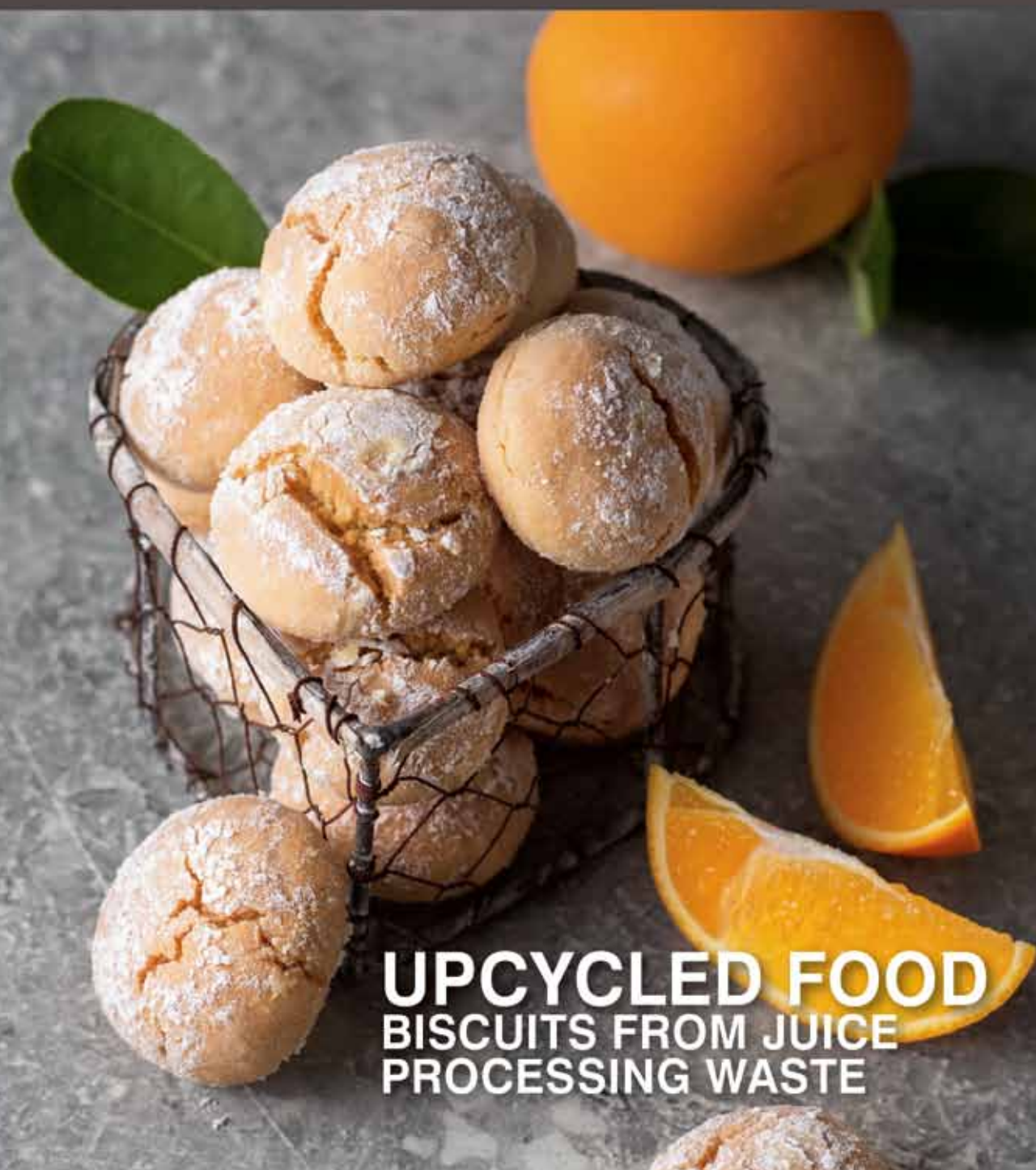


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July/August 2020



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## READ ONLINE!

This issue is available to read and download at [www.foodprocessing.com.au/magazine](http://www.foodprocessing.com.au/magazine)

*A drone monitors rice crops at the Americas Hub of the Alliance of Bioversity International and the International Center for Tropical Agriculture in Colombia.*

# Technologies that could transform our food systems

**R**esearch to date on the future of food systems has largely focused on incremental changes possible with existing technologies. But even that research finds that incremental changes will not be enough, and that food systems will need to be transformed to sustainably cater to an increasing global population.

A study published in *Nature Food*, led by CSIRO and the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS), provides insights into some new technologies that could transform our food systems, ecosystems and human health.

“We have come to a point where business-as-usual is not an option,” said Ana Maria Loboguerrero, a co-author of the study and the Climate Action Research Area Director at the Alliance of Bioversity International and CIAT.

Investigating 75 emerging technologies, the study identifies a range of promising options, many of them ready or near-ready. The shortlist comprises technologies that not only contribute to a host of Sustainable Development Goals — climate action, reducing environmental impact, reducing poverty, healthy food — but can also be tailored to a range of institutional and political contexts. The diverse pipeline spans the entire food value chain, from production and processing to consumption and waste management.

Some of these technologies are familiar, such as artificial meats, 3D printing, drones, ‘intelligent’ materials and vertical agriculture. Others include nitrogen-fixing cereals that don’t need fertiliser, spreadable biodegradable polymers that converse soil moisture and feed for livestock produced from human sewage. The study focuses on the potential benefits of these technologies and acknowledges that there will be trade-offs.

Genetic modification of crops is hotly debated; there is also the risk that unequal access to costly technologies could increase inequality. Transparency will be key to prevent unintended negative social and environmental impacts, with appropriate policies and regulations needed to ensure that benefits are distributed fairly. Building the social trust necessary for the new technologies will be the foundation of change, according to the study’s authors.

“New technologies, especially the more controversial ones, require investment and political support to get off the ground. And for real implementation you need public support. Dialogue is the first step to repairing the trust between science and society — this paper aims to open a space for that dialogue,” said Philip Thornton, CCAFS Flagship Program Leader and a co-author of the study.

The research outlines what is needed to create the essential dialogue, and the enabling environment that will accelerate the much-needed innovation.



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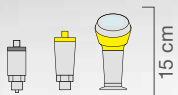


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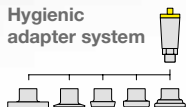
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# Food FOR thought



## \$12,600 fine for undeclared gelatin on yoghurt

Australian-owned supplier of yoghurt products Queensland Yoghurt Company Pty Ltd (QYC) has paid a penalty of \$12,600 after the ACCC issued it with an infringement notice for allegedly misleading consumers by omitting gelatine as an ingredient on the label of some of its yoghurt products.

The ACCC alleges that, from at least 2 July 2019, QYC failed to disclose the presence of gelatine, or the compound ingredient CFT-1 of which gelatine was a component, in its Queensland Yoghurt products, when in fact gelatine was an ingredient.

“Consumers rely on accurate labels to make informed purchasing decisions,” ACCC Commissioner Sarah Court said.

The ACCC had reasonable grounds to believe that by omitting gelatine (or CFT-1) from its ingredient list, QYC’s statement of ingredients was false or misleading, in contravention of the Australian Consumer Law.

The ACCC was also concerned that QYC was not competing fairly in a market where products are differentiated by their ingredients, by being able to offer an apparently more attractive product which was represented to be free from gelatine.

“Misleading representations relating to food are a 2020 enforcement priority area for the ACCC, and we will continue to take enforcement action where necessary,” Court said.

QYC has committed to amend its products’ statement of ingredients by the end of May.

Food manufacturers must comply with the Australian Consumer Law, the Food Standards Code Australia and New Zealand and the relevant state legislation which requires labels to provide accurate information regarding a product’s ingredients.



## Chewing the fat of plant-based meat

Motif Foodworks is working with University of Guelph in Ontario to evaluate novel technologies for formulating lipids and fibre-forming ingredients in plant-based meats and dairy products that could enable taste and texture improvements in these categories.

Food producers have previously relied on existing ingredients such as coconut oil to replicate the sensory experience of animal-derived fats, but current solutions do not taste, cook or interact with other ingredients like animal fats do.

Motif will assess a set of technologies that aim to improve animal-free fats to make plant-based burgers, sausages and cheese more delicious. This includes replacing saturated fat with an animal-free emulsion system that exhibits the physical properties of saturated fat at room temperature and replicating critical animal fat structures, such as the pockets of fat in meat products that produce marbling.

## Nestlé plant-based burger no longer ‘incredible’ in Europe

A European Union court has granted Impossible Foods a preliminary injunction, ordering Swiss food and beverage company Nestlé S.A. to stop using the product name “Incredible Burger”. The District Court of The Hague ruled that the use of Incredible Burger in Europe infringed upon Impossible Foods’ Impossible trademarks, including Impossible Burger, and was likely to confuse customers.

As a result, several Nestlé subsidiaries throughout Europe are prohibited from branding their product Incredible Burger.







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# Food FOR thought



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## Cheesemaker on the Queen's Birthday 2020 Honours List



Image credit: Dean Martin

South Australian cheesemaker Kris Lloyd was named Member of the Order of Australia (AM) in the General Division on the Queen's Birthday 2020 Honours List, for significant service to the

artisan cheesemaking industry, to education and to tourism.

Back in 1999, Lloyd established Woodside Cheese Wrights, which has now won numerous cheese awards throughout Australia, and internationally.

"Establishing an artisan cheesemaking business in Australia has been exciting and rewarding but has not come about without significant patience, persistence and passion," Lloyd said.

"It's hard work and especially in the beginning... some 20 odd years ago now when I stumbled on this

career. There were few books to help you learn, no internet to speak of and certainly no cheesemaking school.

"It is the latter that I was determine to establish, some kind of learning that all the cheesemakers in South Australia could benefit from, after all we were all in the same position. Perhaps my ability to collaborate with industry led to the recognition," she said.

Although Lloyd has received many awards during her career, the AM was completely unexpected. "I am very honoured and humbled to receive such recognition," she said.

