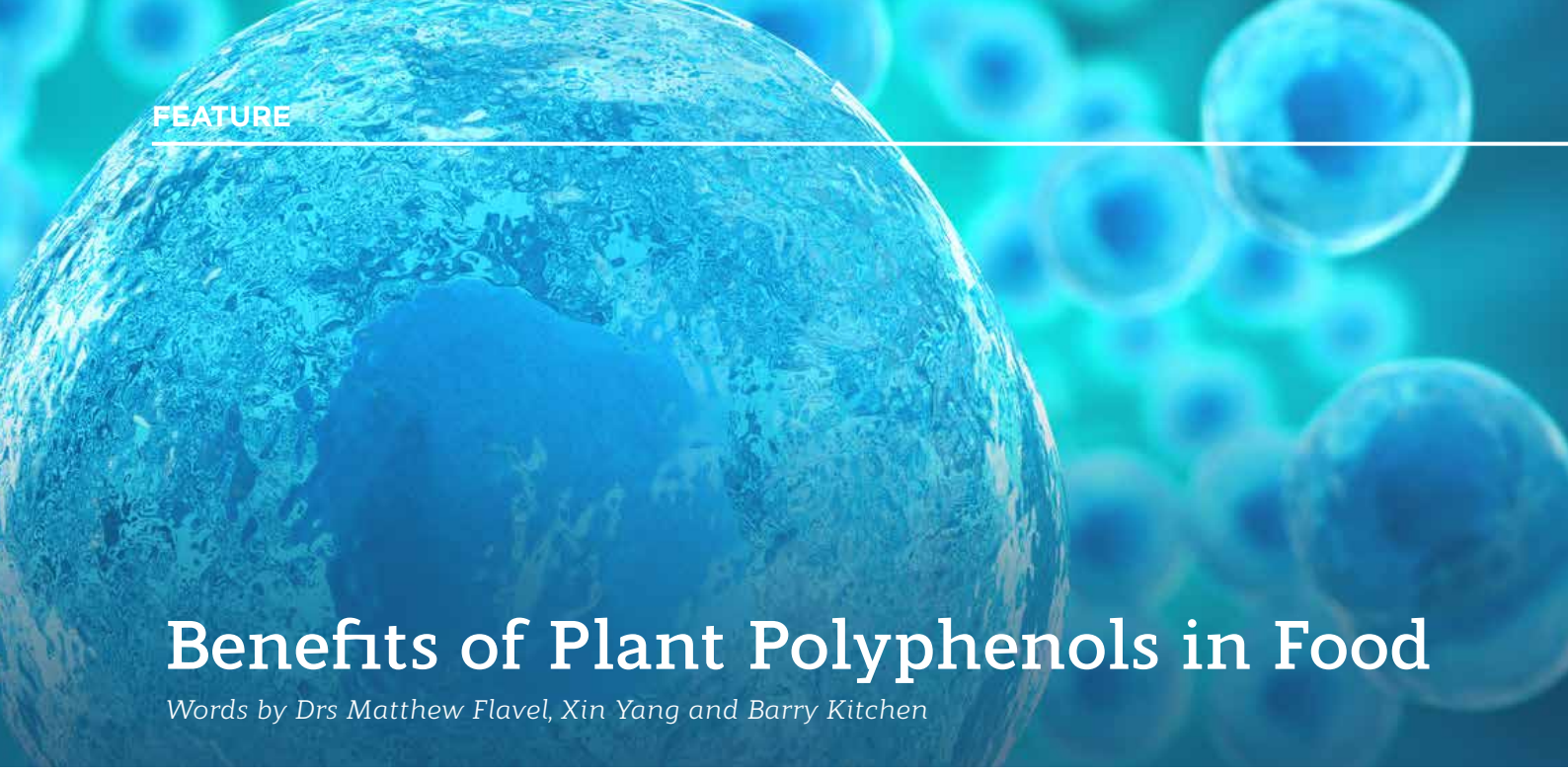
Bottled water witnessed the most growth in this group in the past five years with more presence and variety on the market. Salads also gained in popularity as consumers ordered more for both their main meals and side dishes. For the fruit and vegetables category, growth in consumption of avocado was evident, along with tomatoes and mushrooms.

