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A $3.9 million project will complete the transformation of the QUT Mackay Renewable Biocommodities Pilot Plant (MRBPP) into a state-of-the-art, food-grade-compliant facility which will be designed to enhance Australia’s ability to produce novel food ingredients.

Professor Ian O’Hara, who led the development of the MRBPP more than a decade ago, said the co-investment between QUT and Australia’s Food and Beverage Accelerator (FaBA) would expand the facility’s capability and allow companies to fast-track product development in the food and beverage sector.

“This project is part of an overall $16 million upgrade to the facility to be completed this year which will transform the pilot plant into Australia’s leading physical containment level 2 (PC2) large-scale, food-grade research translation facility,” O’Hara said.

“This will enable the production of novel food and beverage ingredients via precision fermentation and boost product development by providing a unique capability to undertake early-stage scale-up, reducing cost and timeframes for getting new products to market.”

“Precision fermentation allows us to manufacture new high-value food ingredients like proteins that can boost our bioeconomy in Australia and provide new domestic and export opportunities for our agricultural and food and beverage industries.”

The QUT research team involved in the project includes Professor O’Hara, Professor Jolieke van der Pols, Associate Professor Mark Harrison and Dr Jo Blinco.

Precision fermentation is a technology that allows us to convert sugars into a range of other food ingredients and products in brewery-style fermentation tanks.

Unlike traditional fermentation, which is used to make products such as beer and yoghurt, precision fermentation tunes the microorganisms to produce specific enzymes, fats or proteins and allows the team to do this at large scale.

“The advantages of precision fermentation are that it can lead to new food products and ingredients that are not possible to produce through traditional methods, providing sustainability benefits and increasing consumer choice,” O’Hara said.

Dr Chris Downs, FaBA Director, said the Accelerator had invested in the pilot plant to enable industry to scale and ensure onshore production of innovative ingredients.

“The pilot plant has the potential to help cement Australia’s position as a leader in the development of ingredients from precision fermentation,” Downs said.

FaBA is hosted by The University of Queensland, in collaboration with partners QUT, the University of Southern Queensland and UniQuest. It is supported by the Australian Government’s Department of Education through the Trailblazer Universities Program.

In addition to the investments by QUT and FaBA, the Mackay Pilot Plant upgrade is being supported by the Australian and Queensland Governments through the Regional Recovery Partnerships Program and the Queensland Government Department of State Development and Infrastructure through the Industry Partnership Program.
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Three key trends driving the local food & beverage industry in 2024

Emma Stride, Business Development Director, Taste, Kerry Australia and New Zealand (ANZ)

Consumer behaviour has changed significantly in recent years and continues to evolve rapidly, influencing food and beverage trends. Personal health, sustainability and enhanced sensorial experiences are the biggest consumer themes that will shape the food and beverage sector across the region.

Recent Kerry proprietary insights on the future of food and beverages show that consumers in ANZ continue to prioritise their personal health by placing more importance on self-care. They are also adapting to a more sustainable lifestyle that focuses on conscious consumption and knowing where their food comes. At the same time, new sensorial experiences, particularly around international flavours, are in demand.

But how can product and menu developers tap on these trends to develop food and beverages people want? Understanding the flavours, ingredients and trends that will shape what we consume is essential in guiding successful food innovation.

Consumers love international cuisines

The Asia-Pacific consumer is heavily influenced by the region’s diverse cultural traditions and we see this in the rise of international flavours in the ANZ Taste Charts. According to Kerry research, Asia-Pacific consumers are rediscovering the magic of their own culinary heritage while looking for unique regional ingredients and flavour profiles. Findings from FMCG Gurus on innovative flavours mirror this, with 55% of consumers worldwide rating traditional flavours as a key influence on their food and drink choices.

According to insights from Kerry’s 2024 ANZ Taste Charts, international cuisine flavour teriyaki is now a key flavour in the savoury category, moving up from the up-and-coming list. Other regional flavours that are gaining prominence include matcha and Korean gochujang, which are now up-and-coming, having grown the fastest in the past three years. There are also new flavours debuting in the emerging list such as kimchi and bulgogi in Australia, and miso and Jamaican jerk in New Zealand.

Elsewhere in Asia-Pacific, there is also growing consumer interest in fermented foods and the health benefits they offer — which include antioxidant to anti-inflammatory properties — leading to innovative dishes like charcoal-grilled skewers with fermented chilli paste. By harnessing the depth and complexity that fermented flavours bring, industry players can create products that satisfy the consumer craving for modern updates of their favourite traditional food.

Hot and spicy, and BBQ flavours are on fire

Kerry insights show that consumers are developing sophisticated taste preferences, and bold flavours like hot and spicy as well as those with barbecue taste profiles appeal to many.
Smoke and grill flavours have always had a place in many markets and across different applications. While the demand is widespread across the globe, cooking over a hot grill or barbecue is part of the Aussie and Kiwi DNA.

Kerry’s proprietary insights show that chargrill, barbecue, smoke and smoky barbecue continue to be mainstream flavours in the ANZ Taste Charts, particularly in the savoury and salty snack space. The use of specific smokes is also gaining popularity in the region, with mesquite, applewood and hickory smoke emerging on the charts.

Across Asia–Pacific, people are replicating ethnic dishes they sampled during their travels — many of which are hot and spicy — resulting in diversity across markets. In ANZ, chilli, ghost chilli, jalapeno chilli, chipotle chilli and habanero chilli are trending. Meanwhile, consumers in Indonesia enjoy crispy prawn chilli, ghost pepper, Korean buldak sauce and jalapeno chilli. This reinforces the desire for complex and nuanced heat experiences that offer authentic and exotic flavours, particularly region-specific spices, chillies and hyperlocal flavours.

**Wellness and sustainability influence dietary habits**
The emphasis on self-care has evolved from mere health-consciousness to prioritising health in food choices. A FMCG Gurus report on consumer perceptions on health and wellness shows that 68% of global consumers have actively sought to improve their diet in the last two years.

The Asia–Pacific region is unique in that consumers view sustainability and transparency as inherent to their wellbeing — the source of their food directly influences the quality of their health. The preference for local ingredients is strong; in ANZ, beverage flavours such as mango, kiwi, peach, passionfruit, pomegranate, grapefruit, blackcurrant and honeydew are trending, indicating a resurgence of pride in local ingredients. This holds potential for innovation in sustainable flavours and solutions — people want food that supports their health and that they feel good eating.

The data also reveals a rise in functional flavours in beverages. Honey, manuka honey, almond, matcha, turmeric, rosehip, elderflower and acai are piquing interest for their perceived health benefits, and this is evident in drinks such as lemongrass tea and turmeric latte; similar preference goes for beverages that boost mental alertness and physical performance.

Fruits such as yuzu and passionfruit are also coming to the fore. Yuzu is gaining traction as an emerging flavour in ANZ, appearing in multiple categories from savoury and salty snacks to hot and cold beverages. Demand can also be seen in recent launches like Yuzu low ABV wines and alcoholic beverages in Australia, in Yuzu Gose beers in South Africa and yuzu and pepper mayonnaise in China. Cold beverage passionfruit flavour appeared in 13 different global regions in Kerry’s Taste Charts, with passionfruit already a mainstream ingredient in New Zealand.

When it comes to plant-based products, health and sustainability concerns continue to be driving factors, but now novel flavours in meat and dairy alternatives are capturing consumer tastes. This has led to the launch of foods like jackfruit rendang in Indonesia, mushroom jerky in Australia and chickpea falafel with a Middle Eastern twist.

**Understanding and delivering on market preferences**
Today’s rapidly changing times often present challenges for food manufacturers and brands trying to deliver food and beverages people value. People have always been led by taste, especially when buying a product. Year on year, Kerry Taste Charts have become a reference tool for various stages of product development, whether brands are looking to add new offerings or check if their current product flavours are still in demand. Awareness is key; knowing that savoury flavours typically common in food are entering the beverage category for instance, can help influence innovation and development and help manufacturers identify where they can add the most value for their consumers.

*Kerry Taste & Nutrition (APMEA)*
www.kerrygroup.com
New inquiry — the role of Australian agriculture in Southeast Asia

The Australian Parliament’s Agriculture Committee has commenced an inquiry into the role of Australian agriculture in Southeast Asian markets and is calling for submissions from interested stakeholders.

Committee Chair, Meryl Swanson MP, said the Australian Government has prioritised a deepening engagement with Southeast Asia, and noted from the recently released Invested: Australia’s Southeast Economic Strategy to 2040 that Southeast Asia is at the centre of global growth.

“Agriculture plays a critical role in sustaining the region’s economic growth. With its continuing population growth, rapid urbanisation, rising incomes and increasing food security requirements, Southeast Asia is one of the fastest growing markets for Australian agricultural exports,” Swanson said.

The committee will examine the role of Australian agriculture in Southeast Asian markets in the context of the recommendations in the economic strategy. It will focus on how Australian agriculture can support Southeast Asia’s food security, improving market access and trade systems, and building capability in the region to improve agricultural sustainability, technology and innovation. It is also interested in identifying new mechanisms and emerging opportunities and challenges for Australian agriculture to address key priorities in the Southeast Asia region.

Submissions to the inquiry will be open until 31 May 2024.

Inghams to buy NZ’s organic chicken producer Bostock

On 7 March 2024, Inghams Group Limited announced its intention to acquire the Bostock Brothers (BBL) organic chicken business in New Zealand for NZ$35.3 million (approximately AUS$33.0 million). The company plans to acquire 100% of the shares in BBL, including the brand with respect to poultry products, three freehold farming properties and the primary processing plant.

Established in 2014, BBL is a certified organic producer of poultry in New Zealand with its operations located in Hastings, on the central east coast of the North Island, approximately four hours from Inghams’ Waitoa operations.

Inghams CEO and Managing Director Andrew Reeves said: “With the strong recovery in operational and financial performance of our New Zealand business, this acquisition represents a unique opportunity to further enhance our capabilities, extend our range and advance our plans for the business.”

Commenting on the acquisition, Edward Alexander, Inghams Chief Executive, New Zealand, said: “The addition of the highly regarded premium Bostock brand and team strongly aligns with our objective to establish Inghams as the leading premium operator in the market.”

Fully funded from existing debt facilities, the acquisition is contingent upon the satisfaction of conditions, including with respect to the Commerce Commission and Overseas Investment Office.

Completion of the acquisition is expected by end September 2024.

Unilever demerges its Ice Cream operations

The separation of Ice Cream is designed to assist Unilever with the implementation of its Growth Action Plan (GAP), announced in October 2023. The plan is focused on doing fewer things, better and with greater impact to drive consistent and stronger topline growth.

The company is confident that the future growth potential of Ice Cream will be better delivered under a different ownership structure. Ice Cream has distinct characteristics compared with Unilever’s other operating businesses. These include a supply chain and point of sale that support frozen goods, a different channel landscape, more seasonality and greater capital intensity.

The separation of Ice Cream will create a business, operating in an attractive category, with brands that together delivered turnover of €7.9 billion in 2023. The business has five of the top 10 selling global ice-cream brands including Wall’s, Magnum and Ben & Jerry’s, with exposure in both the in-home and out-of-home segments across a global footprint.

Under new leadership, Unilever’s Ice Cream is already making operational changes that are expected to drive stronger performance. These include improved productivity and efficiencies, product rationalisation and investment behind innovations.

As a standalone, more focused business, Ice Cream’s management team will have operational and financial flexibility to grow its business and further optimise its manufacturing and logistics network.

Separation activity will begin immediately, with full separation expected by the end of 2025.
Government launches inquiry into food & beverage manufacturing

Following a reference from the Minister for Industry and Science, the Hon Ed Husic MP, on 18 March 2024, the House of Representatives Standing Committee on Industry, Science and Resources has commenced an inquiry into food and beverage manufacturing in Australia.

The inquiry will look at opportunities for expanding innovation and value-adding in the food and beverage manufacturing industry in Australia, with regard to:

- innovation trends and new technologies, both locally and internationally;
- ways to support new and emerging products and industries, including premium and niche products, new proteins and Indigenous foods;
- opportunities across both domestic and export markets for Australian manufactured products, including shifting consumer trends;
- approaches to circular economy, waste reduction and decarbonising, including packaging and food waste;
- how the research sector can help to grow this ecosystem; and
- mechanisms for the Australian Government to support further innovation and sustainable growth in the sector.

The Chair of the committee is Rob Mitchell MP, Australian Labor Party, while Deputy Chair is Hon Michelle Landry MP from Liberal National Party of Queensland. Other committee members include: Alison Byrnes MP, Zaneta Mascarenhas MP, Henry Pike MP, Dan Repacholi MP, Maria Vamvakinou MP and Rick Wilson MP.

Mitchell said, “The inquiry will examine the state of innovation in the industry, including new technologies for post-farmgate food and beverage manufacturing and packaging, and opportunities for growth in new product markets. It will also consider shifting consumer trends, the role of the research sector and future workforce needs.”

The committee wants to hear from large and small manufacturers about their experiences, hopes and fears for the future. They are also looking for the views of experts in food science, process engineering and packaging.

Written submissions addressing any or all of the inquiry terms of reference can be submitted by Wednesday, 1 May 2024.

For information on how to make a submission, visit the Making a submission to a committee inquiry page.

Supermarket inquiry: Food and Grocery Code of Conduct

In April, an interim report about the review of the voluntary Food and Grocery Code of Conduct (the Code) was released by the Independent Reviewer, Dr Craig Emerson.

There were eight firm recommendations, including that the Code be made mandatory and enforced by the ACCC with penalties of $10 million or more for serious breaches. Emerson said making the code mandatory was essential to deal with the heavy imbalance in market power between the major players — Coles, Woolworths, ALDI and Metcash — and their smaller suppliers.

Firm recommendations were made to strengthen protections for suppliers against possible retribution from supermarkets, including a new mechanism for making confidential complaints to the ACCC.

Critics of the Code being made mandatory argue that the only recourse for a small supplier adversely affected by a breach of the Code would be a lengthy ACCC court action, by which time the supplier would have gone broke.

But Emerson concluded it was possible to obtain “the best of both worlds” with a low-cost alternative to court proceedings. This would involve replicating options for independent mediation and arbitration that are used in other industry codes.

There were three other recommendations on which stakeholder views have been sought.

The final report will be provided by 30 June 2024.

Fonterra’s trans-Tasman merge

Fonterra is integrating two important parts of its business — Fonterra Brands New Zealand (FBNZ) and Fonterra Australia. Together, this part of our business will be known as Fonterra Oceania.

The merge is designed to strengthen Fonterra’s trans-Tasman offering, which is described as an increasingly competitive marketplace.

“Our businesses in Australia and New Zealand have many complementary aspects and integrating them builds on these strengths,” the company spokesperson said.

“FBNZ comprises our consumer brands and foodservice businesses here in New Zealand, including brands Anchor, Mainland and Kāpiti, which will continue to utilise our New Zealand farmers’ milk.

“The Australian milk pool will continue to provide the milk solids for our Australian brands and ingredients.”

The integration of FBNZ and Fonterra Australia will be effective from 1 May 2024 with René Dedoncker to lead the new Fonterra Oceania team.
Fonterra’s ingredients and solutions brand, NZMP, has launched a tool to help its customers access the emissions profile of individual New Zealand NZMP products.

The NZMP Carbon Footprinter can provide access to the latest emissions data for the major NZMP New Zealand products — including whole milk powder, skim milk powder, butter milk powder, milk protein concentrate, butter and anhydrous milk fat, and natural and processed cheese. It can also forecast potential emission reductions for those products out to 2030, which are based on the assumption that Fonterra successfully achieves its climate targets.