"The cheese and food industry is such an incredibly important part of my life, I hope that my recognition will shine a light on all the cheesemakers and food producers across the country, and especially in my home state, South Australia."

## Mr Vegemite featured in new book

*Grave Tales: Melbourne Vol. 1* features the story of food technician Cyril Callister, the man who made Australian foods safer and created Vegemite. The book visits 11 Melbourne cemeteries to tell the stories of ordinary people caught up in extraordinary events that made local and national headlines. Written by journalist Chris Adams and author/journalist Helen Goltz, *Grave Tales* traces the tumultuous journeys that lead to these final resting places.



## Baking surge prompts Darling Downs business expansion

Kialla Pure Foods, a Darling Downs-based organic grain processor, has increased production due to rising demand for baking and cooking ingredients during the COVID-19 pandemic. The company has hired six new people to meet demand for products like flour, as the nation moves to cooking at home. The new hires include a musician whose gigs were cancelled and a miner whose work had dried up; all new employees were redeployed after losing their jobs during COVID-19.

The company was one of 15 businesses in Queensland to receive a co-contribution Rural Economic Development (RED) Grant of up to \$250,000 to improve their business under round one in 2019. The grant was used to upgrade the company's blending system by installing a new mixer and packaging system.



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## foodpro to return in 2021 at Sydney Showground

Following the postpone of foodpro 2020 due to the government legislation on social distancing and travel restrictions, foodpro will now take place from 25 to 28 July 2021 at the Sydney Showground, Sydney Olympic Park. The event aims to provide a platform for the industry to grow, learn and conduct business safely. With limited availability at the Melbourne Convention and Exhibition Centre, organisers have temporarily relocated foodpro 2021 to the Sydney Showground.

For more than 50 years, foodpro has brought together the food manufacturing and processing industry, and it has established a strong community of exhibitors, partners and visitors that are at the forefront of the brand. Foodpro will look to adapt and introduce new opportunities for connection over the coming months, bringing together suppliers and buyers in the industry.

In these unprecedented times, foodpro has seen the industry show strength, resilience and innovation as domestic food manufacturing and processing demands increase and change. The event will return to its scheduled rotation in 2023; in the meantime, foodpro 2021 will provide a platform for attendees to re-establish ties with each other and unite the industry towards a more sustainable world.





# Allergen labelling errors

## Calls for improved packaging practices and stricter rules

**Dr Giovanni Zurzolo, a research fellow in the Allergy and Lung Health Unit at the Melbourne School of Population and Global Health and a Murdoch Children's Research Institute honorary fellow, investigates food labelling and cross-contact issues.**

In an article published in the *Journal of Paediatrics and Child Health*, Dr Zurzolo raised questions about the cause of food recalls and how potential allergens should be approached.

Using Food Standards Australia New Zealand (FSANZ) data from 2018, he said incorrect labelling caused most food recalls from 2016–2018. Until then, it had been assumed that cross-contact, where something went wrong in the supply chain, such as nut traces finding their way into chocolate, was the main cause.

“Our current results suggest that in Australia, packaging errors are a leading cause of food recalls due to presence of undeclared food allergens, not allergen cross-contact,” Dr Zurzolo said.

“This finding may also explain the relatively high prevalence of consumer reported anaphylaxis to processed food, as we have previously reported.”

Dr Zurzolo said from 2009–2018, FSANZ conducted 675 food recalls. Undeclared allergens (39%); microbial contamination, such as yeast or bacteria (26%); and foreign matter (16%) accounted for most recalls.

In mid-2016, FSANZ added another question to determine the cause of undeclared allergen recalls. It wanted to find out why the prevalence of recalls due to undeclared allergens was so high. It found that for 2016–2018, packaging errors where the food product was either packed into incorrect packaging or was incorrectly labelled accounted for 56% of these recalls, supplier verification issues 16% and cross-contact 10%.

Dr Zurzolo, whose work is funded by the Centre for Food and Allergy Research, said this demonstrates a strong need for better packaging procedures. “There is a need for improved packaging practices to minimise foods with undeclared allergens and increase food safety for food allergic consumers,” Dr Zurzolo said.

Ingredient labels are regulated in Australia, but precautionary labelling is optional. Dr Zurzolo said the data covered reported incidents, so the actual incidence could be higher. He said this meant some consumers faced unnecessary risks. Allergen statements could also be confusing.

“We have called upon industry and governments to have one risk-assessment process that all manufacturers must adhere to,” Dr Zurzolo said. “That would help reduce the chances of these adverse reactions.”

Dr Zurzolo said the prevalence of incorrect labelling could be contributing to allergy problems. “Hopefully, this identification will help industry to reduce the problem,” he said. “Authorities should mandate one risk assessment process as currently we are unsure of what process is being used by the majority of manufacturers. And government auditing of manufacturers should be more prevalent.”

The call follows a bipartisan federal parliamentary inquiry accepting all recommendations by the Centre for Food and Allergy Research, hosted at Murdoch Children's Research Institute in June 2020, to help prevent, cure and manage food allergies.

## CASE STUDY

### Pumping issue solved for bakery ingredients manufacturer



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Sonneveld, a manufacturer of bakery ingredients in The Netherlands, has turned to Certa Sine pump technology from Watson-Marlow Fluid Technology Group (WMFTG) to solve its pumping issue.

One of the company's bakery ingredients is a tomato-based, ready-made marinade called Sonextra Pomodori. The ingredient is used to reprocess stale bread into a savoury snack (or bread chip). When transferring the viscous marinade with the previously used lobe pump, the company encountered problems such as damage to product integrity and blockages.

"Some of our Sonextra marinades contain fresh herbs and have a greasy-type consistency based on natural fats, which proved challenging for our lobe pump. The lobe pump often crushed the fresh herbs excessively and would regularly block, resulting in a suboptimal product and significant downtime," said John de Vos, Maintenance Engineer at Sonneveld.

Sonneveld required the pump to transfer marinade between IBC containers and 5 L steel canisters.

"Each time the lobe pump blocked we lost a lot of production as, in order to get it running again, we had to take it apart, which was difficult and time-consuming. This meant that both the quality of the end product and downtime due to maintenance were not at the expected levels."

The Certa Sine pumps, which are suitable for use with viscous products, were trialled as a solution to their pumps issue at the facility.

"We are always very cautious about implementing changes to our production processes, but the pump's features were of great interest, and it seemed a very good match for some of our products," de Vos said.

After favourable trials, Sonneveld decided to replace its lobe pump with the Certa pump for its Sonextra marinades. The pump has been operational for three years, pumping product with

viscosity up to 8000 cP (containing particulates up to 7 mm in size) at rates of up to 5000 L/h (at 4 bar). The pumps' success led to Sonneveld installing six pumps onsite, with a seventh on order.

"Right from the start the pump excelled on almost all levels. Most important was the impact on product quality. Using the Certa pump significantly improved the quality of the end product as the fresh herbs were pumped gently throughout the process. This resulted in a much more aesthetically pleasing product compared with using the lobe pump," de Vos said.

Maintenance at food manufacturers is vital for many reasons, especially hygiene. The smooth internal surface of the Certa pumps prevents product remaining inside, keeping them clean. "If we want to use the pump for another product, a simple CIP cleaning routine suffices. We rinse the pump with hot water and drain it, then we can start right away with the next product," de Vos said.

Product specialist Georges Paans is also very satisfied with the Sine pump technology: "With this pump the fresh herbs in our marinades remain intact and the pump does not get blocked. The pump also transfers less heat into the production process, which means less crystallisation of the marinade, thus improving its consistency."

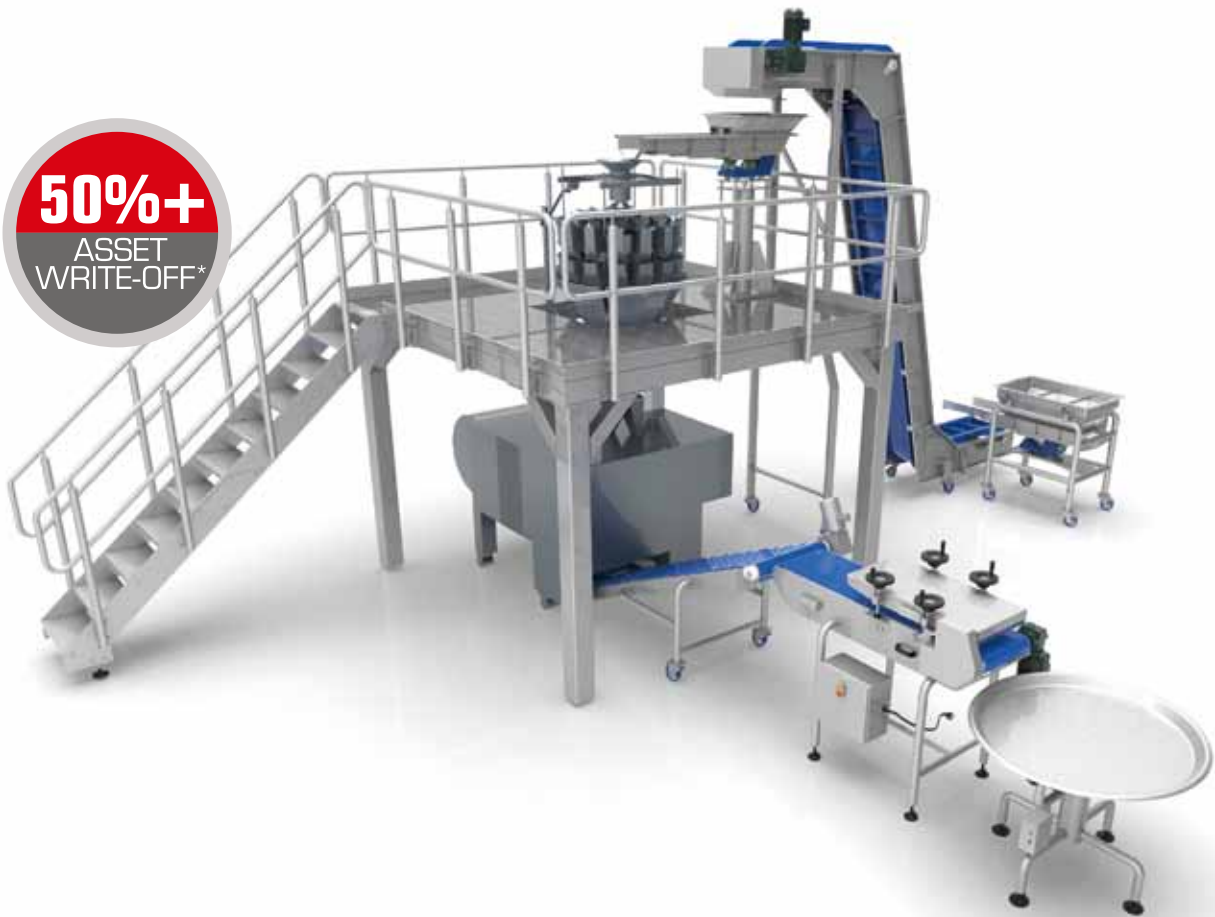
Although pump quality was a key factor in Sonneveld's decision to use Watson-Marlow pumps, the level of service and commitment was deemed equally important. This combination has led the company to install a number of additional Certa Sine pumps.