A more positive trend away from 'unhealthy' foods is becoming evident. Consumers have pulled back from the higher indulgent sides such as desserts and are moving away from carbonated soft drinks in favour of more naturally flavoured alternatives.

So how best can operators and manufacturers best leverage these trends? Mirror the consumer; we too need to take a balanced and innovative approach in our menu options. By catering to the healthy indulgent culture underpinned with better ingredients, we are likely to strike a good medium with the mainstream.

The Generation Game

Today most brands target a specific consumer group or demographic to optimise their revenue and customise the needs to that generation. As



Benefits of Plant Polyphenols in Food

Words by Drs Matthew Flavel, Xin Yang and Barry Kitchen

The inclusion of plant polyphenols in food and beverages may play a role in the battle against oxidative disease.

Oxidative stress is not a new phenomenon, but like much of the stress in the modern environment it can get out of control. Oxidative stress is caused by the generation of free radicals or reactive oxygen or nitrogen species (ROS, RNS)[1]. These compounds are missing an electron and fight hard to source one. Free radicals attempt to secure an electron from our lipids/fat, protein and DNA (our genes). These are the fundamental building blocks of life and therefore damage to them is of serious concern. The role of the antioxidant is to return the missing electron. It is also worth considering the role of food in this process.

It has been reported that degenerative disease, such as cardiovascular disease (CVD) and obesity in England during the mid to late 1880s was only at 10 per cent of current rates, yet intake of antioxidant rich foods that could guard against oxidative stress were at levels 10 times the current intake[2]. It could be argued that many other dietary factors could contribute to this statistic, for example changes in total energy intake or the kinds of macronutrients consumed. However, total energy intake does not adequately explain the increase in modern society, as total calorie intake during this time was on average between 50 and 100 per cent higher than what is currently consumed in England.[2]

The types of macronutrients consumed does not adequately explain the increase of disease either. In most countries a diet high in saturated fat is associated with a high incidence of cardiovascular disease. However, a study published in *The Lancet*[3] reported that in France people have an extremely high intake of saturated fat, yet they do not suffer the rates of coronary heart disease that would be expected from their diet. This phenomenon is known as 'The French Paradox' because it challenges the widespread belief that saturated fat intake is directly linked to cardiovascular disease. One explanation for this paradox is that saturated fat has no relation to the spread of CVD. However, the fact that there is so much evidence globally supporting the link between a diet high in saturated fat and CVD cannot be ignored. The other explanation is that there are components in the typical French diet at a concentration that can help protect against the development of these diseases. It has been hypothesised that the intake of high antioxidant polyphenols in wine may be responsible. For this reason it is important to consider the potential for food to be formulated to have a meaningful impact on disease .

The 2016 Mintel report titled *Food as Medicine*[4] identified 'antioxidant' as a top health claim, alongside the ever-present 'slimming' and 'digestive' claims. The importance of supporting these claims with solid and well communicated evidence was later reinforced in a Mintel report published in April 2018 titled *Nutraceuticals Need To Be Defined And Proven Effective*[5], stating that, "Brands will need to establish their benefits and prove that these products are effective." Effective antioxidants included in food should be made by nature, and proven by science.

However, some critics have questioned whether sufficient evidence backs these claims. Despite this, a large body of research[6] supports the need for food to help protect our bodies from oxidative stress.

Oxidative stress has the capacity to affect every organ and system in the body. It has been linked with everything from Alzheimer's disease, arteriosclerosis, cancer and heart disease, accelerating ageing, asthma, diabetes and leaky gut syndrome[8].

High levels of oxidative stress are detected alongside the full spectrum of chronic diseases and disorders that cause deaths and disabilities. New drugs are being developed and released to address these diseases. However, considering the cost, side effects and pain associated with the diseases and their treatment, prevention is better than a cure[8].