Fonterra’s Director of Sustainability, Charlotte Rutherford, said the online calculator is one way the dairy co-operative can help its customers understand how Fonterra’s climate targets relate to the products they purchase.

“We know that for many of our customers we are a large part of their Scope 3 emissions. The transparency of the footprinter means they can easily assess with confidence the latest emissions profile of the product they purchase from us,” Rutherford said.

Carbon footprint certificates can be requested for specific New Zealand NZMP products, which have been independently verified by globally recognised sustainability accreditor Toitu-Envirocare.

Americold, a global provider of temperature-controlled storage solutions, continues its commitment to growth in Australia with the recent opening of its facility in Spearwood, Western Australia.

This temperature-controlled warehouse is claimed to be the largest of its kind in the region and boasts advanced automated storage retrieval system (ASRS) technology. The Spearwood facility joins four other major Americold automation deployments globally in 2023.

Strategically located for easy access to Fremantle Port, the Spearwood facility has a range of features tailored to meet the diverse needs of producers, retailers and consumers alike. From controlled product tempering and blast freezing capabilities to certification for import/export operations and advanced inventory management systems, the facility is equipped to support various industries and logistical requirements.

Nestlé Australia has announced a $32 million investment in its Smithtown factory, which manufactures Milo — bringing investment in the site to approximately $80 million in the last decade.

The investment will upgrade the Milo manufacturing line, introducing state-of-the-art manufacturing technology to the factory and supporting an increased production capacity.

The Nestlé Smithtown factory, which has been operating for over 100 years, today employs more than 200 people and produces more than 200,000 cans of Milo, as well as Nesquik, Nescafé mixes and Malted Milk.

Previous investments in the site include $2.5 million in early 2023 to allow for collaborative product developments and $40 million to build a production facility for Nescafé coffee mixes in 2014.

Factory Manager James Garley said the latest investment in the site reflects Nestlé’s commitment to supporting local manufacturing.

The upgrade is due to be completed by the end of 2024.
UNSW researchers have developed a low-energy technique to recycle plastic more often into new packaging, which could soon be used for Tim Tams.

The researchers said the new method — which can be used on a wide range of common materials such as bags, bottles made from polyethylene, polypropylene, polystyrene and PET — has the potential to significantly reduce the degradation of the plastic (polymers) during recycling. Therefore, it could be possible to recycle the plastic a higher number of times than using existing recycling processes.

PET is one of the world’s most commonly used plastics with approximately 10% of all plastics being made from PET, with around a third of that used in global food and beverage packaging.

The primary challenge is the level of contamination in such plastic, making it harder to recycle without being thoroughly cleaned.

The new UNSW method is designed so that it doesn’t need extensive cleaning. It also has the potential to separate the polymer from various additives such as dyes so it is capable of producing recycled colourless PET from coloured waste sources at low energy.

Team leads Professor Per Zetterlund and Dr Vipul Agarwal, from the School of Chemical Engineering, are working in collaboration with ‘impact investment’ firm FP Paradigm to further develop and commercialise the technology specifically pertaining to PET (polyethylene terephthalate) recycling. The relevant aspects of the UNSW patent (PET in food and beverage applications) have been licensed to FP Paradigm.

Paco Industries, the R&D subcontractor for FP Paradigm, has recently announced a deal with the Arnott’s Group — makers of Tim Tams and Shapes — to explore the use of this new technology as a more sustainable PET alternative across its range of products.

Arnott’s Group Chief Transformation Officer Simon Lowden said: “This agreement reflects our commitment as a business to go beyond our sustainable commitments and find new technologies — so that the Arnott’s Group can continue to create delicious moments, not just for our consumers, but for our value chain and planet as well.”

In addition to the deal with Arnott’s, Paco has also facilitated an agreement with Sydney-based, sustainably focused coffee company Pablo & Rusty’s to assist with the commercialisation of the UNSW-developed recycled PET.

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Paper packaging for potatoes bags an APPMA award

South Australian packaging company Detpak received the APPMA Packaging Design Innovation Award in Melbourne on 13 March 2024 for its Kerbside Recyclable Paper Bag for fresh potatoes.

Detpak, a subsidiary of the South Australian third-generation, family-owned Detmold Group, has been recognised for developing what is claimed to be Australia’s first kerbside recyclable paper bag for fresh potatoes, in collaboration with national leading potato and onion producer Mitolo Family Farms and Coles.

Following three years of development, the paper-based bag was launched last year for Mitolo’s Gourmandine potato range, reducing plastic usage by 64%, equating to 8.2 tonnes less plastic each year.

Detpak’s RecycleMe technology is designed to maintain product quality and extend shelf life, and offers kerbside recyclability, aligning with Australian Packaging Covenant Organisation guidelines.

Roman Bolzon, Detpak General Manager – Sales, said the APPMA award was a great achievement for Detpak, which is aiming to replace all 100% plastic packaging in fresh produce and help set the stage for industry-wide transformation.

“Detpak is proud to be part of a collaborative groundbreaking packaging design solution that is leading a broader shift towards sustainable practices in the grocery sector as consumers become more environmentally conscious,” Bolzon said.

“We are always looking at innovative ways to drive sustainable change across the packaging industry and are continuing to evolve packaging to be better for our environment,” he said.

“We would like to thank APPMA for the award, and sponsor Ranpak, for recognition of our contribution in sustainability and packaging across Australia.”

In the past two years, the Detmold Group’s commitment to developing sustainable packaging solutions has seen the company:

• work with giant sandwich chain Subway to design a new fibre-based, 100% kerbside recyclable catering platter to replace plastic takeaway trays;
• release a broad range of compostable, no-added PFAS sugarcane plates, bowls and containers called Vanguard;
• collaborate with food delivery platform Uber Eats to produce smaller-sized paper delivery bags for single orders to reduce waste.

Label preference study — plant-based, vegan or vegetarian?

La Trobe University research published in Appetite shows a preference for the term ‘plant-based’ over ‘vegetarian’ and ‘vegan’ on food labels.

The research, conducted among US and German consumers, examined the impact of plant-based, vegan and vegetarian labels on participant appraisals of how healthy, tasty, environmentally friendly, ethical and pure a range of foods were perceived as being.

The study included foods that are traditionally fully animal-derived, such as cheese or sausages, and foods that may contain small amounts or no animal-sourced ingredients, such as pasta, chocolate and cookies.

Lead researcher Dr Matthew Ruby said that both US and German participants showed a preference for foods labelled plant-based, rating them as tastier and purer, and indicating they were more likely to buy them over the same foods labelled vegan or vegetarian.

“While our US participants also believed the plant-based foods were healthier, more ethical and more environmentally friendly than the other labels, our German participants did not make the same connection,” Ruby said.

“This is perhaps because vegetarian and vegan labelling is more widespread in Germany, on both healthier whole food products and heavily processed foods.”

Anticipated taste was the main predictor of how likely participants would be to purchase the food products, but perceptions of how ethical and pure the foods were were also mattered to consumers. This was the case both for those who carefully read food labels when shopping and those who did not.

The study was conducted following calls for research on how to promote plant-based food products to appeal to larger numbers of consumers, and may be used to help plant-based food manufacturers improve their product marketing.
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German company Koehler Paper and chocolate manufacturer nucao are collaborating to produce what the companies describe as Germany’s first chocolate bars with 100% paper packaging.

The nucao bars Crisp & Crunch, Almond Butter & Sea Salt, Roasted Hazelnut Butter, Creamy Strawberry and Salted Caramel are the first chocolate bars in paper packaging to be available on the German market.

The flexible packaging paper called Koehler NexPlus Advanced has oxygen, mineral oil and grease barrier properties, which makes them suitable for packaging of chocolate-coated fruit products. The 100% recyclable paper is now suitable for use on not just vertical packaging machines but also horizontal packaging machines.

Over the past few months, the Koehler Paper team worked together with researchers and developers from Koehler Innovation & Technology to develop the flexible packaging paper for use on horizontal packaging machines. “From a technical point of view, this is revolutionary as vertical packaging machines have a very high production speed. Paper needs excellent strength properties to be processed in this way, without being too thick for the machines to handle it,” explained Alexander Rauer, Head of Business Development for flexible packaging paper at Koehler Paper. “Koehler NexPlus Advanced now offers all the necessary properties for this, allowing production speeds of 600 bars/min to be achieved with this packaging paper. The fact that the brand owner, packaging paper manufacturer, printer and packaging machine manufacturer were involved in the development from the outset enabled the time to market launch to be drastically shortened.”

The 100% recyclable generation of Nexflex flexible paper packaging is designed to replace plastic in packaging by using so-called barrier paper wherever possible. The range covers a broad spectrum: it includes standard coated and uncoated paper used in laminates for pouches, sachets and other applications, making it suitable for a wide range of packaging for food and non-food products.

**Label applicator**

The AP380 is the latest product from Primera, capable of applying labels to bottles, jars and other cylindrical containers 30% faster than previous models.

Featuring intuitive controls and an easy set-up, it allows for quick adjustments and seamless integration into existing production lines. Operators can save up to nine settings for optimal label spacing, streamlining the labelling process and enhancing consistency. Other features include a built-in rewinder, LED counter and five roller locations.

The label applicator is built to be able to handle a wide array of cylindrical containers of all shapes and sizes, including bottles, jars, cans and tubes. It can accommodate containers with widths from 25 to 239 mm and diameters from 15 to 170 mm, providing good versatility. It is even suitable for those containers with slight irregularities or tapering.

With a labelling capacity of up to 1500 containers/h, users can achieve a 30% increase in production speed compared to previous models. It can also apply labels to both the front and back of the container at the same time.

The AP380 uses precision sensor technology that automatically adjusts based on a label’s thickness and the built-in spring-loaded pressure arm applies labels firmly and without wrinkles, so it’s designed to provide consistent results.

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In the UK, packaging specialist Parkside has partnered with tea brand Hoogly to develop a range of compostable teabags for the hotel and hospitality sector.

The solution uses a laminate that combines Parkside’s compostable Park2Nature material with a high-performance metallised compostable film, NatureFlex NM, sourced from film specialist Futamura. The finished envelopes, which are TÜV certified as home compostable, provide good barrier performance that keeps the tea fresh, while also locking in the vibrant aromas of each blend.

TÜV certification means the pack has undergone extensive testing and will break down in domestic compost heaps within 26 weeks, and within 12 weeks in an industrial composting facility.

Staci Bye, Sales Account Manager at Parkside, said: “Meeting the unique needs of each of our customers is our number one priority when taking on a packaging project. We’re delighted that we were able to do that with this design, which meets the customer’s desire for a sustainably developed pack that still offers the barrier performance required to keep the teabags fresh. “And, as someone who travels a lot when engaging with our customers face to face, I’m looking forward to enjoying a cup of Hoogly tea during my next hotel stay!”

The packs are initially available in three flavours, English breakfast, mint and green tea. The teabags can be found in hotel rooms located at more than 50 sites across the UK.

To learn more about Parkside and its range of sustainably developed flexible packaging solutions, visit www.parksideflex.com.

**White floatable PO sleeve film**

Innovia Films has announced the extension of its product range for floatable polyolefin shrink films. The new film is a low-density white film made from polyolefin that maintains floatability when printed. The opaque film contributes to the light-blocking properties of the shrink sleeves that later can be applied to containers for industries that are light sensitive such as dairy, food supplements, nutritional products and cosmetics.

As with the clear film range, RayoFloat white APO (WAPO) facilitates easy separation and removal of labels from PET bottles and other types of plastic containers in the recycling process. It automatically detaches during sorting and recycling in the sink/float process and thus enables a high yield of high-quality PET flakes that are the basis of food grade recycling.

The film also supports a closed loop in the production facility and contains up to 20% post-industrial recycled content.

The film will be produced at the European Innovia site in Poland.

*Innovia Films Pty Ltd*

www.innoviafilms.com

**100% rPET tray**

Klöckner Pentaplast (kp) has launched food packaging trays comprising 100% recycled PET (rPET) deriving exclusively from trays.

Until now, food packaging trays have been manufactured using ever increasing proportions of recovered PET material; however, the newly launched kp tray is composed entirely of recycled tray material.

The kp supply chain is RecyClass certified.

The Tray2Tray content is designed to be a ‘drop in’ solution, so switching over is easy, and the company said the packaging performance isn’t compromised.

*Klockner Pentaplast (Australia) Pty Ltd*

www.kpfilms.com
Boutique European High Performance Thermoforming Machines

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**Self-adhesive materials for biodegradable labels**

Banana skins and labels can now both be disposed of as compost as the HERMA adhesive 62Q is certified in accordance with the strict Australian standard.

Two HERMA self-adhesive label materials that can be composted at home and in the garden have now also passed the critical earthworm toxicity test in accordance with the Australian standard AS 5810.

The certification was obtained through the DIN CERTCO institute, a subsidiary of TÜV Rheinland. The basis for this is the new adhesive 62Q, which HERMA launched at the start of 2023.

The certification applies in conjunction with the two label materials HERMAextracoat (grade 242) and HERMAtherm Bio (grade 909).

The complete biodegradability, compostability and ecotoxicity were also checked. The two HERMA self-adhesive materials already met these requirements previously and were therefore already able to bear the label “DIN geprüft – gartenkompostierbar” (“DIN tested – compostable in the garden”) — at least outside of Australia and New Zealand. Now the certification also applies to Australia and New Zealand.

**HERMA**

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

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**Palletising solution**

Sidel’s RoboAccess_Pal S is a palletising solution combining robotic and cobotic systems for the food processing market.

The flexible solution can deliver speeds of up to 12 cycles per minute and enables a case payload of up to 25 kg. It has a compact design that enables two stations to be set up with a footprint of less than 12 m².

**Sidel Oceania Pty Ltd**

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

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**Package code management software**

Matthews Australasia has unveiled the latest version of its Australian-developed and supported package code management (PCM) software, iDSnet, at APPEX 2024.

iDSnet PCM software is designed to provide users with packaging quality assurance. The no-code/low-code platform version is designed to be ‘deployed for a purpose’, which means it has the ability to deploy the software to meet specific logic requirements without a software engineer to undertake custom scripting or software development to meet unique user requirements.

The browser-based, agnostic operating system has the capability for real-time changes live on the screen. It is fast and simple to update or add on to without costly interruptions to production lines.

Other features include: open architecture; simpler, faster, lower-cost deployment to futureproof a manufacturing business; and advanced device drivers with inbuilt format-management tool to centralise a user’s coding and labelling standards across multiple production lines and sites.

According to the company, the platform requires no-code deployment to connect devices on the factory floor, with the goals of firstly eliminating coding errors, and then to turn the connected devices — such as inkjet printers, checkweighers and scanners — into IOT devices. These devices can then contribute data back to either the Matthews system or a third party.

This version also has in-built error testing and diagnostics to improve identifying root cause of issues.

There are now three versions of iDSnet available.

iDSnet Cloud is an entry point for package code management software. This cloud-based tool generates and prints carton, crate GTIN and SSCC industry-compliant labels.

iDSnet Express is a ‘step up’, designed for small to medium-sized manufacturing businesses to eliminate costly packaging errors on their production lines.

iDSnet Enterprise allows manufacturers to upsize production-line efficiency and eliminate manual waste with this low-code/no-code paperless platform, including full ERP integration.