"The Certa pumps are perfect for us, especially when pumping fats and releasing agents, and the excellent customer service has been an important factor in our decision to continue using Watson-Marlow," de Vos concluded.

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## Dual-action coating designed to prevent produce contamination

Researchers at Texas A&M University have created a coating that can be applied to food-contact surfaces like conveyor belts, rollers and collection buckets, to prevent contamination by microorganisms. In addition to being germicidal, the coating is designed to be extremely water-repellent. Researchers believe that without water, bacteria cannot stick or multiply on surfaces, thereby curbing contamination from one piece of produce to another. Results from the study were published in the February issue of the journal *ACS Applied Materials & Interfaces*.

“In our study, we show that our new dual-function coating — one that can both repel and kill bacteria — can greatly mitigate bacterial spread, averting cross-contamination,” said Mustafa Akbulut, associate professor in the Artie McFerrin Department of Chemical Engineering.

Foodborne illness can be caused by a range of pathogens that include multiple strains of viruses and bacteria. To remedy any infection after harvest, fresh produce may be washed then sterilised in antimicrobials. However, bacteria can still hide in hard-to-reach places on the skins of fruits and vegetables. If the bacteria is large enough, it can also form protective sheaths, called biofilms, that further protect them from the action of sanitisers.

Contaminated produce items can spread the pathogens directly, by touching other food items, or indirectly, via food-contact surfaces. There are several ways to prevent indirect transmission, ranging from antimicrobial surface coatings to antifouling polymer surfaces that act like springs to push bacteria away. However, researchers believe these approaches, while efficient at first, can lose their effects over time for a variety of reasons.

The researchers therefore created an antimicrobial surface coating that was hydrophobic, which is designed to help the food-contact surface retain its germicidal action much longer.

“Most bacteria can only survive in an aqueous environment. If surfaces are super-hydrophobic, then water, and along with

it most of the bacteria, will be repelled away. With fewer bacteria around, less germicides are used up, increasing the overall lifetime of the coating,” Akbulut said.

To make the dual-function coating, researchers started with an aluminium sheet, a metal commonly used in the food industry for contact surfaces. Onto the surface of the metal, researchers chemically attached a thin layer of silica using high heat. With this layer as a substrate, researchers then added a mixture of silica and a naturally occurring germicidal protein found in tears and egg white called lysozyme.

Together, the silica-aluminium layer bound to the silica-lysozyme layer made a coating that had a rough texture when viewed at microscopic scales. The researchers noted that this submicroscopic roughness, or the tiny bumps and crevices on the coating, is key to superhydrophobicity.

When the superhydrophobic, lysozyme-infused coating was ready, the researchers tested if it was effective at curbing the growth of two strains of disease-causing bacteria — *Salmonella typhimurium* and *Listeria innocua*. Researchers discovered that the number of bacteria on these surfaces was 99.99% less than that on bare surfaces.

Despite the high efficacy of the coating in preventing bacterial spread, researchers said that more investigation is needed to determine if the coating works equally well for mitigating viral cross-contamination. Although longer lasting than other coatings, researchers noted that their coating would need to be reapplied after a certain amount of use. As a next step, the researchers are working on developing more permanent, dual-functionality coating.

“Our goal is to create smart surfaces that can avert any kind of pathogen from attaching and multiplying. In this regard, we have developed surface coatings that can prevent bacteria from collecting on surfaces, which is one of the major reasons for cross-contamination. We are now working with researchers in agriculture to take our invention from bench to practice,” Akbulut said.

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# RACK ARMOUR PROTECTS

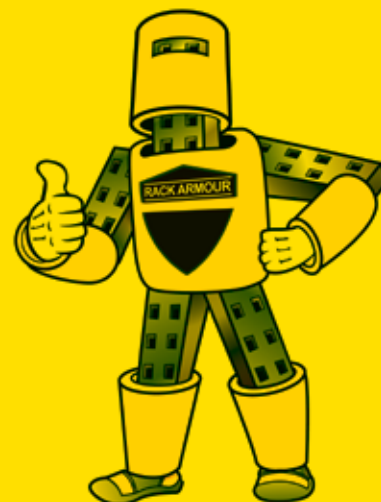


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# Robotic milking system implemented in WA dairy

Innovative dairy farmers Mat and Sue Daubney — co-owners of Bannister Downs Dairy Farm — pride themselves on delivering quality farm-fresh products, such as milk, cream and flavoured milks. Located in Northcliffe (which is in the lower South West region of Western Australia), the farm has built a creamery on a greenfield site and this is where they now milk, process and dispatch all their products. For their raw milk collection, they have implemented the DeLaval automatic milking rotary (AMR) technology, complete with a Kaeser compressed air system.

Almost 10 years ago, DeLaval created the automatic milking rotary (AMR) to meet the requirements of large dairy farmers wanting an automated milking system. The system enables up to 1600 fully automatic milkings per day and relies on an efficient and clean supply of high-quality compressed air, which in many cases is now supplied by a Kaeser compressed air system.

The AMR at Bannister Downs Dairy Farm operates 24 hours a day and is responsible for milking part of the 2000 Holstein Fresian dairy herd. Once the on-farm milking process is complete, the milk is transported just 10 m through stainless steel pipework into the processing facility, where it is processed and packaged ready for daily dispatch.

For Mat Daubney, having a reliable compressed air system is critical for the dairy to be able to produce and deliver fresh products to its customers on a daily basis. He said: “The concept of robotic milking is still relatively new and the AMR at Bannister Downs is the first one DeLaval has built of its generation in Australia. We are relatively isolated — both being in Australia and our actual dairy location — which is even more reason why we need the AMR and the Kaeser compressed air system to be reliable.”

Reliability and efficiency are just two reasons why DeLaval in Australia and New Zealand are choosing Kaeser when it comes to delivering high quality and clean compressed air to its automated milking rotary.





### How does the system work?

Once the cows are collected in a waiting area, a crowd gate may be used to slowly and calmly move the cows into the AMR platform. Preparation, milking and the exit stages of the milking process are then carried out by five robotic arms. Two arms manage preparation, two milking and one more manages the teat spraying at exit.

In the preparation stage, a cup is attached to the teat where a unique combination of air and water clean, stimulate and strip the teat ready for milking. The next robotic arm then attaches the separate milking cups, which commences the milking process. Once complete the first step in the exit process is delivered by the last of the five robotic arms. Finally, before the cow exits the AMR, each teat is sprayed individually using a separate line and nozzle to eliminate any risk of milk contamination.

To deliver a reliable supply of clean, dry and high-quality compressed air to the AMR, two Kaeser SX 3 T series rotary screw compressors with integrated refrigeration dryers, complete with air treatment package and air receiver, were installed.

The SX series from Kaeser are small but mighty compressors that not only deliver more compressed air for less energy but also combine ease of use and maintenance.

At the heart of the SX series rotary screw compressor lies the Sigma Profile screw compressor block. Operating at low speed, the Kaeser screw compressor block is equipped with flow-optimised rotors for good efficiency. Furthermore, all SX series rotary screw compressors feature energy-saving, premium efficiency IE3 drive motors, which comply with and exceed prevailing Australian GEMS regulations for three-phase electric motors. For Bannister Downs Dairy Farm this means more compressed air for less energy consumption.

The compact SX T models also include an integrated refrigeration dryer which is installed in a separate enclosure. An automatic dryer shutdown feature further aids energy-efficient performance. In addition, a service-friendly design ensures that all maintenance and service components are easily accessible. This significantly reduces the downtime associated with such tasks and helps to increase compressed air availability and minimise operating costs.

To meet the air purity level required for food manufacture, Kaeser filters were also installed as part of the air treatment package. Thanks to lowest-possible differential pressure, these filters efficiently ensure compressed air of all purity classes as per the ISO 8573-1 standard. Using modern deep-pleated filter media, they remove particles and aerosols, while a highly effective carbon fibre mat traps oil vapours. Together with innovative flow dynamics, they deliver good filtration efficiency with minimal pressure loss.

12 months on from installation, Mat is pleased to report that the Kaeser compressed air system has been running without incident. "With a site that's got quite a lot of new technology in it, that's pretty good and something we're really happy about," he said.

The SX series of rotary screw compressors from Kaeser is available with working pressures 7.5 to 15 bar, motor power 2.2 to 5.5 kW and free air deliveries 0.26 to 0.80 m<sup>3</sup>/min.

Kaeser Compressors Australia  
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## Radar level transmitter

Krohne, a manufacturer and supplier of solutions in industrial process instrumentation, has released the Optiwave 6500C, a radar level transmitter for powders and dusty atmospheres. The Optiwave 6500C provides continuous high measurement in silos, hoppers and containers. The radar level transmitter can be used for bulk storage in a range of industries, such as the mining, minerals, chemicals, power, paper, food and beverage industries.