As a result, academia and medical institutions search to find a 'natural'

Q&A

Cade Turland – Hemple

Cade Turland is the owner of Hemple, the Bondi-based hemp food company that came onto the market shortly before hemp foods were legalised for consumption. Hemple offers a wide range of organic hemp products, including hemp oil, hemp seed protein and more. Cade himself has grown up around food, born and raised on a dairy farm in Bowral, NSW. Cade developed an interest in hemp early on, seeing an opportunity to break the stigma and introduce Australians to the nutritional and sustainable benefits of hemp foods.

Q When was the idea of Hemple born?

A Around two years ago I developed a strong interest in the nutritional benefits of hemp foods and cannabis, which manifested when word of the incoming legislation came about. I had a vision to open a company that aligned my own ethos, and let Australians access quality, locally sourced product that carries with it a number of health benefits. This was how Hemple was born.

Q Hemp foods were legalised for human consumption in Australia in November 2017. How was Hemple able to enter the market as a food product in such early stages?

A We made a strategic decision to not do a hard launch for Hemple prior to the legalisation of hemp foods. We held back, despite many local brands selling hemp as a cosmetic ingredient under the Therapeutic Goods Association (TGA) schedule 9 exemption. Many local brands jumped on the bandwagon early, selling their hemp foods as body scrubs and body oils made in a food-grade facility.

We chose to wait and launch properly as soon as legally possible.

Q Are there many hemp food farms currently operating in Australia?

A There are a good number of farmers who are now interested in growing hemp. The timing of the legislation passing last year was quite tricky for the production life cycle in terms of getting new crops planted and cultivated in time, but there is plenty of stock around.

The farmers are excited about the prospects of growing hemp foods. There are many benefits of growing hemp as a rotational crop that can grow alongside other ingredients, such as soy. Hemp is also great for soil health.

Q What is the Australian market like for hemp foods?

A Hemp foods are known globally for having great nutritional properties. Now following changes to the food standards code, the appetite for hemp foods in Australia is growing. More and more hemp food products are being introduced on the shelves, and hemp foods are showing up on café menus. It's such a versatile, nutritious product so the food technology options are endless.

Q What are the nutritional benefits of hemp foods?

A There are many health and nutritional benefits of hemp foods. The ones you hear most about are the high levels of protein and omegas-3 and 6, but there are also high levels of calcium, magnesium, zinc and vitamin B1, making it such a nutritionally broad food with plenty of uses. It can be used to

Innovation in Sensory Science

Words by Drs Russell Keast and Gie Liem

Sensory Outputs of Digitally Immersive Environments

Many people talk about the experience of bringing home food, which tasted fantastic at the holiday destination, but is rather disappointing when consumed at home. Multiple studies have verified that what we taste and like depends on the food as well as the real-life environments in which we consume that food.

The problem, however, is that testing in real life environments is logistically difficult and scientifically challenging. Innovative techniques such as digitally immersive environments, which is a kind of virtual reality (VR), are now applied in sensory science to overcome these problems and challenges.

In a digital immersive environment, consumers wear goggles with a screen, which allows them to look around the immersive environment when they turn their head (360 degree view). The use of immersive goggles mimics a real-life environment while sitting in a lab.

An example of the relationship between our environment and food enjoyment was recently published in *Food Research International*. In this study, participants (n=60) were asked to rate cold and warm drinks on desire and liking, while wearing goggles which showed a beach in a 360 degree view. As a comparison, participants tasted the drinks while either looking at a photo of a beach or just looking around the sensory lab (neutral environment).

It was found that the immersive beach environment increased participants' desire to drink a cold drink, rather than the hot drink. This effect was significantly stronger in the immersive environment, compared with when people just looked at a picture of a beach. There was no difference in desire for hot and cold drinks when people tasted the drinks in a neutral environment. Preference for the drinks was not influenced by the immersive environment, nor the picture of the beach. Unfortunately, the researcher did not test the hot and cold drink on an actual beach setting. It is, however, likely that you have a higher desire for a cold, rather than a warm drink, while on a beach.