**Matthews Australasia Pty Ltd**

Just in Time Packing Solution

Box Making Machine

Any Type of Box.
Any Quantity.
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We offer a diverse selection of pre-owned equipment that is available for purchase. We also buy used equipment.
Recyclable lidding film for fresh produce

Parkside has launched its latest flexible packaging innovation, Popflex lidding film, providing a recyclable solution for fresh produce packers and growers.

When paired with and weld-sealed to a matching PET tray, the film is designed to stay attached to the tray throughout the recycling process, reducing the risk of PET material contaminating PP and PE recycling streams. This means the solution is OPRL-certified as recyclable in kerbside collection schemes, meaning the end user can simply drop the entire pack into their recycling bin after use.

The film is laser-scored using patented ParkScribe technology to create an integral opening flap that end users can press down, pop open and peel back, creating a simple opening experience for consumers. The film is breathable when using the option of macro perforation to prolong the shelf life of the produce, and is made using recyclable PET containing a minimum of 30% post-consumer recycled content film. It is a mono PET rather than duplex like Parkside’s laser-scored lidding, which means it uses less plastic but has the same recyclable classification.

Parkside
www.parksideflex.com

Sustainable lidding solutions

The Chadwicks polypropylene (PP) die-cut lidding is a mono-material solution that is 100% recyclable. The PP lidding is designed to provide good puncture and tear resistance and is suitable for various products, including dairy, snacks, dips and convenience.

The sealing temperature of the lid is claimed to be 100°C lower than conventional aluminium and PET lidding so can provide energy savings.

The company also has a resealable lid designed to remove the necessity for a plastic over-cap while keeping products fresh.

Chadwicks
chadwicks lids.com
listeria insights at food processing facility

Despite extensive sanitation procedures, microbes such as listeria can occasionally breach food safety barriers at food processing facilities. Researchers study the reasons why, beginning with analysis at the factory floor of a ready-to-eat food processing facility.

Researchers wanted to understand the potential sources of cross-contamination and the factors that contribute to the survival of *L. monocytogenes* in these environments, particularly the communities of other microbes that support and protect it.

They began by sampling the floor of a ready-to-eat food factory that had recurrently detected *L. monocytogenes* in specific non-food contact areas of the factory. They sampled different sites: a preparation area, where ingredients were kept at 4°C, and a production area, where they assembled and packaged the food, kept at 10°C. They aimed to measure the changes of bacterial communities over time, so they sampled the sites over 10 weeks, before and after cleaning. They then cultured and performed genetic analysis on the samples to identify which bacteria were present and in what proportions.

The results showed that the populations of bacteria that coexist with *L. monocytogenes* were stable over time and have adapted to the conditions on the factory floor, including food safety controls. Maria Diaz from the Quadram Institute and lead of the study explained, “As *L. monocytogenes* is supported by a stable community of other bacteria, we may now need to develop new strategies to alter the whole bacterial population to effectively eliminate the pathogen.”

While the overall bacterial populations and proportions of bacteria were stable before and after cleaning, Diaz explained that we cannot assume cleaning efforts do not work. “The populations are very stable, and cleaning is not shifting the composition — it’s not letting one bacterium grow over another. After cleaning, the bacteria reduce in numbers and the bacterial load is lower, making cross-contamination less likely.”

There was a marked difference, however, between the different areas of the factory at different temperatures, suggesting that the bacterial populations are highly adapted to the different environments within the factory. It also suggests that the bacteria present in the factory are established populations rather than bacteria introduced from outside sources — as despite movement of personnel between them, the populations remained stable.

While the factory had listeria under control at the time of sampling, this new research is important for understanding the different communities of microbes in different environments across ready-to-eat food facilities. Researchers hope that understanding how listeria survives in these environments could inform more accurate laboratory testing of cleaning methods. “Thanks to this research, we can better understand the lifestyle of this pathogen and start to develop laboratory models that allow us to investigate new ways of killing listeria,” Diaz said.

Diaz presented the data at the Microbiology Society Annual Conference in Edinburgh in April.
Hygienic flow meter + IO-Link
In today's fast-paced industrial sector, digital connectivity and hygiene play pivotal roles in ensuring product quality and meeting regulatory standards. The advent of digitalisation has brought about transformative changes in various industries, particularly in the realm of flow measurement.

Digitalisation has changed food manufacturing by offering real-time data accuracy and quality assurance. Plug-and-play installations simplify the set-up process, enabling operations to quickly leverage the advantages of digital connectivity.

The ifm Hygienic Flow Meter with IO-Link is an example of technology in the food industry that can provide benefits in terms of quality control and efficiency.

The solution is designed to provide transferrable, readable and actionable insights using real-time data. Providing traceability for quality assurance, it can empower users to make informed decisions and optimise processes.

IO-Link, a standardised serial communication protocol in industrial automation, interfaces sensors or actuators with higher-level control systems. This integration provides increased flexibility, easier configuration, enhanced diagnostics and seamless integration, making it suitable for industrial automation applications.

Built to withstand the rigours of the food industry whilst providing invaluable insights, the hygienic flow meter has undergone rigorous testing. From temperature shock tests to pressure peak simulations, the device is built to withstand the most demanding conditions to provide long-lasting performance. It also has a protection rating of IP67 and IP69K.

Drum washer
The Marel RevoPortioner Drum Washer concept provides solid cleaning results while reducing water and energy consumption. Up to 69% less water and up to 53% less energy can be achieved, with the same clean result every time.

The drum washer has the latest software implemented to achieve these savings. The new software version is designed to ensure a high-tech management of the completely automated washing program. The secret lies in the smarter use of water in the washing unit, while achieving the same cleaning results.

As before, the drum, which can weigh from 200 up to 500 kg, is hoisted out of the RevoPortioner using a special cart and placed into the drum washing unit. The addition of the dosage of disinfectant, detergent and water is fully automated. Spanning the entire width of the drum, the cleaning program effectively covers all corners and edges of the moulds, to ensure release of the formed products in the next processing round.

The washer is equipped with a user-friendly HMI screen, enabling easy set-up of the washing program. This is where energy and water consumption are controlled. With the new software, processors can access detailed information on the system's touchscreen, including the real-time progress of the washing process.

Marel
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Faulty or poorly maintained compressed air systems run very inefficiently meaning much higher energy costs for far less productivity. Breakdowns cause expensive downtime... YET, IT IS ALL AVOIDABLE!
Leafy green vegetables have been known to harbour harmful pathogens, with some recent outbreaks of foodborne illness reported across the US leading to the development of leafy green safety protocols. Now a study from the University of Illinois Urbana-Champaign examines factors that affect E. coli contamination on five different leafy greens — romaine lettuce, green-leaf lettuce, spinach, kale and collards.

“We are seeing a lot of outbreaks on lettuce, but not so much on kale and other brassica vegetables. We wanted to learn more about the susceptibility of different leafy greens,” said lead author Mengyi Dong, now a postdoctoral research associate at Duke University.

The researchers infected whole leaves from each of the five vegetables with E. coli O157:H7 and observed what happened after storage at 4, 20 and 37°C. Overall, they found that susceptibility was determined by a combination of temperature and leaf surface properties such as roughness and the natural wax coating.

“At room temperature or higher, E. coli grows very fast on lettuce, but if lettuce is refrigerated at 4°C, we see a sharp decline in the E. coli population. However, for waxy greens like kale and collard, we get the opposite results. On these vegetables, E. coli grows slower under warmer temperatures, but if it is already present, it can survive longer under refrigeration.”

Even so, kale and collard are overall less susceptible to E. coli contamination than lettuce. Furthermore, these vegetables are usually cooked — which kills or inactivates E. coli — while lettuce is consumed raw. Rinsing lettuce does help, Dong said, but doesn’t remove all the bacteria because of their tight attachment to the leaf.

The researchers also inoculated cut leaves with E. coli O157:H7 to compare the intact surface of a whole leaf to the damaged surface of a cut leaf.

“Whole leaves and freshly cut leaves present different situations. When the leaf is cut, it releases vegetable juice, which contains nutrients that stimulate bacterial growth,” Dong said. However, the researchers found that spinach, kale and collard juice actually exhibited antimicrobial properties that protect against E. coli.

To further explore these findings, they isolated juice (lysate) from kale and collards and applied the liquid to lettuce leaves, finding that it can be used as a natural antimicrobial agent. The potential applications could include antimicrobial spray or coating to control foodborne pathogen contaminations at both pre-harvest and post-harvest stages, the researchers said.

“We can’t completely avoid pathogens in food. Vegetables are grown in soil, not in a sterile environment, and they will be exposed to bacteria,” said co-author Pratik Banerjee, Associate Professor in FSHN and Illinois Extension specialist.

The paper, Fates of attached E. coli O157:H7 on intact leaf surfaces revealed leafy green susceptibility, is published in Food Microbiology.

Our highly trained and experienced mobile technicians provide professional servicing and repairs to most makes and models of compressors and systems. They carry a wide stock of spare parts and offer a 24/7 emergency breakdown service.
Westfalia Fruit, a multinational supplier of avocados, has conducted the first successful trials of a natural mist technology that is designed to improve food safety within the supply chain.

Current industry practice is to manually deep clean avocado ripening rooms to maintain high levels of food safety and eliminate residue from naturally occurring fruit mould. Westfalia’s new method uses a probiotic uniquely distributed within a water mist circulated throughout ripening room, which is designed to deliver several benefits.

According to Andrew Mitchell, Head of Innovation at Westfalia Fruit, the probiotic liquid used is similar to that found in yoghurts. “This type of probiotic is also very good at attacking yeasts and moulds. We have developed the application of this natural probiotic further as a liquid; Westfalia Fruit is the only avocado supplier able to do this,” he said.

In an initial study there was a 65% reduction in micro levels in the trial room compared to the control room. The study also found that mould on the individual fruit was significantly reduced. Avocados that had been treated with the probiotic remained mould-free for up to 15 days, which resulted in a reduction of internal rot of around 20%. Using this method also has other benefits — it can eliminate the need for chemical cleaning materials, avoids the need to shut down ripening rooms for cleaning and can also be applied to hard-to-reach areas such as ventilation ducts and fans.

Westfalia is conducting a second trial, applying the probiotic liquid from the roof of the ripening room, and expects this to achieve a 90% reduction in micro levels compared to the control room. Fruit quality will be continuously monitored over a four-week trial in preparation for initial rollout across Westfalia’s UK facilities.

“From there, we will be managing a rollout to our European operations and extend trials across a range of products including citrus and mango. Looking even further ahead with the benefit of Westfalia’s integrated supply chain, the unique misting technique can be applied within shipping containers, giving fruit the benefit of the probiotic application before reaching its final destination,” Mitchell said.

“We are very excited about this breakthrough. As well as the immediate benefits we anticipate a further reduction in potential waste product whilst successfully and naturally maintaining food safety, all of which directly aligns with our ambitious sustainability goals.”
Food, beverage and pharmaceutical manufacturers are under increasing consumer and legislative pressure to ensure product safety and quality. As a result, many rely on checkweighers, metal detectors, and vision and X-ray inspection systems to provide assurance that the products coming off their production lines meet consumer expectations and are as safe as possible.

Investing in hygienically designed product inspection equipment is crucial in avoiding cross-contamination and preventing the growth of microbiological contamination within manufacturing plants. Most responsible companies already use hygienically qualified equipment. Those that do not follow good hygienic practices may have a lower initial cost, but their total cost and risk to the consumer is much higher.

**So why is hygienic equipment so important?**

Every year as many as 600 million people, or almost 1 in 10 people in the world, fall ill after consuming contaminated food, according to the World Health Organization’s (WHO) first ever global estimates of the global burden of foodborne diseases in 2015.

Microbiological bacteria cause approximately 90% of all foodborne illnesses. Bacteria that cause human illnesses, including disease, are called pathogenic, and those most likely to be found in food include *Salmonella*, *Listeria*, *E. coli* and *Campylobacter*.

Listeria is the most commonly found bacteria in the food industry and is the food pathogen that has had the most impact on improvements in facility hygienic design over the past 30 years. When sanitisation practices are insufficient, listeria can harbour and thrive in many pieces of equipment used in food processing plants, such as conveyor belts, slicers, dicers and peelers.

Machinery used for packaging products can also harbour and transfer bacteria to products. When this occurs, scrupulous sanitisation must occur to eliminate listeria. The primary response to contamination outbreaks has been increased implementation of the Hazard Analysis and Critical Control Points (HACCP) system and other food safety programs, as well as an increased reliance on third-party auditing programs. Foodborne illness outbreaks also triggered recent food safety legislative activity, including the U.S. Food and Drug Administration (FDA) Food Safety Modernization Act (FSMA).

Hygienically designed product inspection equipment offers food and beverage manufacturers numerous benefits. In addition to helping to protect consumer welfare and companies’ brand reputations by increasing product safety and reducing the risk of recalls, hygienically designed equipment can help manufacturers with HACCP, legal and regulatory compliance, as well as result in cost savings and increased operational efficiency in the long run.

As food and beverage recalls become more frequent and costly, and safety laws become increasingly stringent, it is important that all product inspection equipment not only performs well, but is designed to prevent bacterial growth and facilitate proper cleaning. Hygienically designed equipment can play a key role in reducing the risk of microbiological contamination outbreaks and can also aid regulatory and HACCP compliance.

METTLER TOLEDO manufactures its equipment to be in-built with hygienic principles in mind to offer manufacturers several additional long-term benefits, including reduced overall operating and maintenance costs and increased operational efficiency.

To find out more go to mt.com to download the ‘How Hygienically-designed Equipment can Reduce Operational Costs’ white paper from the expertise library section of the website.

Specialised compressed air for the food industry

Compressed air is a key utility supporting the food packaging and food processing industries in Australia. Where compressed air comes in direct contact with food products it must be contaminant-free to ensure the quality of the end product.

There is a vast array of applications for compressed air in the food industry. Many operations, such as bakeries, use compressed air in various applications such as cleaning and packaging. Others use compressed air to clean containers before filling the containers with food. Compressed air is also used to sort, cut and shape food products.

Other applications include machines forming, filling and sealing cartons in the dairy and juice industries. These machines must be washed down constantly to maintain sanitary conditions. They are not just subjected to water but are also exposed to chemical cleaners. Pneumatic systems are preferred over hydraulic systems in these machines because in a wet environment, having leaked oil on a polished tile floor becomes a real safety hazard. Low maintenance and downtime associated with pneumatics is also a key reason why compressed air is preferred. This is an example of where compressed air does not come into contact with food — but there is a high risk that it may occur.

Compressed air is used in a range of pressures from high-pressures up to 35 bar for blow moulding and for lower pressures of 11 bar for blow-off applications. Compressed air must be contaminant-free. Compressed air must be purified of contaminants before use in the food industry.

The contaminants are water vapour and moisture, solid particulates (including spores) and oil aerosols and vapours. The presence of moisture is a primary concern for the food industry as moisture creates the ideal habitat for microorganisms and fungus. Moisture may reside in the piping system near point-of-use applications where compressed air comes into contact with food products. Microorganisms and fungus can grow inside the piping system and then be blown into food products or food containers.

In order to inhibit the growth of microorganisms and fungi, pressure dew-points must be below -26°C. Drying the compressed air to a specified pressure dewpoint is the simple way to eliminate moisture in the compressed air system.

Solid particulates must be removed with filtration products from the compressed air system. When compressed air is dried below -26°C, harmful microorganisms and fungi are converted into spores. These spores are now a “solid particulate” which must be filtered. Other sources of solid particulates are coatings on the air compressor rotors, pipe-scale from the compressed air piping system, and ambient dust and...
particulates which may be ingested by the air compressor. It is recommended, when selecting compressed air filtration products, that care is taken to request coalescing filters tested to the new ISO Standard 12500 Parts 1-3.