The radar offers several advanced technological features, including an 80 GHz (FMCW) bandwidth radar and a 70 mm lens antenna, making it suitable for environments with low-reflective media. With a measuring range extending over 100 m, the Optiwave 6500C is also suitable for uneven surfaces or tanks with obstacles.

The radar also features PEEK Lens antennas with both concave and convex lenses for distances up to 100 m, and a large backlit LCD screen with a 4-button keypad, providing flexibility for different radar usage. The Optiwave 6500C comes with a three-year warranty and is suitable for both animal food production and cereal storage.

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## Stainless steel air-operated conveyor

Exair's Type 303 Stainless Steel 2-1/2 NPT threaded line vac air-operated conveyors convert ordinary pipe into a conveying system for parts, scrap, trim and other bulk materials. They are suitable for food, chemical, pharmaceutical and medical processes, or areas that are wet and corrosive. The 303 stainless steel provides chemical and corrosion resistance, performance in high temperatures, long service life and low maintenance.

The unit's large size makes them suitable for conveying bigger parts and larger volumes of material over long distances. The Threaded Line Vac can be attached to standard plumbing pipe couplers, enabling users to build a complete pipe system using common pipe and fittings. The conveyors eject compressed air to produce a vacuum on one end, with high output flows on the other. Regulating the compressed air pressure provides control of the conveying rate. Applications include scrap trim removal, material conveying, part transfer, fibre tensioning and filling operations.

The Threaded Line Vacs are CE compliant and meet OSHA pressure requirements, with a size range from 3/8 NPT to 3 NPT. Models are also available in type 316 stainless steel, for even more demanding high-temperature, corrosive and hygienic environments.

Available from Compressed Air Australia, the Exair air-operated conveyor models include light-duty, standard, threaded, heavy-duty and sanitary flange styles.

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## Electromagnetic drive range

Enmin's electromagnetic vibratory feeders offer a handling method suitable for controlling the flow of product, parts and bulk materials. Products can be screened, sized or metered to provide a smooth, uniform and fully variable flow.

Enmin's EMA drives use the power of electromagnetic energy to generate a vibratory force to the conveying tray of the vibratory feeder, providing stability, control and precision in the delivery of product to a secondary process. The cyclic operation is controlled by a range of electronic controllers that vary the feeding rate in a manner to suit the specific application.

The company's range of models and tray configurations can convey a variety of different-sized products and ingredients, and are suitable for basic to complex applications. The drives are designed to provide years of operation with minimal moving parts, with limited maintenance and low energy consumption. The drives are constructed to meet the requirements of the food and pharmaceutical industries, such as maximum hygiene, ease of cleaning and continuous operation.

The drives maintain constant flow into elevating and belt conveyors, multi-head weigh scales, filling and seasoning applications. The conveying-by-vibration method provides smooth product transfer without degradation. Alongside the food industry, the drives are suitable for any industry that handles dry bulk material, processed products or parts.

Enmin's product range is designed and manufactured in Australia, enabling individual design and customisation, local advice and consistency of supply.

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### Contour machine guarding

The Axelent X-Guard Contour machine guarding is easily configurable and designed to adapt to a user's machine guarding requirements at a warehouse, factory or facility. With 90-degree corner angles, it can provide round corners on the guarding, making it suitable for confined areas within a production environment or a narrow warehouse.

The X-Guard range is designed to ensure that the guarding fits easily and quickly around all types of machines and safety areas. A range of combinations is available to provide flexibility, and the guards are available in mesh panel, sheet plate and plastics sections.

With X-Guard's smart door solutions, users don't need to predetermine whether a left- or right-hinged door is required. The sections are available in 13 widths and four heights and are quick to assemble.

An X-Key is also available that allows users to change the hinge and lock with a simple operation, which ensures that users can reconfigure panels as requirements change.

**Axelent Automation & Safety PTY LTD**

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

### Tracking system for multi-product packaging

Food and beverage manufacturers are constantly under pressure to package a wider variety of products in more types of packaging without compromising productivity. Now, the iTRAK 5730 small-frame intelligent track system from Rockwell Automation can improve throughput in multi-product food and beverage packaging applications. The system uses independent cart technology to support smart, flexible and efficient machines.

Independent cart technology offers many benefits over traditional gear, chain and belt conveyors, including unlimited machine flexibility, better traceability and increased uptime. By using magnetic propulsion, the individually controlled carts can quickly start and stop with high precision, which reduces machine wear and is energy efficient. The technology also quickly manages changeovers using preconfigured move profiles that can be implemented with the push of a button from an HMI.

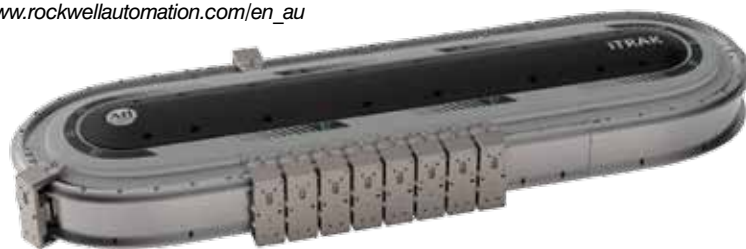
The system has the smallest footprint within Rockwell Automation's independent cart portfolio. It has a 50 mm minimum pitch that makes it suitable for primary packaging applications, such as flow wrapping, end load cartoning and form-fill-and-seal pouching. The system also easily integrates into a manufacturer's architecture, providing analytics that help optimise energy use, monitor parts wear and reduce downtime.

In addition to delivering a smarter form of motion control, the iTRAK 5730 also offers integrated safety. Features such as safe torque off, Safe Stop 1, a SIL 3, PLe safety rating and the ability to create safety zones help increase confidence in machine safety. Safety zones, for example, can increase safety without compromising productivity by allowing motion to continue outside of the safety zone, even after a trip inside the safety zone.

Furthermore, simulation capabilities allow users to calculate throughput on the system. Users can also create a digital twin that can be used to virtually design, commission and demonstrate the system, and to virtually train workers. Standardised object-oriented libraries also can help create a consistent user experience and accelerate time to market.

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## CASE STUDY

### AGVs help drive Arnott's biscuits



Arnott's has introduced six automatic guided vehicles (AGVs) from Dematic to its head manufacturing plant in Brisbane, Queensland. The self-charging AGVs are designed to increase efficiency, accuracy and safety in manufacturing and distribution centres, using precision laser guidance and multiple collision avoidance sensors.

Tim Morgan, Arnott's Group Plant Manager for Qld and SA, said the company partnered with Dematic to find a solution that enhanced the efficiency of its manufacturing operations.

"The implementation of AGVs in our manufacturing has helped us to achieve automated movement of product loads to improve reliability, increase flexibility and provide better sanitation for handling goods. This means we can focus on delivering our products to Australians in the best way we can," said Morgan.

The AGVs work systematically to carry large pallets of product from end-of-palletising stations to drive-in

storage racking areas. From there, the AGVs take the pallets to handover stations where forklifts transport them to manufacturing lines.

"We are very pleased to be working alongside such a well-known and respected Australian brand as Arnott's," said Tony Raggio, General Manager for AGVs at Dematic.

Using the AGVs has increased reliability, as they are capable of working 24/7 every day of the year. The AGVs also improve the accuracy of operations, thereby minimising mistakes and workplace accidents and improving occupational health and safety standards.

"Our AGV automated technology is a very exciting product for us here at Dematic, and it's fantastic to see it making such successful improvements to Arnott's warehouse processes," said Raggio.

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## Electromagnetic hopper feeder range

When the accurate delivery of product is required or a controlled method of introducing a secondary product onto a production line, Enmin electromagnetic vibratory hopper feeders are designed to provide a reliable solution.

The robust, yet compact units hold bulk dry food products and ingredients and consistently deliver the product at a metered rate. The hopper has a manual gate on the front that controls the product bed depth, and the controller speed adjustment provides very specific product rate accuracy.

The hopper feeder is suitable for a variety of food production facility needs. Designed for mobility and to take up minimal floor space, it can be used as a standalone unit or as part of an integrated-modular turnkey system. The hopper feeder helps reduce manual handling and food wastage by hygienically storing and accurately delivering product to a secondary process.

Designed and built in Australia, Enmin's Electromagnetic Hopper Feeder range can be customised to meet customer specifications, require minimal maintenance and are built to withstand the demands of food production and handling. The units are fully constructed with 304 stainless steel, providing good durability and reliability.

Enmin recently custom-designed and built a unit for one of Australia's leading contract manufacturing and packing companies. The company required a unit to accommodate two-position dosing of dry ingredients into a cup filling line using twin vibratory feeders.

One of the requirements was to enable production line staff to access the hopper easily and safely. To facilitate this, Enmin designed a mobile unit with retractable operator steps. When not required these steps can be folded out of the way quickly and with very little effort thanks to pressurised struts on each side.

Another feature of this unit is that the controls are integrated within the existing master control system for simple line integration. The unit features Enmin's LD3 electromagnetic drive in conjunction with a multi-function controller that tunes to accurate frequency bands, enabling high-speed filling coupled with accuracy.

All of Enmin's electromagnetic drives offer low maintenance combined with minimal power consumption.

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## Packaging with creases: imperfection with intention

A label with creases — a no-no, but at the Mozart Distillerie in Austria this imperfectionism is quite intentional. The shiny paper foil wrapped around the spherical chocolate liqueur bottles quite deliberately evokes the impression that it has been applied by hand.

In the past few years, output at the Salzburg-based company has more than doubled, producing over 650,000 L of Mozart Chocolate Liqueur in 2019.

Each of the five different chocolate liqueurs are traditionally produced by hand and bottled automatically. But according to Friedrich Guggenberger, Plant Manager of the Mozart Distillerie, the 30-year-old, custom-built bottling machine was struggling to keep up with the increased production demand, and it was hard to find an alternative solution that met their unique requirements.