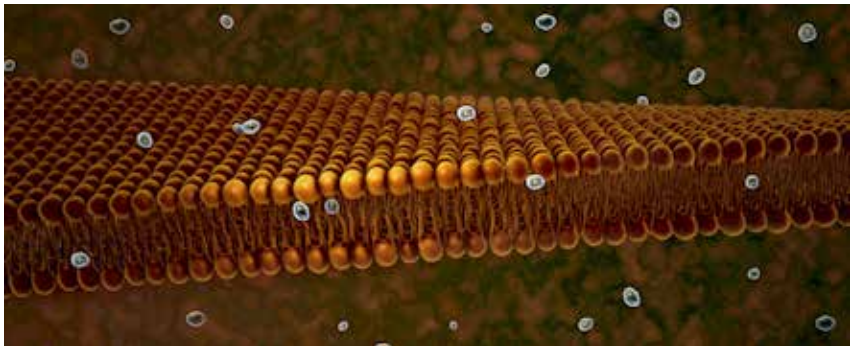
Future studies in this area are likely to focus on using augmented reality (AR) in addition to virtual reality (VR). In augmented reality, a picture of a food is superimposed onto the actual environment. This means that you could sit in a restaurant while the researcher can manipulate what the food on your plate looks like, by just changing the augmented reality rather than the actual food.

Both VR and AR are promising innovative techniques in sensory science.

Andersen I.N.S.K., Kraus A.A., Ritz C., Bredie W.L.P. Desires for beverages and liking of skin care product odours in imaginative and immersive virtual reality beach contexts. Food Research International, in press.

What's New in Nutrition?

Words by Dr. Ramon Hall



Plasma Metabolites and Lipids Predict Insulin Sensitivity

In a collaborative study conducted between Nestlé Institute of Health Sciences (Switzerland); Institut National de la Santé et de la Recherche Médicale (France); Maastricht University Medical Centre (Netherlands) and University of Copenhagen (Denmark), researchers investigated whether they could establish an improved model for predicting improvements in insulin sensitivity (Meyer *et al*., 2018). The study used plasma lipidomics and metabolomics profiles of 433 participants from the Diet, Obesity, and Genes (DioGenes) Study. They utilised the existing Matsuda index model to predict good or poor improvements six months after an eight-week low calorie diet intervention (800 kcal/day). Additionally, there were three independent analyses performed to establish the model defined as: training (n = 119); testing (n = 162) and validation (n = 152).

Overall, the model achieved significantly better performance by including the 27-omic variables. The model was refined and simplified whilst keeping the same level of performance. The simplified model used a baseline Matsuda index, proline, and phosphatidylcholine O-34:1. 0-34:1 and achieved successful validation.

The authors concluded that, "our study proposes a model to predict insulin sensitivity improvements, six months after a low-calorie diet completion in a large population of overweight or obese nondiabetic subjects. It relies on baseline information from three variables, accessible from blood samples. This model may help clinicians assessing the large variability in dietary interventions and predict outcomes before an intervention."

These finding should be of interest to manufacturers of products looking to impact on diabetic risk, as well as researcher and practitioners looking for new models to predict improvements in insulin sensitivity.

Meyer *et al*. (2018) Plasma metabolites and lipids predict insulin sensitivity improvement in obese, nondiabetic individuals after a 2-phase dietary intervention. *American Journal of Clinical Nutrition*, 108: 1-11, (doi: https://doi.org/10.1093/ajcn/nqy087).