Oil aerosols and vapours are another significant concern. One myth in compressed air systems is that the use of an oil-free air compressor frees the system of any compressed air treatment requirements. This is not the case. Ambient air ingested by air compressors will carry water vapour, particulates and hydrocarbons and compressed air dryers and filters are always therefore required.

In applications where compressed air comes in direct contact with food products a -40°C pressure dewpoint is recommended to ensure that no microorganisms can grow. This can be accomplished with desiccant (adsorption) type compressed air dryers located in the compressor room (centralised air treatment). Each facility will have to determine if further de-centralised filtration is required to ensure the dewpoint specification. Point-of-use air dryers may be of either desiccant (adsorption) or membrane-type technology.

Coalescing filters are required to remove solid particulates and total oil (aerosol + vapour) to the specification levels. Activated carbon filters will be required as well to remove oil vapours. As with the air dryers, each facility will have to determine if de-centralised filtration is required in addition to the centralised filtration.

Compressed air must be purified of contaminants before use in the food industry. The contaminants are water vapour and moisture, solid particulates (including spores) and oil aerosols and vapours.

Where compressed air is exhausted into the local atmosphere of the food preparation, production, processing, packaging or storage we have a high to low risk. A non-contact high-risk may be where compressed air is used in a blow-moulding process to create a package — and then product is introduced into the package later in process. Many food processors have their own in-house production lines to create their own packaging. Without proper air treatment, it is possible that oil, moisture and particulates (notably bacteria) could be present on the packaging — waiting to contaminate the food product!

A non-contact low-risk system is where the application means compressed air has absolutely no contact with food products or food-packaging machinery. It is important to understand this relationship and design your system accordingly. In this case a dewpoint of +37°F (+3°C) is recommended. This can be accomplished with refrigerated type compressed air dryers located in the compressor room (centralised air treatment). Each facility will have to determine if further point-of-use air dryers (de-centralised) are required to ensure the dewpoint specification.

Again, coalescing filters are required to remove solid particulates and total oil (aerosol + vapour) and activated carbon filters will be required as well to remove oil vapours. As with the air dryers, each facility will have to determine if de-centralised filtration is required in addition to the centralised filtration.

Regular maintenance of compressed air systems within the food industry is vital to ensure contamination free operation of the entire system from compressor to delivery.

Kaishan Compressors Australia can advise food industry professionals on the design and installation of application specific compressed air systems to ensure contamination free results. With a wide range of compressor types and models plus a nation wide fleet of highly trained mobile technicians, Kaishan provides the products and services to support the needs of the Australian food industry.

Kaishan Australia Pty Ltd
www.kaishan.com.au

www.foodprocessing.com.au May/June 2024
Calise and Sons Bakery has been delivering high-quality baked goods to the northeast of the USA for over 100 years, with a commitment to safe practices and continually improving their standards and processes. Maintaining this commitment was becoming a time-consuming and laborious endeavour for the Calise sanitation team.

**The challenge:**

The company’s facility in Rhode Island has multiple conveyor belts for baking, cooling and glazing. Its streamlined conveyor belt system weaves throughout the facility including sections suspended from the ceiling to deliver goods into their multiple, nearly 6 m high, spiral coolers.

Its weekly cleaning of the belts required multiple employees from members of the sanitation team to mechanics as they needed to remove the various sections of its conveyor belts, clean them and then reinstall.

To clean the entirety of its conveyor belt system, divided into 18 sections, was taking around 2 hours per section for two to four employees per section — ie, 120 labour hours to clean its conveyor belts.

**The solution:**

Working with one of the experts from the Goodway team, the company found a suitable solution during an on-site demo. The decision was made to get a GVC-18000 dry steam cleaner and the PureBelt Modular belt cleaning system.

Using an automated clean-in-place solution that harnessed the cleaning power of dry steam would deliver the sanitation results needed, reduce wastewater and eliminate much of the labour hours previously required.

**The result:**

Previously, it used to take 120 hours of labour time to properly clean its entire conveyor belt system but now it takes around only 6 hours in labour time and around 20 hours of total clean time — equivalent to a 95% labour/time savings for cleaning its belts.

As a bonus the GVC-18000 dry-steam cleaner was implemented to clean its slicer and other hard-to-reach areas. What once took anywhere from one to three hours is now completed in just 30 minutes.

*Goodway Technologies*

www.goodway.com
Hygienic materials for food processing equipment

Trelleborg Sealing Solutions’ range of globally compliant FoodPro materials is specifically designed for the stringent requirements of food processing equipment manufacturers. The range includes standard elastomers such as ethylene propylene diene monomer (EPDM), nitrile butadiene rubber (NBR) and fluoroelastomers (FKM), and corresponding plastics like Turcon polytetrafluoroethylene (PTFE), and Zurcon polyethylene and polyether ether ketone (PEEK).

The range is continually developed to meet the critical food contact sealing challenges faced by manufacturers. The new generation of FoodPro EPDMs is designed to meet all of the critical global regulations for food-contact materials and is suitable for use with almost all foods and beverages.

FoodPro materials are designed to provide the highest standards of cleanliness, with surfaces designed to avoid scratches or cracks where germs could accumulate. They are designed to remain robust against the regular harsh cleaning and sterilisation regimes required for food-contact materials.

FoodPro E75F2 is the all-rounder in the portfolio, designed for both static and dynamic applications. It is designed to be universally used in a variety of processing environments and applications including separators, decanters, valves, pipe couplings and filling systems. For applications with particularly high pressure, FoodPro E85F2 is suitable. With similar properties to E75F2, its greater hardness provides improved extrusion resistance.

Trelleborg’s in-house testing facilities provide validation of applications, including compatibility with a wide range of commercial and commonly used cleaning agents and sterilisation processes, typically involving overheated steam up to 150°C.

Trelleborg Sealing Solutions
www.trelleborg.com
Case Study

Chicken processor uses dewatering system for drier waste and sustainable gains

A major Australian supplier of poultry and protein products has adopted the KDS liquid-separator technology to enhance efficiency while reinforcing its environmental credentials with its food and retail industry customers.

The clog-free automatic KDS liquid-to-solid waste separator from CST Wastewater Solutions is being used throughout Australia and New Zealand for compact dewatering applications ranging from food processing, food waste, grease trap and waste oil through to municipal wastewater sludge, livestock manure and agribusiness processes.

The energy-saving and water-saving technology — which also typically halves the cost of transporting its drier and lighter output, for recycling or disposal — is being used by this chicken processor (which cannot be named due to commercial confidentiality reasons) to process three cubic metres of wastewater every hour.

Designed for efficiency, sustainability and conservation of resources in small- to medium-sized applications, the energy-efficient KDS separator consumes as little as 0.06 kW/h of electricity and uses no washwater. The simple-to-maintain separator has a high throughput within a small body, with the smallest model being just under 350 mm wide and weighing 50 kg. The compact rotational oval plate structure achieves high transportation and separation efficiencies, while the simplicity of the machine’s overall structure provides for low maintenance, which is claimed to achieve cost and WHS benefits through less handling being required to clear otherwise potentially hazardous materials, including, in this case, mixed poultry waste and process effluent.

“The KDS installation dramatically reduces waste disposal and landfill costs while reducing this customer’s environmental footprint, so it’s a win-win,” said Michael Bambridge, Managing Director, CST Wastewater Solutions.

The KDS separator — which is also available skid-mounted for operational versatility and relocation — is designed to use a fraction of the power of a centrifuge and requires no water usage during operation, unlike alternatives such as a belt press or screw press.

Used for thickening of dissolved air flotation sludge — a common application throughout wastewater operations — it achieves solids capture of 97% with thickened sludge at a dryness of 17%. Waste activated sludge dryness levels are typically 15–25%. Thickened sludge dryness at this chicken processing facility has achieved this same range even with the elevated levels of fat and oil involved in the application.

The KDS reduces the amount of sludge to be removed by at least 50% — and opens up potential for re-use in composting and energy recovery, rather than straight disposal. “Plus, there is no operator required, and the whole installation is enclosed, so odours don’t escape,” Bambridge said.

Bambridge added that, because it produces drier and lighter waste, the KDS avoids the problem faced by many food and primary production plants of tons of sodden, sticky, unhealthy and potentially environmentally hazardous wastewater sludge by-product that must be expensively transported to costly processing and disposal facilities.

The wet cakes of by-product from farms, food processors, kitchens, manufacturers and primary producers can cost upwards of AU$150 (NZ$160+) a ton to move by specialised transport from the places where effluent is produced to centres where compacting, drying, recycling or disposal can take place in controlled environments where they don’t threaten groundwater.

The compact KDS multi-disc roller separator also saves money and downtime by featuring a self-cleaning dewatering and conveying system with oval plate separation and transfer structure that prevents clogging and permits automatic continuous operation that handles oily and fibrous material with ease.

Applications for which the separator is designed include: food processing waste, including snackfoods, kitchen and restaurant waste, raw wastewater (primary screening) and sludge; sewage treatment, including raw wastewater (primary screening) and sludge to landfill; abattoir, feedlots, and dairy farm wastewater and sludge with cattle manure cake dryness of 25–35% typically achieved; pig farm raw manure and sludge, with cake dryness of 20–30%; barrel polishing water, water-based paint wastewater, grease trap waste, dyeing wastewater, waste oil and plastic recycling; and seafood processing.

CST Wastewater Solutions

www.cstwastewater.com
A complete IO-Link Safety System

Pilz now offers a complete IO-Link Safety System for safe communication at field level. The system solution from Pilz comprises Master, as well as field devices and compatible accessories. The complete package from the expert in safe automation makes it easier to integrate IO-Link Safety technology into plant and machinery.

Among the first devices in the Pilz portfolio to be equipped with IO-Link Safety functionality are:

- Safety light curtains PSENopt II advanced IOLS
- Control unit PITgatebox IOLS
- IO-Link Safety Master PDP67 IOLS

**IO-Link Safety Master**
As the interface to the safety controller, it enables bidirectional communication up to field level. IO-Link sensors and actuators can be connected in addition to the IO-Link Safety devices, as can classic safety sensors.

**Safety controller**
The safety controller monitors the inputs and controls the outputs. For decentralised control architectures, communication between the controller and decentralised periphery is via PROFINET / PROFIsafe, for example.

**IO-Link Safety Devices**
IO-Link Safety devices include safety sensors and safety actuators. They communicate directly with the IO-Link Safety Master and provide important status information. Improved diagnostic options are the result, including in the field of functional safety. The IO-Link Safety devices can be identified and parameterised independently, thus ensuring simple exchange and reduced downtimes.

**IO-Link Devices**
IO-Link devices include sensors and actuators with IO-Link functionality. For example, signal lights, level sensors or temperature measurement sensors. The generated data is forwarded directly to the higher level Master, where it can be further evaluated.

**Safety Sensors**
Safety sensors are used in almost every sector and application, enabling plant and machinery to be operated safely and efficiently. These standard safety sensors can also be connected to the IO-Link Safety Master.

Find out more about our IO-Link Safety System

Pilz Australia
Head Office
Unit 1, 12-14 Miles Street Mulgrave, VIC 3170 Australia

Phone: 1300 723 334 50
Email: sales@pilz.com.au
Website: www.pilz.com.au
Pilgrim’s UK wanted to reduce sludge transport costs at its pork processing plant so it employed WCS Environmental Engineering (WCSEE) to help with that task. It has now trialled a new system that has resulted in not only lower carbon emissions but also green energy generation.

The challenge
Pilgrim’s UK already treats its own wastewater, which is processed through a dissolved air floatation (DAF) treatment system to meet high environmental trade effluent consents. A by-product of the DAF process is liquid sludge, which was historically collected from the plant and transported offsite up to six times a week for further processing by the site’s waste management company. This was costing the site not only time and money but also carried a high carbon footprint.

Andrew Hill, Site Services Manager at Pilgrim’s UK, said, “Pilgrim’s UK has ambitions to reduce its carbon footprint as part of its pledge to become net zero and reduce onsite waste through design and implementation of circular economy processes. The engineering team wanted to investigate the possibility of dewatering onsite, to reduce the cost of transportation and carbon emissions, and to see whether the dewatered sludge could be useful or had value.”

The solution
WCSEE carried out a laboratory test and analysis to find out more about the composition of the sludge and understand treatment options.

The technical team at WCSEE then designed and developed optimal chemical and mechanical treatment options to economically process the sludge at the plant located in Spalding, UK. This involved a trial installation of the screw press for five days to demonstrate its dewatering and sludge thickening capability.

The screw press model supplied was specified to meet the volumes of sludge the site was producing along with the correct blend of chemicals and precise dosing measurements. The plant was also assessed to identify the best location and configuration for the Volute Screw Press, including access to power and water.

A 6 m containerised unit, constructed offsite, was placed inside the existing processing plant containing everything needed to start processing the sludge.

“With the screw press’s plug-and-play capabilities, the team quickly adapted to the technology, and after a five-day trial period, it was decided to extend the trial by directly renting the unit from WCSEE, to further understand the return on investment,” Hill said.

The results
The trial showed that the dewatered sludge produced at the Spalding site had a potential gas yield that could be used to generate biogas electricity. Pilgrim’s UK was able to send the dewatered sludge to the nearest anaerobic digestion (AD) plant which proved to have such a high gas yield that it was valuable feedstock for biogas electricity generation.

Since the installation of the screw press, Pilgrim’s UK has seen more than an 80% reduction in sludge volumes overall and is now only sending dewatered sludge cake from the AD plant once a week on average. This process is now operating at zero cost due to its high biogas electricity generation value.

The Volute Screw Press is used for thickening and dewatering of DAF sludge with the addition of a self-cleaning filter that prevents clogging and enables constant dewatering without using large volumes of water. This delivers stable and constant dewatering, achieving up to 99% efficiency savings against belt presses and 92% against conventional screw presses.

Operated automatically by a 24-hour sensor control, if required, the Volute Screw Press is claimed to also require 70% of the footprint of standard screw presses and 5% of the power usage of a comparable centrifuge.

WCSEE now has an ongoing relationship with Pilgrim’s UK, which includes repair and maintenance along with chemical support with an optimised polymer used for the dewatering process.
Any Way You Cut It
Rely on Urschel

As a powerhouse developer and manufacturer of cutting machinery, Urschel delivers targeted results to meet processing goals and optimise profits. Rugged slicers, shredders, dicers, and milling machinery built to exceed expectations.
**Lithium-ion-powered pallet truck**

The Hyster PC1.5 Lithium-ion-powered pallet truck is suitable for food processing facilities.

The unit has a range of features tailored to enhance productivity in this demanding industry. With its compact and lightweight design, the pallet truck is suitable for manoeuvring in tight spaces in food processing plants.

With triple the efficiency of a manual hand pallet jack, the truck is designed to keep up with the fast-paced nature of food processing operations and the quick 6 s battery changeover time is designed for continuous operations and keeping a production line running smoothly.

The truck is built to withstand the rigorous demand of the food processing industry, through enhanced performance, reduced product wastage and maximised productivity.

*Adapt-A-Lift Group*


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**Protein processing line**

JBT presented a complete line of solutions for protein processors, including the introduction of new portioning, bone detecting and all-in-one cooking technologies, at Anuga FoodTec 2024. From injection and marination and portioning, through coating and cooking, to freezing and packaging, JBT demonstrated its ability to cater for an entire production line.