“Since we wrap our spherical bottles in full-coverage paper foil, we always create creases. And whereas every manufacturer of labellers tries to prevent this, we actually want them, because they give the impression that the containers involved have been labelled by hand,” Guggenberger explained.

“The foil has to fit snugly round the bottle’s body, but in the vicinity of the neck and the base it has to be folded in such a way that it does not twist and subsequently disappears reliably underneath the capsule closure.”

But that’s not all: the machine was also required to incorporate monitoring systems that inspect the labels and the foil for correct placement and for integrity as well. What’s more, the bottles must not turn on the downstream conveyor, so that they enter the capsule closer in the correct orientation.

Krones accepted the challenge — and combined the long years of practical experience and visions of Guggenberger and his team with the technical expertise of its own labelling specialists.

### The creasing solution

After being filled, the bottles enter the labeller through a double worm. An optical monitoring system then centres them so that the sloping area for the label is facing outward.

Thereupon the aluminium-coated paper foil is affixed. To make sure it does not slip, first of all, a dot of hotmelt is sprayed onto the bottle and then the fully glued foil blanks are wrapped around it. For this purpose, Krones is deploying a combination of one cold-glue and one wraparound Controll labelling station.

“ In order to secure the paper foil on the container, Krones developed a patented combination of a servomotor, which turns the bottles, and linear motors, which use sponges to carefully press the foil onto the containers.

”

The next station uses a sponge to press the foil against the sloping area in such a way that afterwards the pressure-sensitive body labels can be applied to the creaseless front of the containers.

This is followed by an operation that basically every labeler manufacturer tries to prevent: creasing. For this purpose, Krones developed a patented combination of a servomotor, which turns the bottles, and linear motors, which in 12 press-on operations use sponges to carefully press the foil onto the containers.

To enable the foil to be dependably secured at the edge of the base as well, Mozart was already using a small bottle plate in the old line, which raises the containers merely by a recess in the base. This means the edges of the bases remain free and the sponges can fit the foil around the edge. In the discharge, a transfer starwheel then lifts the bottles carefully onto the conveyor. Meanwhile, a Checkmat inspector monitors the base label already applied downstream of the filler for correct position and orientation.

The position of the closure cap then applied is also precisely defined. In order to prevent the bottles turning as they travel, Krones has developed a guide rail that transports the bottles with the aid of the sloping label area as an orientation reference point. These rails can be re-adjusted with only a few manipulations, so that all six sizes — from the small 50 mL to the large 1 L bottle — can be handled with the same system.

“I know that we had very many requirements for this labeler — but Krones met all of them. And the result is highly impressive; no other manufacturer could have managed it,” Guggenberger said.



The new line is currently dressing around 5000 bottles per hour, with an option for increasing the output to as much as 9000 bph. And although the labeller now operates fully automatically in line with the very latest state of the art, to the outsider's eye Mozart continues to embody its craft operation. Because no one crease resembles another — and the labeller handling the containers is just as unique as every single container it dresses.

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## Decentralised energy cabinet

PULS ZeroCabinet Series of Power supplies provides decentralised energy in an efficient and modular system structure, to enable easy expansion, replacement or complete dismantlement. It is available in the Basic or eFused series.



The Basic series features one DC output in 300 or 500 W of power. Both series offer protection against dust and water, with IP54, IP65 and IP67 ratings for 1- or 3-phase systems and machines.

The eFused series features up to four current-limited outputs for easy selective power distribution, protection and monitoring directly in the field via the LED interface, and is an alternative to power supply units with an external, electronic protection model.

The series can be operated in ambient temperatures ranging from -25 to +55°C without any loss of performance. Linear derating increases operating temperatures of up to +70°C.

ZeroCabinet is an alternative to a power supply in the centralised control cabinet, decentralised on-site control box or a customer-specific solution. It is suitable for modular applications in the field of conveyor systems, storage technology, robotics, control/regulation technology and material handling.

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## Subcritical compressor range

The new generation of subcritical compressors GEA Bock HGX44e CO<sub>2</sub> for the natural refrigerant carbon dioxide (R744) is suitable for industrial low-temperature applications in cold stores, and in the food industry. The main advantage for users is a minimum 6% higher CO<sub>2</sub> compressor efficiency, compared to customary compressors on the market. The series is designed to reduce operating and energy costs through improved process efficiency, while expanding the range of applications and uses.

Alongside providing higher compressor efficiency, the series has four model variants and features extended operating conditions, such as optimised hot gas defrosting and an extended frequency and temperature range with evaporating temperatures from -50 to -15°C and condensing temperatures up to +15°C.

The compressors also feature an adapted maximum permissible operating pressure (LP/HP 30/55 bar) and a good performance spectrum with swept volumes from 27.7 to 49.2 m<sup>3</sup>/h (50 Hz), and corresponding refrigerating capacity from 51 to 90 kW.

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# Winners of the 2020 PIDA packaging awards announced virtually

The Australian Institute of Packaging (AIP) formally announced the winners of the 2020 Australasian Packaging Innovation & Design (PIDA) Awards 'virtually' with over 380 people registered for the two days from 6–7 May. The PIDA Awards are an Australia and New Zealand program that is coordinated by the AIP, in conjunction with Packaging New Zealand. All 2020 PIDA winners will be automatically eligible for entry into the 2021 WorldStar Packaging Awards competition.

Food and beverage winners included the following:

## 2020 Packaging Innovation & Design of the Year Award – Food Category

The winner of the Gold award for the 2020 Packaging Innovation & Design of the Year – Food Category is Planet Protector Packaging for the Lobster Protector.

The Lobster Protector is a flat-packed, recyclable, biodegradable, renewable and compostable solution made from 100% food safe materials. The design consists of three key components: a wool liner, a fibreboard insert and a corrugated carton with a water resistant coating. The packaging is 100% certified food safe and is 100% recyclable and biodegradable.

The winner of the Silver award was a tie between Disruptive Packaging for Uniqcor for cold chain environments and Platypus Print Packaging for the Youfoodz Meal Kit. A Special Commendation was awarded to Primo Foods for the Red Range Slice Pack.



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## 2020 Packaging Innovation & Design of the Year Award – Beverage Category

The winner of the Gold award for the 2020 Packaging Innovation & Design of the Year – Beverage Category was a tie between Coca-Cola Amatil and Ecolean.

### **Coca-Cola Amatil for its 100% recyclable rPET bottles**

Coca-Cola Amatil has converted all of its single-serve PET bottles from largely petroleum-based PET resin to 100% post-consumer recycled PET resin (rPET). By converting all of these SKUs to 100% rPET, seven out of every 10 bottles CCA sells in Australia are made from recycled post-consumer resin. This equates to over 55% of CCA's total PET tonnages.





**Ecolean for the Bannister Downs Dairy WA chilled pasteurised range**

This lightweight flexible packaging designed for liquid food

products is designed to reduce its impact on the environment with convenience, and innovative and eye-catching packaging. Designed for chilled pasteurised beverages, the packaging performs well in refrigerated and frozen requirements. The material is non-penetrable by UV light and maintains the product's 'coolness' due to the pouch's natural composition. When kept at or below 4°C, the package is designed to keep milk fresh longer and not leak when laid down on a fridge shelf. It can also be frozen when sealed and microwaved safely once the seal is broken.

The winner of the Silver award is Brownes Dairy for Australia's first renewable gable top milk carton.

**2020 Accessible Packaging Design Special Award**

The winner of the Gold Award for the 2020 Accessible Packaging Design Special Category is Ecolean for the Bannister Downs Dairy WA chilled pasteurised range

Ecolean worked with Bannister Downs Dairy to design innovative and lightweight beverage packaging that is certified as easy to open and easy to use by people with reduced hand function.

The Bannister Downs Dairy range has been designed with obvious opening points and the packaging is intuitive to use and open. As the design is shaped like a standard jug, a format well known for containing and pouring liquids, it is intuitive with the 'tear off' instructions near the tip of the pack to open the package. The opening tear operates as indicated along the dotted line. The tear-off spout makes the packages easy to open and empty with no need for the use of tools.

The design is also easy to grip, control and manoeuvre with the 'Firm' grip air-filled handle offering stability to hold the package regardless of whether the person is left- or right-handed. Ecolean has considered the sustainable packaging design principles and chosen a lightweight flexible package, and the packaging is accepted through the REDcycle recycling program.



**2020 Sustainable Packaging Design Special Award – Retail Pack**

The winner of the Gold Award for the 2020 Sustainable Packaging Design of the Year category – Retail Pack is Coca-Cola Amatil for the 100% recyclable post-consumer recycled rPET bottles.

**2020 Sustainable Packaging Design Special Award – Product Protection**

The winner of the Gold Award for the 2020 Sustainable Packaging Design of the Year - Product Protection category was a tie between Opal Packaging Australia (Formerly ORORA Fibre Packaging) for the recyclable moulded paper inserts and Sealed Air Brand Protective Packaging for the TempGuard kerbside recyclable packaging for pre-packaged, temperature sensitive goods.

**Opal Packaging Australia (Formerly ORORA Fibre Packaging) for the recyclable moulded paper inserts**

The Opal Packaging Australia (Formerly ORORA Fibre Packaging) inserts provide protection and presentation for fresh produce inside the carton and offer a recyclable alternative to standard, non-recyclable PVC



plastic inserts. The recyclable moulded paper inserts are made from responsibly sourced fibre and can be customised with specific colours and branding for a range of products. The individually moulded trays provide shock and vibration protection (no ringing on fruit) and offer ventilation and moisture control characteristics to ensure fresh produce integrity.

**Sealed Air Brand Protective Packaging for the TempGuard kerbside recyclable packaging for pre-packaged, temperature sensitive goods**

Sealed Air's TempGuard is a kerbside recyclable and ARL-compliant paper pouch liner made from virgin Kraft paper and is filled with 100% recycled paper. It is used to line cartons that are used for distribution to deliver thermal insulation for chilled items including chilled meals, pharmaceuticals and chocolate. TempGuard is fully recyclable through PREP with on-pack communication providing clear information to consumers about what to do with the product at the end of life.