Structure-Function Claims on Infant Formula – US Perspective

In a perspective article published recently in the prestigious review journal *Advances in Nutrition*, Wallingford (2018) provides an in-depth analysis of the structure-function claims that are used on infant formula products within the United States. The article provides a historical account of some of the landmark articles published in *The Journal of the American Medical Association* that led up to the US Food Drug and Cosmetic Act in 1938. In addition, the article discusses all of the significant changes that have occurred since the 1938, leading to the current regulatory developments and Governmental guidance documents. Wallingford discusses how the bar on substantiation has been raised in relation to labelling claims, with more focus given to the quality and type of evidence required, as well as the type of endpoints that need to be used to substantiate claims. The article also discusses whether there is a need for new regulations, as well as how the US system relates to the international regulatory environment. Interestingly, the article provides a useful summary of many of the structure-function claims used on infant formula products within the US.

The author concludes that "The origin of SF claims was based in scientific discovery, learning about substances in foods that affect the function of the body and potentially benefit health. As in 1938, there is abundant research of this type continuing today. The 2017 issues of the *American Journal of Clinical Nutrition* contain published articles on functions of oligosaccharides, fibre types, isoflavones, choline metabolites, alpha linolenic acid, catechins, flavanols, and branched-chain fatty acids, among other substances. SF claims are an important way to educate consumers about emerging science and stimulate further research. Questions of substantiation of claims raised by the DG and the viewpoint by Hughes *et al.* should be discussed more generally for conventional foods, while recognizing the unique status of SF claims afforded by statute, explicitly (FD&C Act, DSHEA) or by silence (IFA, NLEA), and should align closely with the FTC standard. Consistent standards can ensure that SF claims across food types are truthful and not misleading and protect consumers' access to new scientific learnings about the functions of substances in foods.

This article should be of great interest to regulatory specialists with an interest in infant formula, as well as manufacturers of infant formula and related products.

Wallingford (2018), Perspective: Structure-Function Claims on Infant Formula. *Advances in Nutrition*, 9; 183-192, (https://doi.org/10.1093/advances/nmy006.)

ILSI SEA Region Meeting

Transformation Technologies And Translational Research

Words by Justine Gayer

Rapid technological advancement in the areas of biomedicine, agriculture and food and nutritional sciences, and translational research of these emerging technologies, presents exciting potential to positively impact the overall food system, the environment, human health and disease prevention.

Understanding the development of these technologies and their applications, as well as public acceptance and societal impact in the coming era, will be critical in bringing science to market to provide better and more sustainable public health solutions. Acknowledging this, the International Life Sciences Institute (ILSI) Southeast Asia Region held a symposium in Singapore on April 23, 2018, titled Transformation Technologies and Translational Research: A New Era in Sustainable Food System and Public Health Solutions, part of their annual meeting.

This symposium highlighted new technology used in agriculture and the food supply chain, environmental science, and health and biomedical research; explored the use of bioinformatics and other innovative digital technologies to capture and analyse data in food systems and public health research; and provided a platform to discuss and enhance multi-stakeholder partnerships in the advancement of new technologies and their applications in food systems.

Dr. Ralph Graichen from the Agency for Science, Technology and Research (A*STAR), Singapore, opened the symposium with his keynote presentation Smart data and food innovation: potential for public health solutions. 'Smart data' is the next frontier for innovation in the food value chain. The sheer volume of data managed and generated every single day is a global phenomenon and brings with it considerable challenges to organisations, starting with a shortage of talent and infrastructure. However, smart data are already paying significant dividends for many industries and are now more and more readily applied in food science, food safety, and in securing the supply chain. Smart data offer increased opportunities in better decision making, helping to uncover underlying trends - from consumer insights, to operational issues, to innovation. Everything from data policies, collection and access, management and infrastructure need to be addressed in the context of privacy, security, liability, and intellectual property.

An evolutionary perspective on nutritional and human health was presented by professor Richard Head, University of South Australia. Humans have demonstrated remarkable inventive skills in and around the fundamentals of sustenance, mobility, shelter, and communication. In nutrition and particularly in nutritional deficiency states, the molecular characterisation of the single bioactive and the demonstration of efficacy has been a fundamental contributor to our knowledge and wellbeing. The challenge will involve further evolution of the scientific method to meet an individual need for personalisation, clarity, and convenience from this scale and complexity, with the appropriate level of sophistication.