Two new JBT solutions included: the DSI 812 Compact Waterjet Portioning system and the Innospexion Bone Detection X-ray system.

The Innospexion’s technology allows processors to detect poultry bones down to 2 x 2 mm while reducing false positive reject rates to levels lower than current industry standards, which is designed to help drive labour reduction and higher yields.

The JBT DSI 812 Waterjet portioner is designed to allow users to get up to 25% more yield and maximise utilisation, throughput and flexibility. With its compact design, the portioner is suitable for small to medium-sized processors. An all-in-one waterjet portioning system with an integrated water pump, it is designed to deliver all of the benefits of DSI waterjet portioners at an accessible price and footprint.

The latest version of JBT alco’s HotCook AHC has also been released. It is a multifunctional system for searing, simmering and cooking, which combines several production steps in a single machine.

JBT Tipper Tie’s TT Stick is the latest product in its line of Automated Hanging Systems for portions or strings of sausages. Combining automated suspension technology with intuitive, user-friendly controls, the technology enables users to put more sausages on a stick, which means more product can be fitted into drying rooms and smoke houses. In addition to the TTStick, Tipper Tie also has the TT1512 Automatic Double Clipper and a meat sausage casing stuffer.

*JBT*

[www.jbtc.com](http://www.jbtc.com)
Gundagai Meat Processors (GMP) and Triton Commercial Systems have collaborated on an innovative project centred around the development and implementation of the FUSION Manufacturing Execution System (MES). The project not only earned the prestigious APPMA Award for Digital Innovation but has also set new standards in the competitive meat processing industry.

The cornerstone of the project was Triton’s approach to integrating disparate technologies into a seamless operational framework.

Recognising the need for a unified system that could leverage the latest in objective measurement technologies — specifically Lean Meat Yield (LMY) and Intramuscular Fat (IMF) — Triton developed the FUSION MES in addition to its existing slaughter line, livestock payment and chiller sortation production systems. The resulting solution combines RFID skid tracking, advanced carcass measurement tools and cloud-based data analytics into a cohesive platform that is designed to enable GMP to track, analyse and optimise meat processing with precision.

The integration process involved:

- Custom software development: Crafting algorithms that process LMY and IMF data to grade carcasses, offer premiums to farmers where the optimum grades are reached, then sort, process and package as the premium GLQ5 grade.
- Hardware integration: Connecting various measurement tools and automation technologies to the FUSION platform.
- Data management solutions: Implementing cloud-based systems for real-time data collection, analysis and reporting, which are designed to enhance decision-making and traceability across the supply chain.

For GMP, the implementation of FUSION MES created operational advancements such as:

- Efficiency and productivity: Automated processes and precise sorting mechanisms have reduced manual labour and processing times.
- Product quality: Objective measurements ensure that only the best quality meat reaches the market, enhancing GMP’s product offerings.
- Data-driven operations: Real-time access to detailed processing data enables GMP to make informed decisions, improving overall operational effectiveness.

Farmers, as crucial stakeholders in the supply chain, gain from the project with:

- Fair compensation: The precision of LMY and IMF measurements ensures that farmers are fairly compensated for the quality of their livestock, not just the quantity.
- Quality incentivisation: With clear quality metrics in place, farmers are incentivised to produce higher-quality livestock, benefiting from higher premiums.
- Enhanced feedback: The system provides farmers with detailed feedback on their livestock, enabling them to make informed improvements to their breeding and feeding practices.

Ultimately, the project delivers benefits to the end consumers with higher quality meat, increased transparency about the origin and processing of the meat they consume and providing sustainable choices as a result of improved operational efficiency and waste reduction that contribute to a smaller environmental footprint.

By integrating advanced technologies to optimise every facet of the meat processing chain, Triton has enhanced GMP’s operational capabilities and also provided benefits to farmers and consumers.

Will Barton, CEO, Gundagai Meat Processors (GMP), said: “Our journey with Triton has been nothing short of transformational. From the early days of our collaboration, it was clear that the evolution of our vision required a technology robust and advanced enough to be at the epicentre of our operations. With the introduction of the FUSION MES system, that vision crystallised. The system seamlessly integrates at the heart of our data warehouse, facilitating rapid commercialisation of pivotal technologies. Its ability to efficiently accept, link and disseminate data to various vendors is unparalleled, making our technological transition swift and smooth.

“One of the primary concerns for any business, especially in an industry as critical as ours, is data management, especially when it comes to third-party data. Triton has made this aspect of our operations almost effortless. Our interactions regarding data storage, retrieval and sharing have been straightforward, transparent and devoid of complications.

“Gundagai Meat Processors has always strived for technological excellence. We envision a future where we not only maintain our technologically advanced infrastructure but also consistently innovate and set benchmarks for the industry. This ambition would remain a distant dream without partners like Triton.”
From cereal, a jar of nuts, the sands of distant planets and the concrete in cities, granular systems surround us every day and these systems harbour secrets that could change the way things get mixed up.

In a paper published in *Proceedings of the National Academy of Sciences* (PNAS), scientists at the University of Rochester, including Rachel Glade, Fernando David Cúñez and Div Patel, studied granular materials and uncovered the role that grain shape plays in the behaviour of granular systems.

“Granular materials have peculiar behaviours,” Cúñez said, “but we don’t know a lot about exactly how they behave because their behaviour depends on so many different circumstances.”

The Brazil Nut Effect

Granular materials such as cereal, pharmaceuticals, sand and concrete commonly organise in such a way that grains segregate according to size rather than uniformly mixing. For example, in a jar of nuts, the largest nuts are commonly found at the top, a phenomenon known as the “Brazil Nut Effect”.

The Brazil Nut Effect can be a nuisance to many industries, including food and medicine, because it prevents uniform mixing. It also has influences in nature, where grain segregation can change the dynamics of geohazards like landslides, erosion and debris flows.

While the phenomenon is well known, it is not fully understood. Researchers have also traditionally focused on the size of grains, with most previous studies assuming that grains are spherical — a uniformity that rarely mirrors reality.

Shape-shifting dynamics

Glade and her team used advanced computer simulations comparing mixtures of spheres with mixtures of spheres and cubes in a rotating drum and in a river-like set-up to investigate how grain shape affects segregation in both dry and wet conditions, respectively. Their research revealed that even small differences in grain shape can significantly alter the dynamics of grain segregation.

Specifically, the researchers found the following patterns in the dry-system mixtures:

- In a mixture of different-sized spheres: segregation increases, with more of the larger spheres rising to the top, when the ratio between large-volume spheres and small-volume spheres is greater.
- In a mixture of spheres of the same size plus larger cubes: the segregation tends to be the same as the spheres-only case, with the larger spheres rising to the top.
- In a mixture of spheres of the same size plus smaller cubes: the segregation tends to decrease, with most of the larger spheres rising to the top but to a lesser extent than in the spheres-only mixture.

In a fluid system, the trend shifts to the opposite:
- In a mixture of spheres of the same size plus smaller cubes: the smaller cubes move to the top.

“One way to think of it is that grain shape changes segregation both quantitatively — in the dry drum case, cubes decrease the amount of segregation — and qualitatively — in the wet river case, cubes change the patterns of segregation,” Glade said.

Reshaping industry and nature

Future research will explore why these changes in segregation occur. According to the researchers, it’s likely due to several factors, including forces exerted on the different particles that make them stick together and resist movement in distinct ways.

Regardless, the study shows how important grain shape is across various domains.

“Our work demonstrates the importance of interdisciplinary research, drawing inspiration from physics, engineering and earth science. This collaboration paves the way for future work to better understand and predict geohazards, alleviate segregation issues in industrial flows and enhance our understanding of granular materials on Earth and other planets,” Glade said.
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Optimised system for bottle washing machine

German mineral water bottling plant Staatlich Bad Meinberger has implemented KHS HASYTEC Dynamic Biofilm Protection. This is a system for bottle washing machines and pasteuriser, which is said to be reducing deposits on machines with ultrasound as well as lengthening cleaning intervals and shortening downtime.

Staatlich Bad Meinberger said the system reduces deposits of biofilm, limestone and fibrous material from paper labels in the spray pipes on the KHS Innoclean EE bottle washer, for example. In the past, without this system machinery often became clogged with deposits that required a considerable amount of effort to remove. “The combination of paper and limestone in particular presented us with a real challenge, our colleagues often had to get to work with a chisel!” said Jannis Maas, plant manager responsible for production and supply at Staatlich Bad Meinberger.

“Before we installed the ultrasonic converter, the level of calcification on the machine had to be checked at the latest every two months and the machine then descaled and partly dismantled in order to remove the deposits formed. This took up an entire day that had to be blocked off in the production schedule or moved to a weekend. And even if the team is basically motivated to put in a shift on a Saturday or Sunday during the peak season if this is necessary, they’re understandably not desperate to do this work that’s strenuous and unproductive,” Maas said.

The results

The system, complete with two control units and 12 ultrasonic transducers, has been in operation for about 18 months now. In the end, the engineers’ curiosity won them over, resulting in the mineral water bottling plant being one of the first beverage operations to use this technology. “We often filled an entire wheelbarrow with deposits in the past; now we barely need a 20 L bucket. And this year we haven’t yet had to carry out a single acid treatment. The system is completely autonomous and practically maintenance free,” said Robert Mühlenweg, technical and logistics plant manager for the beverage producer.

The mineral water plant is also being supported in its striving for greater sustainability by the use of the new procedure. “On the one hand, the Dynamic Biofilm Protection system considerably lengthens the time between cleaning operations and reduces downtime, thus enabling a significant increase in production,” said Kathrin Gareis, service product manager at KHS. “On the other, the consumption of water, heat, electricity and chemicals such as citric acid used to descale components is greatly decreased by this system. Besides the cuts in operating costs this results in, this also helps to save energy and resources — an issue which is so important to our customers.”

From shipbuilding to the beverage industry

The technology isn’t new. What is new is that a procedure that’s been in use for many years in a completely different sector, namely shipbuilding, is now being applied to the beverage industry. The system is a simple plug-and-produce product where ultrasonic transducers cause the liquid in certain components of the machine to gently vibrate. The system is currently available for both bottle washing machines and pasteurisers, whether for new machines or as a conversion for existing systems.

It’s not just the time-consuming physical labour that’s hard work when it comes to cleaning machine parts. In the peak season especially, with the plant running at full capacity, finding an appropriate slot for cleaning often proves something of a headache.

“Before we installed the ultrasonic converter, the level of calcification on the machine had to be checked at the latest every two months and the machine then descaled and partly dismantled in order to remove the deposits formed. This took up an entire day that had to be blocked off in the production schedule or moved to a weekend. And even if the team is basically motivated to put in a shift on a Saturday or Sunday during the peak season if this is necessary, they’re understandably not desperate to do this work that’s strenuous and unproductive,” Maas said.

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Hydro cutting system for french fries
The tna conti cut is a hydro cutting system for french fries that uses ‘switcher’ technology to boost capacity, efficiency and uptime for users processing french fries.
The switcher technology can deliver many benefits. It can drive efficiency, productivity, reduced waste and uptime with designated alignment tubes and integrated knife blocks. Both are exchangeable, depending on the final product to be processed and potato size used.
The system is designed to achieve the longest cut size possible when processing potatoes in high volumes through the alignment tubes. An interchangeable knife block enables potatoes to be cut into different shapes and sizes, such as: sticks, wedges and slices.
Using a smooth cutting surface, the system is claimed to result in less oil pick-up compared to a mechanically cut surface, reducing oil usage and fat content.
A blockage can be detected by means of a pressure transmitter or flowmeter installed in the switcher (eg, broken knives/product stuck in knife block). Uptime can be maintained as the switcher automatically rotates the revolver to a new alignment tube and knife block, allowing the operator to take out the clogged knife block and replace the knives.
Working with TNA experts to determine the correct configuration for a specific french fries processing line is highly recommended.

tna solutions Pty Ltd
www.tnasolutions.com
**Aseptic block for bottle sterilisation**

The new KHS rotary aseptic filler for higher capacities is focused on bottle sterilisation that — unlike preform sterilisation — can also be combined with the KHS FreshSafe PET coating system that provides additional product protection for sensitive beverages. This procedure is claimed to remove all potential germs from the containers directly prior to filling. It is designed to provide bottlers with more flexibility and greater availability during format changeovers than with preform sterilisation, where changing the stretch blow moulds disturbs the sterile state of the block.

The rotary Innofill PET ACF-R filler has been combined with the energy-efficient InnoPET Blomax Series V stretch blow moulder. The resulting InnoPET BloFill ACF-R aseptic block for bottle sterilisation currently has a capacity of up to 36,000 1.0 L bph as opposed to the linear fillers that work at a maximum rate of 14,000 bph. In the future, the block will be available with an output of up to 48,000 500 mL bottles every 60 min. In addition, the new plant engineering achieves a sterility of log 6 inside the bottles, which is equivalent to a reduction in germs of 99.9999%.

The system is spread out over two levels: at ground level are the stretch blow moulder, sterilisation module, filler carousel and two-way servocapper. The process technology with the service module, H₂O₂ preparation, sterile compressed air production, cap sterilisation unit and valve manifold are up on the platform.

Thanks to its flexibility, the modular aseptic filler is suitable for use with various KHS PET filling systems that have also been modified. These vary their speed according to the respective filling phase and determine the fill level using flow metering. The current standard comprises valves with a free-flow system for the still beverages normally filled on aseptic equipment. Alternatively, systems can be used that are able to process fibres and pulp. In the future, the machinery is also to be capable of the sterile filling of carbonated products such as fruit juice spritzers.

*KHS Pacific Pty Ltd*  
www.khs.com

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**Case packing infeed module for shaped containers**

The Sidel Cermex ProSelex case packing infeed module is designed to handle complex and innovatively shaped containers and bottles while preserving container stability throughout the process.

The system is fast and easy to use with changeovers from 1 min to 2.5 s.

Due to a small number of change parts required, the module also delivers cost efficiency and overall time-to-market optimisation for new formats in the future.

*Sidel Oceania Pty Ltd*  
www.sidel.com

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Traditionally, chemical preservatives like sodium metabisulphite (SMP), sodium nitrate and nitrate have been used to prevent the growth of bacteria or rancidity in meat products. Now an Australian native bushfood is showing some promise as a natural alternative for preserving meat, according to University of Queensland research.

Queensland Alliance for Agriculture and Food Innovation PhD scholar Michel Beya (pictured right) said the Kakadu plum’s high antioxidant and antimicrobial properties make it suitable for a plant-based preservative to extend the shelf life of meat.

“The extraordinarily high vitamin C content of the fruit, which is one of nature’s most potent antioxidants, offers powerful preservation qualities,” Beya said.

“It works by inhibiting the growth of bacteria and prevents the oxidation of meat products.”

Beya, who worked with the Centre for Uniquely Australian Foods on the project, said consumers are increasingly concerned about how meat is preserved because of health, environmental and ethical considerations so Kakadu plum is now being explored as a chemical-free alternative.

The researchers created a Kakadu plum powder (KPP) which was tested on refrigerated raw beef patties under modified atmosphere packaging. The research compared beef treated with KPP to beef treated with SMB and a control group with no additive.

Lipid oxidation, microbial growth rate, pH, instrumental colour and surface myoglobin were studied. Total phenolic compounds (TPC) and vitamin C of the KPP were also measured.

“Our results show beef patties preserved with Kakadu plum had a significant reduction in rancidity rates as well as inhibiting microbial growth more effectively than samples without preservatives,” he said.