**2020 Young Packaging Professional of the Year Award**

The winner of the 2020 Young Packaging Professional of the Year Award is Kelly Wade, Scientist, Scion in New Zealand.

Wade is responsible for managing and operating Scion's WHITE room — a facility designed to replicate the effects of humidity and temperature on boxes under stress in the chilled distribution chain. Knowing the conditions under which packaging is likely to fail allows manufacturers of packaging materials and packaging to design materials fit for purpose. He is working with leading global box companies and exporters to make sure their products reach the market in perfect condition.



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## Certified packaging professional designation raises the bar globally for packaging technologists

*Nerida Kelton, MAIP, Executive Director – Australian Institute of Packaging (AIP);  
ANZ Board Member – World Packaging Organisation (WPO)*

As the peak professional body for packaging education and training in Australasia, it is paramount that the Australian Institute of Packaging (AIP) offers professional designations that are internationally recognised and have the ability to raise the profession of packaging technologists and designers across the globe. Such a designation is the Certified Packaging Professional (CPP), which is a registered trademark of the Institute of Packaging Professionals (IoPP) in the United States.

The designation 'Certified Packaging Professional (CPP)' is recognised as the premier designation in the industry signifying excellence as a packaging professional.

Attaining the CPP recognises the designation as a commitment to excellence in the packaging profession and the credential demonstrates that a packaging practitioner possesses packaging knowledge, experience and skills to the degree that they deserve recognition as a true packaging professional. CPPs are in demand as speakers and as leaders on packaging teams.

Recognising the importance of the CPP designation, the AIP approached the IoPP to become the first association globally to roll out the program outside of the US. The Australasian region now has over 25 Certified Packaging Professionals, with enrolments coming in every week from across Australia, New Zealand and Asia. All AIP educational and training activities now attain CPD points towards the CPP Designation, which allows active members the opportunity to accrue points simply by learning, networking and attending packaging-related educational programs.

Through the guidance of the AIP, this model has been replicated through the World Packaging Organisation (WPO) and all WPO Member Associations are being encouraged to offer the CPP program in their country to not only elevate the profession globally but to also ensure that packaging technologists and designers are recognised for their skills and expertise. There are currently 23 countries across the



globe that have qualified Certified Packaging Professionals and this number is growing every day.

WPO Member Associations currently rolling out the program include the Institute of Packaging, Nigeria, the Brazilian Packaging Association, the Institute of Packaging in South Africa and the Spanish Packaging Association. The CPP designation is now inter-

nationally recognised by the IoPP, the AIP and the WPO.

By encouraging other countries to roll out the CPP program, the aim is to see packaging technology and design become more globally recognised as a profession, which in turn will encourage more people to attain greater packaging skills and knowledge, with the flow-on effect of more people developing long-term careers in packaging across the globe. The CPP designation should also assist companies to recognise and employ highly skilled packaging professionals through international transfers and exchange programs.

Attaining the CPP designation is an excellent investment in a person's professional development and the credential defines the packaging professional allowing organisations to seek out and hire the right professional based on verified knowledge, skills and industry contributions. In an ideal world, all companies who are hiring packaging professionals should ensure that the CPP designation is a recognised and required skill set for the hiring and promotion processes.

The CPP is the premier designation in the industry, signifying excellence as a packaging professional with the most recent IoPP salary survey revealing that CPPs can earn between 7% and 10% more than their non-certified co-workers.

Using the CPP program to assess and evaluate one's professional competency validates them as internationally proficient as a packaging professional, a cut above their peers.

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- Compact size. This makes VP600 the perfect desktop **small color label printer for tight spaces.**
- Individual 200 ml ink tanks to **reduce replacement cost.** You get more labels between ink change and fewer user intervention than many entry level printers



## Chocolate bar wrapping machine

The RCB-HS wrapping head machine by system manufacturer Loesch Verpackungstechnik is designed to produce hermetically sealed bars of chocolate. The R series for small chocolate products and bars combines a premium look and product protection with an end-to-end hermetically sealed pack.

The compact RCB-HS machine platform is capable of handling primary packaging in modern chocolate production. Able to process 600 packaged products/min, the unit operates

continuously and produces the fold wrap in one wrapping head.

It circumferentially heat-seals or cold-seals the packaging material as required, with the sealing jaws sealing film against film to prevent thermal damage to the products. The sealing jaws affix the sealed film areas to the underside of the packaging in the discharge area. The product uses just one hot- or cold-sealable packaging material, to reduce costs and resources.

The product enables quick and simple format changeovers within a large size range, thereby increasing efficiency and performance. Set-up time for a format changeover is approximately 60 minutes, with belt changes and cleaning able to be carried out without the use of tools. Optional equipment such as an autosplice device is also available.

**Allied Industries Pty Ltd**

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



## Digitally print on flexible packaging materials

AstroNova's Food-Safe Flexible Packaging Printing Solution has been designed to work with TrojanLabel presses. The digital, narrow-format solution can be used in either a standalone printing mode or inline with standard packaging equipment for a complete 'print and pack' process.

The combination of the ink and lamination offers a food-friendly packaging solution that allows users to seal in both horizontal and vertical form fill and seal machines, while using low temperatures for high-speed sealing.

Going digital will allow flexible packaging printers to produce short- to mid-level packaging runs on demand. This feature includes the ability to print barcodes and variable data.

The ultrathin, white gloss PET film was developed to be receptive to the company's water-based inkjet inks. The inner transparent sealing layer of the film protects food products from coming into contact with the outer layer. The water-based inks used are food-friendly, odourless and free of reactive chemicals, making them safe and compliant with international standards.

**Metromatics Pty Ltd**

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## Kikkoman LuciPac A3 Sanitation System

The Kikkoman LuciPac A3 Sanitation System is an innovative, new test for hygiene monitoring that offers better detection and higher sensitivity.

Just as easy and fast to use as conventional ATP tests, but its patented A3 technology has been proven to find food residue that other products miss.



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# Keeping it zipped

Food brand owners are facing many challenges around balancing industry waste initiatives while addressing the needs to preserve, protect, contain and deliver convenience for the consumer of products. As the flexible packaging segment continues to grow, Zip-Pak sees itself playing a larger role in supporting the food industry by identifying ways to help avoid or reduce waste.

According to the Flexible Packaging Association, the top five reasons brand owners increased flexible packaging use in the last few years has been due to: reduced production costs, improved consumer convenience, improved shipping/transportation efficiencies, ability to fit consumer lifestyle trends and reduced environmental impact.

“Within the breakfast category in particular for the food industry, Zip-Pak has seen some brands extend their offering from the traditional ‘bag-in-box’ format to a ‘flexible package’ with the added benefits of a zip reclosure,” said Michael Debono, National Sales Manager of Zip-Pak in Australia and New Zealand.

“Zip-Pak has been offering reclosure/reseal solutions for flexible packaging for many years and we believe this type of packaging can help to provide a simple solution to the waste problem.”

Once a flexible pack is open, there is a challenge to retain freshness, protect and contain the contents and allow for portion/dispensing control for consumer convenience. In some cases, the consumer may dispense the contents into another resealable pack, which can add to the landfill waste challenges we face.

Adding a resealable zipper onto a flexible pack provides a way to avoid products being decanted and ensures the flexible pouch is the primary pack. The zipper is able to be opened and closed multiple times until the content is consumed.

Zip-Pak’s Pour & Lok resealable zipper is one solution available that can help to shift a flexible package into a resealable/re-usable package. The press-to-close, foldable zipper is pre-applied to film in the side gusset of the package for an

easy-to-use pour spout. Suitable for a range of food products such as cereals, biscuits and sweets, “the solution is also suitable for recycling with resource-recovery initiatives such as Red Cycle,” said Debono.

## Lockable flexible pouch

For products such as dishwasher or laundry ‘tablets’, one of the challenges for flexible packaging has been how to provide the child lockable cap which is available in a rigid package format. Zip-Pak has been developing child lockable features on flexible pouches.

“In some cases, there has been a need for a ‘child impeding’ reclosure for flexible packaging through to a ‘child resistant’ solution for flexible packaging. Child impeding will be a difficult-to-open reclosure zip but not tested and certifiable, while the child resistant solution is designed to be compliant and certifiable when added to a flexible package and submitted for Child Resistant certification,” Debono said.

Zip-Pak has many years of experience with resealable zip solutions for flexible packaging. Whether that be related to lockable zips, the zip application process or zip equipment, it has a range of innovative solutions.

Adding zip application functionality onto a VFFS or flow wrapper is not new. Zip-Pak works with a number of global OEMs for new projects but also with brand owners and converters to retrofit their existing equipment. Debono said his company has recently seen an increase in inquiries for advice in this area, and he and his technical team are happy to help.

Zip-Pak Pty Ltd  
www.zippak.com

# NEWS



## Non-destructive leak detection solutions available at Heat and Control

Oxipack Leak Detection and Heat and Control have announced a strategic partnership to support Australian and New Zealand customers in the food industry, as well as pet food, pharmaceutical and related industries.

Heat and Control has been appointed the exclusive agent to sell and service Oxipack's specialist non-destructive leak detection in airtight or vacuum packaging, effective immediately.

The new partnership allows Heat and Control to bring Oxipack's testing method and specialist non-destructive leak detection solutions to its processing and packaging portfolio. Heat and Control will leverage its extensive sales and service infrastructure in order to sell and support Oxipack equipment within defined regions, including application testing, service and spare parts.

"We are very pleased to be aligning with Oxipack," said Robert Marguccio, Business Manager – Packaging & Inspection Systems, Heat and Control.

"This non-destructive leak checking technology will enable us to provide a solution to customers that need to check their products for micro leaks. Traditionally micro leaks are found using a water bath, which means the tested product cannot be returned to the line after a pass result. Oxipack uses a unique, vacuum system which allows the sampled product to be returned to the line after passing the test. The unit can also be calibrated to a known leak rate, should that be acceptable."