Transformation Technologies in Food Systems

Dr. Chor San Khoo, ILSI North America, noted in her presentation Technology innovation: trends that are reshaping life sciences and health that the convergence approach has led to the proliferation of a new field of 'biologically-inspired engineering', an offspring of unification between the applied and physical sciences, engineering, computational and data sciences, which is accelerating the development of novel and precise technology/tools for exploring biological systems and mechanisms. Often, convergence results in unexpected and synergistic transformations. In the food and nutrition fields, the convergence approach has yet to be fully applied. Novel tools and technologies emerging from bio-inspired research and combination technology breakthroughs need to be explored for opportunistic applications in food and nutrition.

Today we face the challenge of how to sustainably feed the global population projected to increase to nearly 10 billion people by 2030. This will be accompanied by an increasingly ageing demographic profile, elevated health burden from diet and lifestyle-related chronic diseases, and likely impacts on food production from climate change and other environmental challenges. Growing demand from consumers across countries for foods with demonstrated health benefits is coupled with the digital explosion of data from populations relating to monitoring health and lifestyle behaviours. Dr. Chris Downs, CSIRO Agriculture and Food, highlighted CSIRO's new developments in elite grains and other crops, including consideration of new technologies and the likely impacts on nutritional profiles under a range of possible climate change scenarios. Dr. Downs also presented innovative processing technologies which can further modify nutritional profiles and physical functionality of new and existing grains. Professor Lynne Cobiac, CSIRO Health and Biosecurity, discussed how an inadequate/inappropriate diet is a major risk factor contributing to the burden of chronic diseases and a major determinant of the health of our gut microbiome. When planning for producing food in the future, all these factors need to be integrated into one trans-disciplinary framework including industry, government, and research partnerships. CSIRO's newly announced

our own development and diseases and enabling novel biotechnological innovations. However, we are witnessing yet another revolution with the rapid development of powerful genome engineering technologies, in particular CRISPR (clustered regularly interspaced short palindromic repeats)-Cas systems. While sequencing allows us to read the genome, CRISPR-Cas empowers us to write and redesign the underlying DNA. Professor Meng How Tan, Genome Institute of Singapore, discussed the development and applications of CRISPR-Cas systems as novel tools for sculpting the complex genomes of plants and animals, including humans. He outlined the challenges that the technology is currently facing, describing some solutions to solve these problems, and sharing thoughts on how the agriculture and healthcare industries may be disrupted in the future.

Transformation Technologies in Food Safety

Food safety is a global concern and the current estimated global burden of foodborne disease from microbiological food safety problems and the related social and economic costs remains high. In outbreak investigations, challenges remain in linking illness to particular foods and ensuring the appropriate products are recalled. Dr. Masami Takeuchi, FAO Regional Office for Asia Pacific, highlighted genome sequencing as one such tool that offers great potential for various food safety regulatory activities including food inspection, outbreak detection/investigation and studies on antimicrobial resistance. Such benefits could significantly contribute to protecting public health and food security as it can save lives and prevent economic losses and food waste due to incorrect or imprecise implications of wrong products and commodities. FAO has developed a technical paper on the application of Whole Genome Sequencing in food safety management and convened a global meeting bringing together 175 participants from 50 countries, half of which were developing countries. The organisation continues to address the needs and concerns that developing countries may face regarding this technology.

Food allergies caused by proteins are globally on the rise while at the same time novel or alternative protein sources enter the market and need to be tested for safety. Previous FAO/WHO guidelines for computational assessment of allergenic potential of proteins based on single hexamer peptide hits and linear sequence window identity thresholds produced a large number of false positives. At the same time, true similarity in protein sequence and structure between allergens and non-allergens introduces yet another challenge to similarity-based methods for classifying allergenic proteins. Dr. Sebastian Maurer-Stroh, A*STAR Bioinformatics Institute, Singapore, and his team have revisited the sequence and 3D structure features of known allergens to derive and test enhanced prediction methods. Testing for allergenic potential of proteins using this novel computational workflow early in food production planning and product development can dramatically reduce costs and risk for food companies.