“What’s more, including Kakadu plum in the recipe does not affect the taste of the meat.”

Kakadu plum has been consumed for its nutritional and therapeutic value by Indigenous Australians for thousands of years. Beya said his research showed preservation was another avenue for using Kakadu plum in Indigenous enterprise while allowing for inter-generation transferral of knowledge and customs.

The detailed research findings have been published in Meat Science.
Mars steams ahead — renewable technology for pet food process

Paul Matuschka, Sustainability – Operations Lead at Mars Petcare Australia.

As cities worldwide record their highest-ever temperatures, sea levels continue to rise and extreme weather events like bushfires, floods and electrical storms become more frequent, our leaders must address environmental concerns by rethinking and reframing our approach to living and thriving on planet Earth. At the frontline of leadership climate action, bold new sustainability practices must be initiated by large organisations and driven both internally and through the wider stakeholder ecosystem.

For Mars, sustainable practice is about acceleration, affordability and achievability. Globally we have just announced that we will be investing $1 billion over the next three years to drive climate action — from farm to table and pet food bowl, supply chain to the grocery store and home to veterinary clinics. Mars has also committed to cut 50% of its emissions — approximately 15 million metric tons — by 2030 across its full global value chain.

Closer to home, Mars Petcare Australia has developed an open-source plan in the pursuit of sustainable productivity by creating a ‘world-first’ pioneering solution for how the company manufactures pet food, whilst simultaneously decreasing its carbon emissions and footprint.

The deployment of ‘Green Steam’ at Mars Petcare’s Wodonga facility is the result of a successful collaboration with Graphite Energy and represents Australia’s first commercial use of an Electric Thermal Energy Storage (eTES) system for the production of process heat in manufacturing.

Commencing operations in June 2023, this innovative approach allows our factory in Wodonga, Victoria, to use renewable steam to cook pet food products. It does so by using renewable electricity generated by low-cost daytime photovoltaic (PV) electricity (solar) to generate and store heat at temperatures of up to 700°C in Graphite Energy’s orange box.

The eTES system allows the stored heat to be converted into high-quality steam on demand to cook Mars Petcare’s pet food for the nation’s six million dogs and five million cats.

To date, the Green Steam system has helped decrease the Wodonga factory’s gas consumption by 20%, with a corresponding reduction in emissions, and is replacing up to 9000 GJ/year of natural gas. The success to date also demonstrates Mars Australia’s intention to take a lead role on accelerating the longer-term market decarbonisation opportunity and helping the wider organisation achieve its net zero goals as the company transitions to 100% renewable energy.

Change such as this only occurs when individuals and organisations shift their thinking, harness the power of sustainable practices and envision a better future for our world. The success of the Green Steam venture is testament to our collaboration with Graphite Energy and the CSIRO’s Australian Solar Thermal Research Institute, a symbiotic relationship that has enabled real-life integration experience for our partners and benefited Mars globally through groundbreaking exposure to such new tech.

Mars Petcare’s long-term goal is to continue its collaboration with partners such as these as well as work more closely with the Victorian Government and leading industry bodies to help influence and drive positive change that supports Australia’s sustainability challenge. However, time is of the essence, and the next six years will be critical as we look to grow Green Steam’s footprint across Australia and the rest of the world.

Mars Petcare’s goal is to achieve 100% renewable energy by 2040 and full decarbonisation by 2050. Thanks to sustainable innovation such as the Green Steam technology, goals such as these will be feasible without having to make a trade-off between the planet and productivity.
**Breading ingredients range**

Ingredients specialist Loryma has a wide range of ingredients for all types of coated products. The Lory Crumb portfolio includes a number of extrudates in various shapes and colours for breading. With a unique appearance and crunch, they are suitable for plant-based meat alternatives, vegetable sticks, meat and fish products, and desserts. A selection of native and modified starches is designed to provide good adhesion and crispness in batters, tempura coatings and dustings.

Alongside granulated Lory crumb variations based on maize, rice, potato and wheat, the portfolio also includes innovative shapes such as triangles, crescents, discs and balls in an array of different colours. The functional ingredients optimise the breading texture and are characterised by high temperature and colour stability. As a result, visual appeal is good even under demanding conditions, thus allowing for the creation of added-value breaded products.

Loryma also produces a selection of native and modified wheat starches with different technological properties.

Lory Starch Saphire pure is a wheat starch with high adhesion and processing stability, which makes it suitable for batters, tempura and a pre-dust for added crunch. It also has no E-number, making it suitable for clean label products.

Modified wheat starch Lory Starch Solaris, meanwhile, is suitable for viscosity control in batter and tempura coatings due to its cold swelling capacity and process stability.

In addition, Lory Starch Achat is designed to retain low viscosity even at very high temperatures, thus optimising the crispness and adhesion of tempura coatings.

*Loryma GmbH*

[www.loryma.de/en/](http://www.loryma.de/en/)

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How fresh are your tenderloins?

Despite the technological advances keeping meat fresh for as long as possible, certain aging processes are unavoidable. Adenosine triphosphate (ATP) is a molecule produced by breathing and responsible for providing energy to cells. When an animal stops breathing, ATP synthesis also stops, and the existing molecules decompose into acid, diminishing first flavour and then safety. Hypoxanthine (HXA) and xanthine are intermediate steps in this transition. Therefore, assessing the prevalence of HXA in meat is a good indicator of food freshness.

While many HXA sensing methods currently exist in the food industry, they can be costly and time-consuming and require specialists. Researchers from the Vietnam Academy of Science and Technology, VNU University of Science, Hanoi University of Science and Technology, and the Russian Academy of Sciences have now developed a biosensor using graphene electrodes modified by zinc oxide nanoparticles to measure HXA.

In comparison to modern food-testing methods, like high-performance liquid chromatography, gas chromatography, mass spectrometry, atomic and molecular spectroscopy and nuclear magnetic resonance spectroscopy, the biosensor has been designed to offer advantages in time, portability, high sensitivity and selectivity.

The sensor is produced using a polyimide film, which is converted into porous graphene using a pulsed laser. The added zinc oxide nanoparticles attract the HXA molecules to the electrode surface. When HXA interacts with the electrode, it oxidises and transfers its electrons, spiking the electrode’s voltage. The linear relationship between HXA and voltage increase enables easy determination of HXA content.

To assess the sensor’s ability, the researchers tested solutions with known quantities of HXA and achieved good results. They then measured the biosensor’s practicality using pork tenderloins purchased from a supermarket. The sensor performed with over 98% accuracy, favourable detection range and low detection limit.

The sensor is designed to be suitable for not just pork meat — it can be used evaluate any type of meat.

The research findings have been published in AIP Advances.
**Mobile sanitary screw conveyor**

Flexicon has released a Twin Tilt-Down Flexible Screw Conveyor system with dual hoppers on a common mobile base, constructed and finished to 3-A sanitary standards.

Ready to plug in and run, the self-contained system can fill two vessels with the same material simultaneously, or convey two different materials. Mounted on a frame with locking castors for in-plant mobility, it can be used in multiple locations and rolled to a washdown booth.

Each 113 L hopper is equipped with grates capable of supporting a 115 kg bag of material, level sensors and mechanical agitator assemblies to promote flow into the conveyor inlets.

The two BEV-CON conveyors are engineered to move dry bulk solids efficiently without product degradation, especially non-free-flowing materials that pack, cake, smear, fluidise, compress or are otherwise problematic to convey. The screws are the only moving parts contacting material and are driven beyond the point at which material is discharged, eliminating wear and contamination related to product contacting seals and bearings.

Discharge housings of the conveyors are supported by dual motorised booms that cantilever from the mobile base, allowing discharge of material into processing equipment or storage vessels. The support boom and conveyor assembly can be tilted down to manoeuvre through standard doorways and aisles, and around corners for use anywhere in the plant.

The system is constructed to 3-A standards and features sanitary quick-release clean out caps, quick-disconnect discharge box access covers and washdown motors.

The stainless IP65 (NEMA 4X) control panel allows operation of either or both conveyors. HMI controls allow manual and automatic start/stop, reverse and variable speed adjustment.

**Standalone weigh systems**

Enmin’s fill-weigh-pack Linear weighers are the latest addition to help round out the Generate Plus modular system range.

The weighers are hygienically designed and easy-to-clean single, dual or triple linear weigh systems that provide semi- and fully automated weigh and filling solutions.

Using linear vibration, both surge and dribble feeding is designed to provide consistency in pack, box and bulk fill weights.

The systems aren’t designed for one-fit-for-all purposes, a level of customisation can be designed to help ensure they integrate seamlessly into any existing production line.

The company’s single, dual or triple linear weigh systems can handle a wide variety of packaging types and product combinations. From wrapped to raw product, a solution to help promote line efficiency, reduce wastage and improve product quality can be provided.

**Enmin Pty Ltd**
www.enmin.com.au
Predictable puree: a smart food formulation approach

Apple puree is a major market player, integral to various products, yet its quality varies with the diversity of apple cultivars and processing conditions. For fruit processors, the ever-increasing variability of raw fruits means that their empirical know-how may not be sufficient to produce expected and constant final purees. Recently, advances in visible and near-infrared (Vis-NIR) spectroscopy have shown potential in predicting puree quality by analysing the spectral data of apple varieties.

*Food Innovation and Advances* published an online paper entitled ‘Infrared guided smart food formulation: an innovative spectral reconstruction strategy to develop anticipated and constant apple puree products’ on 19 March 2024. The paper proposes a smart food formulation model to optimise puree formulation, aiming to reach the anticipated and constant quality of final products.

This study describes an innovative concept concerning the feasibility of using infrared spectroscopy to drive the formulation of apple purees issued from the mix of single-cultivar purees. An innovative chemometric method based on multivariate curve resolution-alternative least squares (MCR-ALS) coupled with the spectra of single-cultivar purees was firstly tested to reconstruct the spectra of formulated purees.

PLS regression models coupled with selected Vis-NIR spectral variables demonstrated good prediction abilities for colour parameters, viscosity (η50), total sugar content (TSC), titratable acidity (TA), pH, glucose and malic acid content in formulated purees. PLS models were developed using the reconstructed Vis-NIR spectra of all formulated purees and predicted their a* colour value (Rp2 = 0.92, PRD = 3.30), TSC (Rp2 = 0.86, PRD = 2.64), TA (Rp2 = 0.85, PRD = 2.55) and malic acid (Rp2 = 0.86, PRD = 2.67). Although prediction results for TSC and TA based on reconstruction spectrum were less accurate than direct spectral analyses, these results still opened a potential way to directly estimate the variation of sweetness, acidity and colouration for formulated purees based only on the selected Vis-NIR spectral variables of single-cultivar purees.

This is claimed to be the first report demonstrating that Vis-NIR spectroscopy has the potential to guide puree formulation: a multiparameter optimisation of texture and taste (viscosity, colour, sugars and acids) of final apple purees can be obtained using only the spectral data of single-cultivar purees. The successful application of this spectral reconstruction strategy offers new insights into optimising puree formulation for consistent quality, marking an advancement in the field of food technology. This chemometric approach can not only enhance the predictive modelling of apple puree characteristics but also opens avenues for its application in smart food formulations.
CASE STUDY

Speedy system to stop spoilage in beer brewing

Researchers at a startup in Brazil are working to develop a system that detects the presence of microorganisms capable of marring a beer’s flavour and aroma in more stages than ever of production.

Supported by FAPESP’s Innovative Research in Small Business Program, EasyOmics researchers are developing a tool that can be used by breweries in all stages of beer production and at points of sale. Whilst breweries already watch out for beer spoilage microorganisms during production, this tool aims to make spoilage checks at other points of the brewing process previously unavailable, including the testing of raw materials.

The system can have a result in an hour, compared with one or two weeks for conventional test results. “The faster it can be done, the better. The longer the liquid is held in the tank, the longer it takes to produce the beer,” said Rene Aduan Junior, a biotechnologist and master brewer at EasyOmics.

If a small quantity of spoilage microorganisms is detected before the bottling stage, the microorganisms can be eliminated or made inert with seven or eight pasteurisation units (PUs). One PU is defined as one minute at 60°C or the equivalent time-temperature effect on microorganisms. Beer is typically given 10–100 PUs, but 5 PUs is enough in most cases. “Higher levels of contamination require more PUs,” Aduan said.

Proof of concept has been completed and the system will be in use at breweries in Brazil before the year is out. This device is estimated to cost around AU$18,300. “We want to offer a cheaper option for smaller breweries. Although the giants dominate the market, with a share approaching 90%, we want to offer a solution for micro, small and medium producers. We know how important it is to help innovation penetrate areas where it’s lacking,” Aduan said.

With future development and specifications, the concept could also be used in tools for other segments of the food and beverage industry.
GENERATE+ MODULAR SYSTEMS OPEN UP A WHOLE RANGE OF POSSIBILITIES.

Combined together, Enmin’s Generate+ modular systems offer a full turnkey solution: Box erect, bag insertion, season, weigh and fill, bag seal, box close and inspection are just a handful of the systems we can offer.

Designed and built right here in Australia, all of the systems adhere to the stringent hygiene standards of the food industry. Constructed of 304 stainless steel and with an IP66 rating, they offer outstanding reliability and durability.
**Process liquid chillers with scroll compressors**

MTA — a Trane Technologies brand, will be exhibiting at ARBS 2024 at ICC Sydney, 28–30 May 2024, with a focus on air-to-water and water-to-water chillers and heat pumps that offer low GWP HFO and natural refrigerant heating and cooling solutions.

On display at MTA’s stand 758–759 will be the TAE G air-cooled process chillers, specifically designed for use in demanding industrial applications.

With a cooling capacity of 7–254 kW, the TAE G is the result of MTA’s commitment to the green transition of energy systems, obtained by combining its process chillers with the use of environmentally friendly R513A and R454B refrigerants, as an alternative to R410A.

The chiller configuration includes an accumulation tank and a pump integrated into the unit as standard, thus offering a plug-and-play solution. A wide range of options, combined with wide operational limits, allows the solution to adapt to a large variety of process cooling applications.

*MTA Australasia*

www.mta-au.com

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**Embedded box PC**

Featured by Interworld Electronics, the Aplex ACS-500 is a rugged, compact (253 x 159 x 36 mm) embedded box PC with powerful performance and a range of industrial features suitable for a wide variety of food processing, manufacturing and automation applications, even where space is limited.

The ACS-500 features an 11th Gen. Intel Core i3/i5 processor and up to 64 GB DDR4 SoDIMM. It is constructed with a heat sink and fanless design, a tough aluminium chassis, a wide operating temperature (-20--60°C) and support for a wide range 9–36 V power input, enabling it to continuously operate even in harsh food processing environments.

It features 4 x USB 3.0, 2 x COM and 2 x GbE LAN with high-speed data transmission. Moreover, with the equipped DP/HDMI combo port, operators can easily attach a touch screen monitor for monitoring and control. The unit also supports Windows 10 IoT and Windows 11, and it can be panel or VESA mounted. It also features an optional backup battery that can help to decrease damage due to power outages.

*Interworld Electronics and Computer Industries*

www.ieci.com.au

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**Modbus gateway**

The Aplex SiER-G1101M is an Industrial 1-port RS-232/422/485 Modbus Gateway, a part of the SiER series designed for smart manufacturing. The solution is engineered with IoT capabilities to facilitate industrial and manufacturing transition towards a digitising information environment an industrial setting.

The system supports 32 Modbus TCP master and slave mode devices. It has 10/100BASE-TX RJ45 transmission distance up to 100 m.