Heat and Control provides a range of solutions for manufacturers of both fresh and processed meat, poultry, seafood, potato and snack products, nuts and fruit and vegetable products in Australia and New Zealand, and Oxipack's products will complement its portfolio of processing and packaging solutions.



## Lightweight tub and lid packaging range

The Eurotub 250 g and 400 g tubs are over 20% lighter than previous tubs, with the reduction in material providing sustainability benefits during manufacture and transportation. At the same time, the tubs retain their reliability and functionality to provide easy handling for the end consumer.

The range of tubs also includes 500 g and 1000 g sizes, useful for accommodating all types of spreads. The tubs' light weight and robust design provide product protection and ease of use. The range of available sizes provide opportunities for family ranges while the wide choice of decoration options allows the establishment of individual brand identity with on-shelf appeal.

**Berry**

[www.berryglobal.com/home](http://www.berryglobal.com/home)



## Lid clipping machine

The Proseal LC1 lid clipping machine is a fully automatic, in-line lid-placing, denesting and tamping system that can be used for a range of food processing applications.

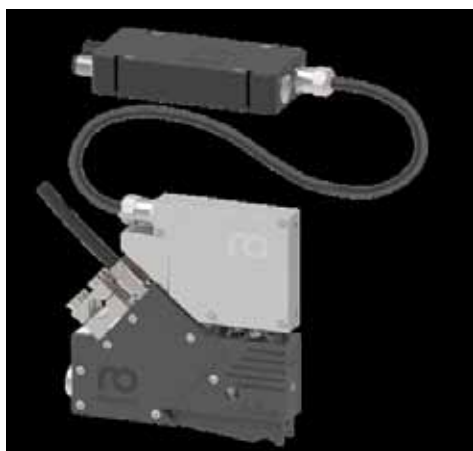
The machine is designed to cut labour costs while using recyclable packaging and can accept trays from any conveyors. Its menu-driven control panel and Eseal energy-efficient electric seal system make the device suitable for use in the food processing industry. It can provide helpful step-by-step prompts and a notable increase in seal force.

The device can clip lids onto film-sealed trays and take trays directly from a filling conveyor when no film lid is required. Through the use of these features to avoid any loading errors, the LC1 system can be fully integrated with other in-line equipment including upstream tray-sealing machines.

**Proseal Australia**

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





## Gluing solution

The SpeedStar Compact hot-melt adhesive application head from Robatech has small installation dimensions and provides speed and high precision over its service life. It has all the features that provide added value to the packaging, converting and graphic industry.

The jetting head SpeedStar Compact is one of the fastest and most compact application heads available for high-precision hot melt adhesive applications.

With up to 800 switching cycles/s, it enables very small bead and dot application for particularly demanding and clean gluing applications at high production speeds.

Robatech integrated an automatic stroke adjustment to ensure that the electromechanical jetting head can maintain the precision in adhesive application over the entire service life of approx. 500 million operating cycles. Manual readjustments are no longer necessary, and maintenance-related interruptions are reduced.

Compared to its predecessor SpeedStar Diamond, the new electric head has been technically optimised in terms of hardware and is, therefore, more durable. As the electronic unit is detached from the head, SpeedStar Compact is also 46 mm smaller.

Space-saving integration into systems and entire machines becomes possible for the users. The higher protection class IP55 allows better use in wet areas.

SpeedStar Compact is now available as a single- and multi-head in a short or long version.

**Robatech Australia Pty Ltd**

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



## Aseptic recyclable juice carton

The Tetra Stelo Aseptic carton package released by Sumol+Compal features an easy-grip carton, one-step opening and a smooth, slim shape. It is lightweight and FSC certified, offering a contemporary look to enhance on-shelf differentiation for products. The Tetra Stelo Aseptic carton is designed to offer brands a large, continuous surface for branding, storytelling and nutrition information.

The carton is recyclable and has the option for customers to use a plant-based cap made from polymers, which are derived from sugar cane. The carton's ergonomic shape offers improved functionality for consumers and is offered in a range of sizes.

The range of packages starts at 1000 mL, with new sizes to be added soon.

**Tetra Pak Marketing Pty Ltd**

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

## Landfill-biodegradable cling wrap

Landfill-biodegradable cling wrap from BioGone will allow the film to be biodegraded away when disposed to a landfill-type environment.

Through its proprietary technology, BioGone has produced what is claimed as the world's first landfill-biodegradable cling wrap. Unlike conventional cling wraps that do not break down, BioGone's environmentally responsible alternative will be digested by the natural microbes in a landfill.

This innovative process is thanks to the addition of a proprietary organic additive, which is mixed with conventional polyethylene at the time of manufacture and allows the entire product to be consumed by microorganisms naturally present in a landfill.

Maintaining good strength, stretch and clear transparency, the quality wrapping is suitable for food displays and products. The product is designed to provide users with the peace of mind that they are using a product that won't be left for future generations to deal with.

BioGone cling wrap is BPA-free, PVC-free, certified for food contact and microwave safe. Available in three different sizes, BioGone has rolls to suit household and commercial kitchens and food wrapping operations of all sizes.

**Bio-Gone Plastics**

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



## CASE STUDY

### Aussie technology protects wines from counterfeiters

An Australian-developed technology called eBottli has the potential to defend Australia's wine export industry against the global trade in counterfeit wines.

The anti-counterfeit technology solution provides a suite of tracking and blockchain data technologies, geolocating services for bottles or containers, and unique identifier labels for winemakers. Developed with the support of the South Australian Government, the solution is designed to help ensure a wine's authenticity and helps address the issue of brand trust for Australian exports — a considerable issue in markets such as Asia.

Australia's wine exports are currently valued at \$1.25 billion, but counterfeit alcohol is a bigger business, with potential losses to the global industry due to counterfeits estimated to reach \$4.3 trillion by 2022. In China, some experts claim around 50% of wine over \$35 is fake, and up to 70% of bottles sold are fraudulent. This is a problem for Australian wine exporters, reeling from bushfires, drought and the threat of a post-COVID trade war with China.

Founded by Adelaide-based Nathalie Taquet, eBottli is working with 12 clients across Australia, including vineyards in the wine regions of McLaren Vale and the Barossa Valley in South Australia. Premium artisan wine labels can be particularly vulnerable to export fraud.



"It's quite unbelievable the extent that wine counterfeiters will go to. Some will simply replace valuable wine with cheap substitutes in the bottle, with fake labels. They also add juice, and spices for added flavour. Other dodgy bottles contain no grapes at all, and even have harmful substances added — such as lead acetate, which is a sweetener," Taquet said.

"The eBottli technology also allows wine drinkers to connect with the vineyard and see the story of how the bottle came to be in front of them. Our ultimate plan is to have wine bottles arrive to the customer overseas and then they can use their smartphones to scan the label and read its Australian story of origin," Taquet said.

### Robotic case packer for glass bottles

For packing glass bottles, Sidel has introduced an agile, auto-adjustable Pick & Place case packer — Cermex FlexiPack — which provides ease of operation and enables 10 min changeovers and enhanced bottle flow management.

The robotic case packer can handle between 10,000 and 18,000 bottles/h. Each sub-module is designed to be flexible; namely, the bottle channel infeed, numerical-axis gantry manipulator and Regular Slotted Container (RSC) case conveying part. The case packer can be complemented by an upstream DiviArm — a positive bottle distribution system which limits friction when the bottles are distributed in three or four lanes.



Suitable for a range of bottle diameters and heights, the case packer can handle different bottle necks or cap designs due to the end grippers, which can be easily changed. Brushless movements smooth the product flow, while allowing automatic adjustments for changeovers.

The case packer facilitates ease of use with a human machine interface (HMI), which can help operators with statistics, diagnostic and maintenance procedures, through tablet-based navigation. The HMI also provides a step-by-step guide for new format creation while automatically generating the respective changeover settings, thereby increasing autonomy and maximising uptime.

Flow and speed management at every step of the packing process serve to protect the glass bottle and its label, while noise reduction is achieved by limiting the pressure and shock subjected to the bottles.

**Sidel Oceania Pty Ltd**

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





# DNA barcodes to track food provenance

**F**rom tracing vegetables to their agricultural source to identifying the manufacture of counterfeit goods, the ability to quickly and accurately determine the provenance of an object can be critical in many applications.

Current labelling technologies are often labour-intensive and easy to subvert, particularly in light of complex global supply chains.

In a novel solution that can help determine the origin of agricultural products and other goods, Harvard Medical School scientists have developed a DNA-barcoded microbial system that can be used to label objects in an inexpensive, scalable and reliable manner. The system could be particularly useful in tracing supply chains following detection of foodborne pathogens.

Reporting in *Science* on 4 June, the research team describes how synthetic microbial spores can be safely introduced onto objects and surfaces at a point of origin, such as a field or manufacturing plant, and be detected and identified months later.

The use of custom-synthesised DNA sequences as barcodes has been shown in principle to be effective for labelling food and other items. To be widely useful, DNA barcodes must be produced cheaply in large volumes, persist on objects in highly variable environments and able to be reliably and rapidly decoded — hurdles that have thus far not been overcome because DNA is fragile.

In the study, Michael Springer, associate professor of systems biology in the Blavatnik Institute at HMS, and colleagues set out to determine if DNA barcodes packaged within microbial spores, which can be sprayed onto crops and identified months later, could help solve these challenges.

The spores are derived from baker's yeast and a common bacterial strain used in a wide variety of applications, such as

probiotic dietary supplements, and designed to be incapable of growing in the wild to prevent adverse ecological effects.

"Spores are in many ways an old-school solution and have been safely sprayed onto agricultural goods as soil inoculants or biological pesticides for decades. We just added a small DNA sequence we can amplify and detect," said study corresponding author Springer.

"We also worked hard to make sure this system is safe, using commonplace microbial strains and building in multiple levels of control," Springer added. "We hope it can be used to help solve problems that have enormous public health and economic implications."