The symposium concluded with a panel discussion highlighting the importance of multi-stakeholder partnerships in the development and application of new technologies in the food system. For more information visit ILSI Southeast Asia Region's website www.ilsisea-region.org

Justine Gayer is manager, scientific programs (Nutrition)/ Communications, International Life Sciences Institute, Southeast Asia Region, Singapore.

What if we could predict disease before it occurred and have the right food supply to keep all of us healthy? This is the long term ambition of the Precision Health Future Science Platform that has just been funded by CSIRO.

But what does Precision Health mean? In a nutshell, it is about us all being empowered to proactively manage our own health everywhere we go.

How does it happen?

- Better predicting and delaying the onset of chronic disease: Through harnessing the data from individuals and the health system we can help make people healthy and keep them healthy
- Moving away from a one-size fits all: By having a deeper understanding at the individual level of how our genetic background, the way our body works, the impacts of our environment, our diet and lifestyle activities, as well as our personal choices and preferences, means that we can design and validate foods, digital tools, lifestyle programs and products that will have the greatest chance of keeping us healthy – because they will be more tailored to individual circumstances
- Integrating data to build personal health profiles: Through the advances in data collection by individuals (think personal monitors), the health system (think electronic medical records) and data analytics (think machine learning and artificial intelligence) combined with fast developing technologies (think genomic sequencing and other 'omics such as epigenomics and the microbiome)

Where does food fit in? What we eat and drink is a critical determinant of our health status, so Precision Health is investing in developing novel healthy grains and foods in a sustainable manner and with proven health benefits.

What do we mean by a Future Science Platform? Creating new and inventive science that has the potential to create new or reinvent existing industries in Australia and build capability to help position Australia to be globally competitive.

Interested in finding out more? Contact professor Lynne Cobiac, Director Precision Health Future Science Platform, CSIRO. Lynne.cobiac@csiro.au

AIFST CONVENTION
MELBOURNE | 11-12 September 2018

Join Australia's food industry professionals!

For another unforgettable AIFST Convention.

The 2018 Convention will be held at the Melbourne Convention and Exhibition Centre, co-located with Fine Food Australia, from 11-12 September 2018.

The 2018 Convention theme *Innovate & Excite: Acting Today to Advance Tomorrow,* focusses on providing tangible and practical information to assist businesses in responding to today's current operating environments, whilst providing insights and information to advance tomorrow.

This year's convention has a brand new and exciting format that will give delegates the opportunity to participate in panel discussions and practical workshops; seek business solutions and assistance in the new *Ask the Expert Lounge;* and network with the broader food Industry.

Don't want to miss out on the 2018 AIFST Convention? Visit the AIFST website to register.

www.aifst.asn.au

JJT GROUP
WE.VALUE.VALUES.

ROHA
A JJT Group company
INNOVATING FOR YOU. WITH YOU.

NO MORE BOTTLE NECK FOR THE BEVERAGE INDUSTRY.

Roha's Ultima Yellow brings a range of yellow-orange shades to the beverage industry while eliminating neck ringing in beverages. This natural color based innovation prevents the formation of the oily ring that can appear on bottle-necks during long term storage resulting in a consistent final shade and appearance in the application.

Furthermore, Ultima Yellow readily disperses in beverage applications while remaining bright and stable even under conditions of heat treatment, extended exposure to light or fluctuations in pH. With the right dosage of Ultima Yellow, the perfect yellow-orange shade can be achieved.

NATRACOL
COLORS INSPIRED FROM NATURE

Roha (Australia) Pty Ltd - 29 Fiveways Boulevard, Keysborough, Victoria 3173, Australia.
T: +61 3 9729 0302 | E: roha.australia@rohagroup.com | www.roha.com