*Backplane Systems Technology Pty Ltd*

www.backplane.com.au
Photoelectric proximity sensor

The SICK W10 photoelectric proximity sensor is a laser triangulation sensor designed to solve a range of detection tasks in automation technology. With an intuitive touchscreen operation for ease of use, it has selectable operating modes, stainless steel housing in IP69K and IO-Link functionality.

The sensor series comprises four variants, which differ in their operating distances and mounting options. The Class 1 laser light source, in conjunction with the receiver evaluation line, is designed to deliver precise detection results with high repeat accuracy.

Three application-optimised operating modes can be activated just as easily via the display as foreground or background suppression if required. Situation-dependent teach-in options allow the sensor to be adapted to individual application scenarios. The stainless steel housing with IP69k protection protects the sensor even when used in demanding ambient conditions. Thanks to IO-Link functionality, the photoelectric sensor has the option of remote configuration and integration of the recorded sensor data into an existing automation network.

Suitable for a range of applications across numerous industrial sectors and innovation sectors, the sensor is particularly suitable in factory and logistics automation applications — eg, for the detection of objects with different or challenging surface properties such as gloss, colour or structures.

The sensor has a screen lock that protects the settings against access or unwanted changes by third parties. The short-range version has working distances between 25 and 400 mm and the long-range version ranges from 25 to 700 mm. In speed mode, the response time is 1.8 ms.

SICK Pty Ltd
www.sick.com.au

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Heat-resistant cables

LAPP Australia’s ÖLFLEX heat cables are designed to handle high-temperature environments.

From furnaces and foundries, through to commercial baking applications, steel mills, glass factories and other high-temperature applications, heat-resistant cables are critical to keeping machinery running efficiently with minimal downtime.

To maximise the uptime of machinery in these harsh environments, LAPP Australia’s ÖLFLEX heat-resistant wire cables feature silicon and finely stranded tinned copper for high-quality functionality and high levels of heat protection.

All cables in the heat range are halogen-free, which is an advantage to safety of personnel and equipment.

The range can also optionally include resistance to UV-radiation, abrasion, tears, oil, weather and flame.

Depending on the product, the heat range can handle temperatures up to 400°C over long periods of time, or up to 1565°C for short periods.

LAPP Australia Pty Ltd
lappaustralia.com.au

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Angle seat valve

SMC Corporation Australia New Zealand (ANZ) has introduced its JSB series angle seat valve, which is designed to provide benefits such as boosting flow rates and reducing pressure loss.

With a long service life and a large flow rate, the series is suitable for steam, air and water applications in a range of industries such as water management, dairy, food & beverage and other process controls.

The air-operated valve features an angle seat structure to minimise pressure loss. It can deliver up to three million cycles for steam applications and up to 10 million cycles in air and water applications. Thanks to the optimised flow channel shape, a larger flow rate is possible, with a valve flow coefficient of approximately 2.5.

The addition of a new scraper function to the squeeze seal inside the valve is designed to enable more effective shut-off of fluid leakage. A guide bushing is designed to prevent misalignment of the valve components during operation and lengthen the life of the squeeze valve.

The all-in-one valve with stainless steel construction is available with port sizes in 3/8 to 2” and is capable of handling fluids with high temperatures (up to 183°C for steam and 99°C for air and water).

With its compact design (measuring just 166 mm in height), a built-in visual indicator and low maintenance requirements, the valve is easy to install and to use.

It is available in seven size variations, to suit different application requirements, with optional fittings available for pilot ports and breathing ports.

SMC Australia | New Zealand
www.smcanz.com

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DICING

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In Latin America, Arla Foods Ingredients has launched a fermented beverage concept that demonstrates how dairies can reduce waste and increase yield by upcycling whey. Raw material waste can be a problem for dairies. After processing, many are left with large whey side streams, which can cause environmental damage if discharged with wastewater.

This new fermented beverage concept is based on upcycled acid or sweet whey. It also contains Nutrilac whey proteins, which provide a light texture and refreshing taste, as well as protein content as high as 8%, so that a 200 mL bottle would contain 16 g of protein.

Nutrilac is designed to provide higher heat stability to standard milk protein concentrate or whey protein concentrate. This allows for the development of creamy low-viscosity beverages without sedimentation, sandiness or dry mouthfeel. Low in fat and containing no added sugar, the beverage can be produced on standard yoghurt lines with minimal investment.

Ignacio Estevez, Application Manager, South America at Arla Foods Ingredients, said: “Consumers hate the idea of waste, especially if it’s environmentally harmful. Reflecting this, we’re starting to see more and more products that make use of upcycled ingredients and communicate it on their packaging. Getting value out of whey is a significant challenge in dairy production but, as this concept demonstrates, it can be used to create on-trend new products that appeal to both sustainability-conscious and protein-focused consumers. The fact that it can be produced easily and with minimal investment provides an additional incentive to innovate.”
Behind every delicious chocolate that’s flawlessly safe, there’s a manufacturer’s commitment to equipment cleanliness that makes all the difference. Invisible threats lurk within the gleaming machinery of chocolate production. If sanitation processes falter, harmful bacterial growth could thrive in equipment crevices, tainting the sweet indulgence we know and love. Thankfully, meticulous design — down to the unassuming valve — plays a vital role in preserving chocolate’s purity. Discover how advanced hygiene solutions and smart technology come together to ensure that each bite of chocolate is pure enjoyment.

**From bean to bar: the steps Involved**

1. **Sourcing and fermentation:** Chocolate’s journey begins long before the factory. Cacao pods are harvested from *Theobroma cacao* trees, mainly grown in tropical regions. Ethical sourcing practices are increasingly important, with manufacturers opting for fair-trade cacao beans. Fermentation is vital — pulp-covered beans undergo a multi-day process in boxes or piles, where specific bacterial and yeast activity initiates flavour development and reduces bitterness.

2. **Roasting, winnowing and grinding:** Roasting is where the familiar chocolate aromas emerge. Heat intensifies flavour precursors created during fermentation using methods like drum roasters or convection ovens. Winnowing cracks roasted beans, releasing the core of the bean (nihs) while discarding less desirable shells. Nibs are then ground into a thick paste called cocoa liquor, containing both cocoa solids and cocoa butter. Presses, controlled by valves, then separate the liquor into its essential components.

3. **Formulation and conching:** This is where chocolate artisans shine. Combining different cocoa liquors creates unique flavour profiles. Sweeteners (like sugar), milk solids (for milk chocolate), emulsifiers (commonly soy lecithin for smoothness) and flavourings like vanilla may be added. Industrial valves, including diaphragm valves for their hygienic design, precisely control the introduction and blending of these ingredients. Conching is an extended mixing process at controlled temperatures that refines flavour, eliminates unwanted acidity and creates a velvety texture. Valves are used within the heating and cooling systems of conching machines.

4. **Tempering, moulding and beyond:** Tempering creates that perfect sheen and snap in the final chocolate. Heating and cooling the chocolate to specific temperatures realigns cocoa butter crystals. Valves within the tempering equipment play a vital role in temperature regulation and chocolate transfer. Whether forming simple bars or intricate shapes, diaphragm valves are designed to ensure accurate chocolate flow into moulds or during enrobing, while minimising build-up that could compromise hygiene.

**Maintaining purity and flow with industrial valves**

The journey of chocolate is filled with transformations — from cocoa bean into decadent bars. These processes require precisely controlled flow and temperatures. Industrial valves are essential gatekeepers at each stage:

- **Regulation:** Ensuring the right quantities of ingredients travel between vats or machinery for accurate flavour profiles.
- **Hygiene:** Valve design must withstand vigorous cleaning protocols and minimise build-up of potentially harmful residues.
- **Variety:** Different valve types (from diaphragm to ball valves) suit specific tasks due to temperature or pressure handling, plus chemical resistance capabilities.

**Hygiene imperatives and advanced solutions: creating chocolate that can be trusted**

Chocolate manufacturing may seem simple, but maintaining perfect hygienic standards across complex equipment and a multi-stage process requires the right solutions. These modern methods ensure nothing compromises the enjoyment of chocolate.

**CIP (clean-in-place):** CIP systems revolutionise sanitation in chocolate production. Without needing to dismantle entire processing lines, powerful cleaning solutions and rinses are circulated thoroughly, minimising contamination risks and leaving no traces that could taint future batches.

**Choosing the right valves:** It might seem like a technical detail, but it greatly impacts product safety. Diaphragm valves, for instance, have smooth designs that prevent chocolate or cleaning fluids from becoming trapped — eliminating potential breeding grounds for unwanted microorganisms. Furthermore, PTFE-lined valves exhibit good resistance to harsh cleaning chemicals, preventing corrosion that could jeopardise food safety over time.

**The science of sweet reassurance**

All these hygienic technologies work behind the scenes to protect the purity and integrity of chocolate. Behind each confectionery indulgence is a team of experts who understand the crucial link between hygiene, food safety and a carefree chocolate experience.

Shrink-wrapping packaging machine

EvoFilm, Sidel’s high-speed seamless shrink-wrapping range, uses a new stretch film technology that is designed to achieve 90% energy savings and a 50% reduction in plastic film.

By removing the need for any heat, the wrapping technology involves pre-stretching the film and wrapping it around the primary packaging. It reduces plastic film consumption while using less energy.

With speeds up to 80 packs/min, the solution is designed to stretch the film and apply the correct wrapping force to most packaging formats.

Sidel Oceania Pty Ltd
www.sidel.com

Safety air guns

EXAIR safety air guns have been designed to eliminate the safety issues associated with some low-cost air guns. They are built to be durable and comfortable, with each model using an engineered air nozzle that entrains large volumes of surrounding air. Low air consumption and noise level help to ensure safe operation, and all models are OSHA compliant for noise and dead-end pressures.

VariBlast Precision Safety Air Guns are lightweight with low airflow and force up to 230 g. They have a variable flow trigger with ¼” air inlet, and their small diameter nozzle and extension fits into tight spaces.

VariBlast Compact Safety Air Guns have low to medium airflow and force up to 454 g, a variable flow trigger with two ¼” air inlets and a cast aluminium body with hanger hook.

Soft Grip Safety Air Guns have medium to high airflow and force up to 1.497 kg. They have a full-finger trigger, padded grip with ¼” air inlet and a cast aluminium body with hanger hook.

Heavy Duty Safety Air Guns have medium to high airflow and force up to 1.497 kg. They have a wide curved trigger, rubber grip with 3/8” air inlet and cast aluminium body.

TurboBlast Safety Air Guns have very high airflow and force up to 10.43 kg. Ergonomic with a soft handle, they have a one-finger push-button trigger, 1” air inlet, adjustable airflow and automatic air shut-off if dropped.

Super Blast Safety Air Guns have very high airflow and force up to 10.43 kg. They have a spring-loaded ball valve trigger, foam handle, 3/8” up to 1-14” air inlets and automatic air shut-off if dropped.

Chip Shields to protect workers from flying debris and prevent splash back are available for VariBlast Precision and Compact Safety Air Guns, Soft Grip Safety Air Guns and Heavy Duty Safety Air Guns.

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CASE STUDY

Nut food maker uses self-cleaning filter for cooking oil recovery process

With the cost of cooking oils rising, food manufacturers are looking for solutions to optimise their food processing. One such solution is to reuse the cooking oil used in production processes by filtering out contaminants after use, such as burnt food debris.

Milhans Foods, a food manufacturer of Turkish nut products, has now adopted high-temperature self-cleaning filters for its cooking oil recovery process.

The Self-Cleaning Russell Eco Filter from Russell Finex allowed the food manufacturer to overcome challenges such as frequent downtime, inconsistent filtration quality and low throughput by replacing its 80-micron paper filtration system with a 50-micron self-cleaning filter.

The company achieved ROI in just eight months, by eliminating the need for replacement paper filter cartridges.

The integrated solution provided other benefits, such as:
  • enhanced productivity by minimising downtime and automating processes;
  • improved filtration quality and throughput rates with finer micron filtration and a self-cleaning design;
  • operator safety with an enclosed design, reducing exposure to hot oil.

Russell Finex is a specialist in sieving and filtration equipment and can tailor solutions through machine trials to meet user requirements.

Russell Finex Limited
www.russellfinex.com/en/

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www.foodprocessing.com.au | May/June 2024
**Tub filler**

HMPS launched a new tub filler at APPEX 2024 that includes integrated Rockwell Automation digital transformation software. The Rockwell technologies include Compact GuardLogix5380, ASEM 6300, FactoryTalk Optix, Kinetix 5700 and Safety GuardLink.

The tub filler can be used to more efficiently package products such as yoghurt, ice cream and dips.

FactoryTalk Optix is part of Rockwell’s family of industrial digital transformation software, built for supporting an ecosystem of advanced industrial applications, including IoT. It uses technology designed to make collaboration easier, with simple, intuitive touch screens that operate directly through a web browser.

HMPS is a Gold OEM Partner within Rockwell Automation’s PartnerNetwork program, which means they have committed to using Rockwell’s content across their product portfolio, as the two companies work collaboratively to deliver innovative solutions to the market.

*Rockwell Automation Australia*

www.rockwellautomation.com/en-au.html

*HMPS*

www.hmps.com.au

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**Low-pressure compressor system**

The Low Pressure Turbo 150 (LPT) from BOGE is designed to provide good efficiency values at an operating pressure between 2 and 4 bar. With a compact design and quiet operation, the 100% oil-free compressed air compressor is suitable for sensitive applications.

The technical co-ordination of permanent magnet motor, air-cushioned drive and two-stage compressor system is designed to ensure a high level of efficiency. A frequency converter adapts the compressor to the compressed air requirement accordingly. The smart focus 2.0 control optimises energy consumption and load. The entire compression process works without the need for oil.

Thanks to the air-cushioned motor shaft and entirely dispensing with lubrication, it provides class 0 oil-free compressed air. The technology is designed to be low-wear and low-maintenance because neither the gears nor the oil or filters need to be replaced.

Users have the option to purchase the LPT 150 with heat recovery, which is designed to save up to 80% energy.

*Boge Compressors (Australia) Pty Ltd*

www.boge.net.au
any brewers can find it challenging to keep kombucha’s alcohol levels low because the bacteria and yeast used in the fermentation process vary from batch to batch.

Now chemists from Shippensburg University are investigating how to reliably minimise alcohol levels in kombucha, tailor taste profiles and speed up the fermentation processes to help producers optimise the production of the fermented tea.

Kombucha brewing typically begins with a glass jar filled with tea, water, sucrose and a fermentation starter called a SCOBY — short for a symbiotic culture of bacteria and yeast.

The research, presented at the spring meeting of the American Chemical Society, investigated the use of silicone bags as an alternative to glass jars for brewing kombucha. It found that a silicone bag’s porosity, compared to a glass jar, exposes the SCOBY to more oxygen, which speeds up the brewing process — including ethanol breakdown and acid production — cutting production time from about two weeks to one week.

However, the researchers found that there were inconsistent levels of dissolved oxygen in the silicone bags compared to the glass jars so further research is needed to discover the full reason why the silicone bag is a better brewing vessel for reducing ethanol.

The tea brewed in a silicone bag was reported to be just as delicious as tea brewed in a glass jar by the taste testers.

The researchers also noticed that they were getting more gluconic acid with silicone bag brewing compared to glass jars.

“We think this acid will become more popular with brewers,” said Jeb Kegerreis, a physical chemist and one of the team’s principal investigators. “Gluconic acid provides acidity without the sour vinegar taste you get from acetic acid, and that may appeal to more tastebuds.”

Because gluconic acid is a product of bacteria fermenting glucose, the researchers investigated how starting with glucose or fructose instead of sucrose changes the kombucha fermentation process and taste. “During the fermentation process, yeast in the SCOBY breaks sucrose into glucose and fructose,” said chemistry undergraduate student Abbi Czarnecki. “By using just glucose or just fructose, we looked at how removing that first step affects the whole brewing process.”

The team found that using glucose as the SCOBY food source created a kombucha with more gluconic acid and minimal ethanol. With fructose, the researchers measured more acetic acid and more ethanol. “If minimising ethanol production is the measure of our success,” said Ian Loscher, a chemistry undergraduate and one of the team’s poster presenters, “fructose failed in that department. Out of all three sugars, it produced the most ethanol.”

Principal investigator John Richardson said the fructose brews tasted sweeter. “I prefer a less sweet kombucha, but it’s not necessarily bad,” he admits. What’s important to the team is sharing what they have discovered about different sugars and fermentation vessels because that information can help brewers create a kombucha that hits all the flavour notes and characteristics they want to aim for.

Visit the ACS Spring 2024 program to learn more about these presentations, ‘Comprehensive comparison of the dynamics of kombucha fermentation in a silicone bag and a glass jar’ and ‘Investigating the impact of sugar source variation on kombucha fermentation’, and other scientific presentations.
Grain analyser

CropScanAg has released the CropScan 4000VT On Combine NIR Grain Analyser fully integrated version of the CropScan analysers. The system is ISOBUS compatible with the latest CASE IH and New Holland brand of combines. It runs a Virtual Terminal within the CNHi Pro 700 and Intelliview IV combine monitors.

The product includes a remote Sample Head that is fitted to the clean grain elevator of the combine, a fibre-optic cable, communications cable and a waterproof and dustproof NIR spectrometer that is mounted on the wall of the combine outside the cabin. The NIR spectrometer includes an electronic control unit that runs the CropScan software and reads the combine’s CANBUS messages. The CAN messages for yield, GPS, crop type, grower-farm-field, rotor engage and more are read by the CropScan ECU to control operation and data collection.

It is integrated into the CNHi Pro 700 and Intelliview IV monitors using a purpose-designed VT screen. Once turned on, the screen is available on the Pro 700 and Intelliview IV monitors. The operator simply selects the Crop Type and Grower-Farm-Field menus. Once the rotor is engaged by the operator, the CropScan begins to analyse the grain as it is collected in the Remote Sample Head. The protein, moisture, oil, starch and fibre are calculated and combined with the yield and GPS data from the CANBUS messages and then sent to the VT screen. Results are displayed on the VT screen every 3-4 s.

The field data is stored in the ECU and then sent to the CropScanAg Cloud Server, where users can access grain logistics, field maps and advanced analytics and performance maps using the N-GAUGE apps.

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Quality monitoring system for homogenisation process

The GEA NiSoMate inline quality monitoring system is a sensor-based technology for product control during the homogenisation process. Liquids are continuously analysed inline for consistency and quality in real time.

The system combines matched sensors that are bundled in a single unit which is installed directly on the homogeniser. With good measurement accuracy, the homogenisation effect on the respective liquids can be displayed in real time without touching the product.

The sensor system uses an ultrasound-based ‘beamforming array’ technology that was specially engineered for this purpose. It allows physical product properties such as density, consistency change and dilution to be derived. These parameters can be read by an external process control which can then take appropriate actions. Consequently, operators can monitor the process directly on the production line and adjust the performance of the system accordingly, without having to wait for laboratory samples results.

The system is designed to help users achieve production goals faster, especially when processing new types of liquids. Preconfigured recipes can also be used and set for a faster process flow once an in situ fingerprint has been analysed for the respective starting product. This makes it suitable for food, new food and pharmaceutical applications.

The GEA NiSoMate can be used in all GEA homogenisers — from laboratory units to large industrial plants — and is also available as a retrofit for existing plants.

GEA Group
www.gea.com

Pump handbook

Alfa Laval has published a new edition of its Pump Handbook. The 375-page handbook contains scholarly information on basic pump functionality and in-depth guidelines for sizing and selecting the right pump type for optimum efficiency. It also includes real-life examples.

The first edition of the Alfa Laval Pump Handbook was published 25 years ago. The book has served as a reference to technicians in the operation of fluid handling processes.

Over the years, the handbook has gone through minor revisions, and in 2023, a major overhaul was undertaken to make the handbook up to date on the most recent technologies.

The authors of the book are all experienced pump engineers with extensive theoretical knowledge and hands-on experience from pump installations and training of technical staff in fluid handling industries.

Available for download from Alfa Laval’s website, the handbook contains a series of videos on, for instance, pump functionality, troubleshooting and maintenance guidelines. The main chapters comprise: Basic theory on pumping applications; Pump types for different applications; Pump sizing for maximum efficiency; Pump specification; Pump motors; Troubleshooting; and Technical data and formulas.

Alfa Laval Pty Ltd
www.alfalaval.com.au
Looking to rice for ‘clean label’ ingredients

Naturally occurring polyphenols and proteins from pigmented waxy rice may help starch ingredients improve texture without any chemical modification, according to Ya-Jane Wang, professor of carbohydrate chemistry at University of Arkansas.

Chemically modified starch is a common thickener in soups and other foods. Without modification, starch breaks down during high-temperature and high-shear food processing and no longer functions properly as a thickening agent.

As consumers express concerns over chemically modified ingredients, Wang is looking at alternatives. With the help of a $400,000 U.S. Department of Agriculture National Institute of Food and Agriculture grant awarded in 2023, Wang is exploring how to use polyphenols and proteins naturally present in pigmented waxy rice as a natural starch strengthener.

Polyphenols are a micronutrient that naturally occur in plants. She used pigmented waxy rice because the presence of polyphenols in the rice and the polyphenol–protein interaction that arises. ‘Waxy’ rice is also known as ‘sticky’ or ‘sweet’ rice due to its low level of amylose, one of the ingredients that make up starch. Higher levels of amylose cause the rice to separate and become fluffy, whereas lower levels of amylose produce higher viscosities. Polyphenol–protein interactions naturally present in the pigmented rice aid in retaining a food’s viscosity, or thickness, during the cooking process.

“We propose that pigmented waxy rice can function like chemically modified starches but without the use of chemicals, so it will be a clean label ingredient,” Wang said.

‘Clean label’ is not a scientific term, but the food industry, academics and consumers define the phenomenon as choosing foods with easy-to-recognise ingredients and no artificial ingredients or synthetic chemicals, according to the Institute of Food Technologists.

Consumer perception

In recent years, consumers have raised concerns about ingredients used in food production, Wang noted. Some consumers aim to consume only minimally processed food.

The idea of minimal processing varies from person to person. Wang said, Some consumers prefer wheat flour, but others might consider wheat flour too processed and consume whole wheat flour instead.

Wang’s research may alleviate consumer concerns related to modified starch.
Many foods contain modified starch, which is chemically altered to improve processing and storage stability, Wang said. Starches function as thickening agents to improve the texture and consistency of food products.

The inspiration for this project came from Wang’s recent research that explored the possibility of using the interactions among polyphenols, protein and starch in pigmented waxy rice to increase satiation, the feeling of fullness. In that original project, Wang found that the pigmented waxy rice’s unique interactions between polyphenols and proteins allow starch to swell more in an acidic condition that simulates gastric environments.

“Starch, when it swells, is like a balloon — it becomes bigger and bigger,” Wang said. During food processing “the temperature, the shear, the high acidity will completely break down the balloon. You want the balloon to swell more — that is how you create the viscosity — but you don’t want it to swell too much. The polyphenol–protein interactions help to maintain the starch structure so it will stay at that stage.

“That is why you can use starch to thicken any soup because the starch can swell more than 10 times its volume, but once it gets to that stage, it becomes very fragile,” she said.

Outside of consumer perception, Wang said that applying this pigmented waxy rice, as opposed to using modified starch, could provide additional environmental and health benefits.

With any chemical modification comes a residue, Wang said, so using a naturally occurring starch with these properties eliminates that concern. Polyphenols are present in many berries and vegetables, and a high amount of polyphenols are known to have antioxidant, anti-inflammatory and antidiabetic properties.

**A three-phase approach**
The research will take place in three phases. Wang and her team have finished the first phase, which evaluated pigmented waxy rice samples and their contents and compositions of proteins, starch and polyphenols. A research article, titled ‘Elucidating the effect of polyphenol-protein interactions on rheological properties of purple waxy rice’, was published in the *Journal of Cereal Science* this month.

The next phase will determine the nature of the polyphenol–protein interactions in pigmented waxy rice. Interactions between polyphenols and proteins involve chemical bonds linking two molecules, and it is important because a strong bond helps maintain granule integrity under high shear, temperature and acidic conditions, Wang said.

Finally, the researchers will apply thermal processing conditions to alter the extent of polyphenol–protein interactions so the resulting products will produce a wide range of viscosities for different applications.

“We really want to see the possibility of commercialising the resulting technology,” Wang said. “We want to see if any companies are interested and work with them.”

Companies using this to make cereals, pudding or pasta is something that Wang hopes to see.

Wang will share an update on this research at the USDA-NIFA project director meeting in Amherst, Massachusetts, on 17–18 June.

To learn more about the University of Arkansas Division of Agriculture research, visit aaes.uada.edu.

*This is a modified version of a news item published by University of Arkansas System Division of Agriculture under CC by SA*
**Food enzyme for instant coffee**

c-LEcta and ANKA have developed Acrylase — a new food enzyme to reduce acrylamide in instant coffee and ready-to-drink coffee beverages. The patented technology is designed to target acrylamide directly and is claimed to provide benefits over existing mitigation measures.

As acrylamide is considered carcinogenic, limitation and mitigation of this process contaminant in food is a priority in regulatory acts worldwide. Typically, acrylamide is formed when starchy food materials are exposed to high heat, such as during roasting and extraction to produce soluble coffee, coffee concentrates as well as cereal- or chicory-based coffee surrogates.

Acrylase is claimed to be the first commercially available enzyme for direct decomposition of acrylamide, enabling on-site control of acrylamide levels during the processing of soluble coffee and coffee extracts. It is a flexible and simple drop-in solution that can be easily integrated into existing manufacturing processes. Thus, Acrylase is designed to help with regulatory compliance without the need for other costly mitigation measures.

In some countries such as South Korea and in the EU, directives and regulations are already in force to mitigate acrylamide and limit consumer exposure, ie, by introducing benchmark levels and monitoring acrylamide levels in various product categories, including soluble coffee. In addition, the introduction of fixed maximum limits is currently under discussion by the European Commission.

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Advances in genetic engineering are allowing scientists to harness microorganisms to produce food that is healthy for consumers and healthier for the environment.

One of the most promising sources of innovative foods is fungi — a diverse kingdom of organisms that naturally produce a range of tasty and nutritious proteins, fats, antioxidants and flavour molecules. Chef-turned-bioengineer Vayu Hill-Maini, an affiliate in the Biosciences Area at Lawrence Berkeley National Laboratory (Berkeley Lab), is exploring the many possibilities for new flavours and textures that can be made from modifying the genes already present in fungi.

“I think it’s a fundamental aspect of synthetic biology that we’re benefiting from organisms that have evolved to be really good at certain things,” said Hill-Maini, who is a postdoctoral researcher at UC Berkeley in the lab of bioengineering expert Jay Keasling.

In their recent paper, published on 14 March in *Nature Communications*, Hill-Maini and colleagues at UC Berkeley, the Joint BioEnergy Institute, and the Novo Nordisk Foundation Center for Biosustainability studied a multicellular fungus called *Aspergillus oryzae*, also known as koji mould, that has been used in East Asia to ferment starches into sake, soy sauce and miso for centuries. First, the team used CRISPR-Cas9 to develop a gene editing system that can make consistent and reproducible changes to the koji mould genome. Once they had established a toolkit of edits, they applied their system to make modifications that elevate the mould as a food source. First, Hill-Maini focused on boosting the mould’s production of heme — an iron-based molecule that is found in many lifeforms but is most abundant in animal tissue, giving meat its colour and distinctive flavour. (A synthetically produced plant-derived heme is used in some alt-meats on the market.) Next, the team punched up production of ergothioneine, an antioxidant only found in fungi that is associated with cardiovascular health benefits.

After these changes, the once-white fungi grew red. With minimal preparation — removing excess water and grinding — the harvested fungi could be shaped into a patty, then fried into a tempting-looking burger.

Hill-Maini’s next objective is to make the fungi even more appealing by tuning the genes that control the mould’s texture. “We think that there’s a lot of room to explore texture by varying the fibre-like morphology of the cells. So, we might be able to program the structure of the lot fibres to be longer which would give a more meat-like experience. And then we can think about boosting lipid composition for mouth feel and further nutrition,” said Hill-Maini, who was a Fellow of the Miller Institute for Basic Research in Science at UC Berkeley during the study.

“I’m really excited about how can we further look at the fungus and, you know, tinker with its structure and metabolism for food.”

Though this work is just at the beginning stage of tapping into fungal genomes to create new foods, it shows the potential of these organisms to serve as easy-to-grow protein sources that can avoid the complex ingredients lists of current meat substitutes and the cost barriers and technical difficulties hindering the launch of cultured meat.

Despite humanity’s long history of domesticating fungi to eat directly or to make staples like miso, multicellular fungi have not yet been harnessed as engineered cellular factories to the same extent because their genomes are far more complex, and have adaptations that make gene editing a challenge. The CRISPR-Cas9 toolkit developed in this paper lays the foundation to easily edit koji mould and its many relatives.

Given his culinary background, Hill-Maini is keen to ensure that the next generation of fungi-based products are not only palatable, but truly desirable to customers, including those with sophisticated tastes.
Chilli product range
The Chilli Factory launched four new chilli products at 2024 The Royal Sydney Easter Show. The gourmet range includes hot and mild chilli oils, chilli honey and chilli chocolate sauce. www.thechillifactory.com

Bite-sized version of chocolate bar
Reminiscent of the original Polly Waffle first created in 1947, the Polly Waffle Bites, released in April 2024 in Australia by family-owned confectionery manufacturer Menz, are bite-sized pieces of soft vanilla marshmallow covered in milk chocolate with crunchy pieces of wafer throughout. Due to manufacturing complexities, Bites will replace the original bar permanently. www.menz.com.au

Don’t call it tequila
Top Shelf International is launching Act of Treason, 100% agave spirit created in a distillery in the Whit-sundays. The farm and distillery is home to more than 600,000 Agave tequilana, the same plant that has been used in the distillation of tequila for centuries. www.actoftreason.com.au

Low in calories, high in taste
UK-based brand Sweet Freedom is introducing an assortment of vegan, versatile and natural syrups sweetened only with fruit (carob and apple) to the Australian market next month. The range is only 54 kJ per teaspoon, including flavours raspberry syrup, honeycomb syrup and pancake syrup. sweetfreedom.co.uk

Home make ice-cream cake
Australian owned and made baking company Green’s has launched a range of frozen cakes. The Ice Dream range is now available in supermarkets with flavours Chocolate Chunk Ice Dream Cake, Strawberry Shortbread Ice Dream Cake and Choc Mint Flavoured Ice Dream. greensbaking.com.au

Chopsticks at the ready for Spiciest Twisties
Twisties has released its newest and spiciest flavour to date – Twisties Spicy Ramen. The limited edition range uses red chilli, ginger and black pepper flavours to deliver the heat for spice-lovers. www.smiths.com.au/brands/twisties
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