The study team created synthetic, non-viable strains of *Bacillus subtilis* bacteria and *Saccharomyces cerevisiae* yeast that harbour unique DNA 'barcode' sequences.

To read the DNA barcodes, the researchers used an inexpensive CRISPR-based tool that can detect the presence of a genetic target rapidly and with high sensitivity. The technology, called SHERLOCK, was developed at the Broad Institute of MIT and Harvard, in a collaboration led by institute members James Collins and Feng Zhang.

The team examined the efficacy of their barcoded microbial spore system through a variety of experiments. DNA-barcoded *B. subtilis* remained detectable on tagged produce even after washing and cooking.

"Spores can survive in the wild for an extremely long time and are a great medium for us to incorporate DNA barcodes into," said study co-first author Jason Qian, a graduate student in systems biology at HMS. "Identifying the barcodes is straightforward, using a plate reader and an orange plastic filter on a cell phone camera. We don't envision any challenges for field deployability."

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## Packaging leak testing device

The Sealtick TSE6089L is a non-destructive packaging leak testing device designed for testing of large packages such as pet food, grains and coffee beans against leak.

It is designed to ensure that

packages are sealed against moisture, oxygen and biological contamination, which may accelerate product deterioration.

The Sealtick leak testing devices operate based on the vacuum decay testing principle. They only require air and power to operate. The tests can be initiated by switching on the device, lifting the lid, putting the packages in and closing the lid. The test is completed in less than 40 s and returns a fail or pass reading to the operator. The packages that pass the test can be returned to the production line for packaging.

The test results are stored in the internal memory that can hold data for 30 days. The data can be transmitted to the PC via the ethernet or USB connection for record keeping and quality traceability. Users can control the device setting and program up to 20 customised test methods to optimise testing of different-sized products through the PC.

The Sealtick TSE6089L features a horizontal test bed with stainless steel construction, which allows packages to be lifted in and out of position, and a display panel. This test bed can accept packages with sizes up to 700 x 500 mm and up to 20 kg. It can also be customised to suit different customer requirements.

**Bestech Australia Pty Ltd**

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



## Automatic filling and capping systems

The Adelphi Response Monobloc Filler is an automatic filling and capping machine capable of filling a range of container sizes, from 3 to 250 mL. It has a filling accuracy of  $\pm 0.25\%$  when configured with existing Response benchtop units. A second head can also be added to accommodate increasing production demands for fill sizes 5–100 mL.

The filler is designed to include Adelphi's Response benchtop volumetric unit to provide increased filling capabilities. The filler is composed of parts that are 316 stainless steel, and has a 10 min strip-down time. It also features intuitive HMI touchscreen controls for operations, and is designed to handle liquids, oils, creams, pastes and solids in suspension.

Suitable for products such as olive oils, sauces and condiments, jams and yoghurts, the machine can fill bottles, jars and screw-top vials.

**Emrich Industries Pty Ltd**

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



## Tabletop digital colour label printer

AstroNova's QuickLabel QL-120X is a tabletop digital colour label printer with a two-year warranty.

It's built on the Kiaro! platform and includes high-capacity ink cartridges and dye-based inks.

It is designed to produce sharp images at up to 1200 dpi with vibrant colours at fast print speeds and can operate for extended periods in rigorous production environments, making it suitable for the food and beverage industry.

The printer can print on synthetic and matte or high gloss paper labels that are 1.27 to 10.668 cm wide, using the same dye-based ink.

Its printheads snap in for fast on-site changeover and can print up to three times more labels over their lifetime than those on the original QL-120.

The printer comes with one free licence to the company's labelling software, CQL Pro, allowing users to design, manage and print labels.

It also has a native printer driver and utility for Windows, allowing the printer to be used in a variety of business operating environments.

**Metromatics Pty Ltd**

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





# Egg-based coating to extend shelf life of fruit and veg



**T**he Brown School of Engineering lab of materials scientist Pulickel Ajayan and colleagues have developed an inexpensive micron-thick coating to protect fruits and vegetables, using eggs which would otherwise be wasted.

When the egg-based coating was applied to fresh produce by spraying or dipping, it showed an ability to resist rotting for an extended period comparable to standard coatings like wax but without some of the inherent problems.

The work by Rice undergraduate students Seohui (Sylvia) Jung and Yufei (Nancy) Cui is detailed in *Advanced Materials*.

Along with being edible, the multifunctional coating retards dehydration, provides antimicrobial protection and is largely impermeable both to water vapour to retard dehydration and to gas to prevent premature ripening. The coating is all natural and washes off with water. "If anyone is sensitive to the coating or has an egg allergy, they can easily eliminate it," Jung said.

Egg whites (aka albumen) and yolks account for nearly 70% of the coating. Most of the rest consists of nanoscale cellulose extracted from wood, which serves as a barrier to water and keeps produce from shrivelling, a small amount of curcumin for its antimicrobial powers and a splash of glycerol to add elasticity.

Lab tests on dip-coated strawberries, avocados, bananas and other fruit showed they maintained their freshness far longer than uncoated produce. Compression tests showed coated fruit were significantly stiffer and more firm than uncoated and demonstrated the coating's ability to keep water in the produce, slowing the ripening process.



Credit: Jeff Fitlow/Rice University

An analysis of freestanding films of the coating showed it to be flexible and able to resist cracking, allowing better protection of the produce. Tests of the film's tensile properties showed it to be just as tough as other products, including synthetic films used in produce packaging. Further tests proved the coating to be nontoxic, and solubility tests showed a thicker-than-usual film is washable. Rinsing in water for a couple of minutes can completely disintegrate it, Ajayan said.

The researchers continue to refine the coating's composition and are considering other source materials. "We chose egg proteins because there are lots of eggs wasted, but it doesn't mean we can't use others," said co-corresponding author Muhammad Rahman, a research scientist in Ajayan's Rice lab, who mentored and led the team.

Jung noted the team is testing proteins that could also be extracted from plants rather than animal produce to make coatings.

*Multifunctional Bio-Nanocomposite Coatings for Perishable Fruits. Advanced Materials, 2020; <https://doi.org/10.1002/adma.201908291>.*



## Automated flow wrapper

Bosch's Pack 403HE is an automated horizontal flow wrapper that can wrap a variety of products, including biscuits, chocolate, frozen food and meats, at medium-to-high speeds while meeting strict hygiene requirements.

It is designed to work in harsh environments and can produce up to 400 packages/min, with a maximum film speed of 76 m, according to the manufacturer.

It has an automatic film splicer that allows for fast film changes without interrupting production; as well as servo-driven power feed rollers that maintain film tension and tracking and cantilevered and removable discharge belts that can reject faulty packages with compressed air.

The machine can be cleaned with alcohols or acids and rinsed with water to prevent contamination with allergens, germs or unwanted ingredients. It contains washdown motors and gearboxes, meeting the BISSC standard; sanitary feet; clear tubes to help users detect contamination; and a continuously welded, stainless steel main frame plate. Its stainless steel guarding, robust plastics, removable parts, sloped surfaces and gaps between the machine's components can help simplify cleaning. The machine's cable connection to its electrical cabinet has also been sealed to prevent the penetration of moisture or any unwanted substances.

**Robert Bosch (Australia) Pty Ltd**  
[www.bosch.com.au](http://www.bosch.com.au)

## Paper fibre-based vacuum skin packs

Packaging specialist MULTIVAC offers a range of packaging solutions with PaperBoard, including MultiFresh vacuum skin packs, using paper fibre-based materials. The company's packaging materials can be run on standard machines. By using different functional layers, it is possible to produce packs from paper fibre-based materials which meet the barrier requirements for sensitive products. The packs can be designed to enable the end user to separate the cardboard backing from the plastic barrier layer, and then put it into the paper recycling. The company also manufactures mono films and paper fibre-based materials. The range includes solutions which can be run on thermoforming packaging machines as well as traysealers.

When running PaperBoard, the thermoforming packaging machine or traysealer can be customised to the particular products and output requirements of the customer. The machine can also be combined with modules for product infeed and pack discharge, as well as for labelling or marking of the packs. Flat vacuum skin packs can be produced on the R 105 MF thermoforming packaging machine from reel-fed cardboard composites.

The machine also features a fully automatic process, with the material being supplied on the roll. Formable paper and cardboard composites are also available from the roll in different grammage weights for running on thermoforming packaging machines. This enables flat packs and packs with deeper cavities to be produced, so products with different heights and shapes can be packed.

The PaperBoard range also includes board trays and pre-cut card sheets for running on traysealers. The automatic T 800 traysealer line features vacuum skin packs being produced from pre-cut card sheets. The line features an L 310 conveyor belt labeller, which applies a full-wrap label to the pack.



**MULTIVAC Australia Pty Ltd**  
[www.multivac.com.au](http://www.multivac.com.au)

## Ion air knife

The EXAIR Gen 4 Standard Ion Air Knife reduces static electricity approximately 30% better at low inlet pressures, saving compressed air while improving production speeds, product quality and surface cleanliness. The air knife eliminates static on plastics, webs, sheet stock and other product surfaces where tearing, jamming or hazardous shocks are a problem.

The product is CE, UL and RoHS Certified and design features include a metal armoured high-voltage cable to protect against abrasion and cuts, integrated ground connection and electromagnetic shielding. A selectable voltage power supply has also been designed to operate Gen4 products.



The product incorporates EXAIR's Standard Air Knife, minimising compressed air use by inducing surrounding airflow at a ratio of 30:1. The amplified airflow carries the ions to the target, thereby eliminating static charges in less time. Air volume and velocity are controllable from a 'breeze' to a 'blast' to wipe or forcefully blow away debris.

The Air Knife product line is available in 76 to 1219 mm lengths. The electrical ion source is shockless, with no radioactive element.

Applications include surface cleaning, neutralising plastics, bag opening, printing machinery, packaging operations and elimination of static electricity shocks.

**Compressed Air Australia Pty Ltd**  
[www.caasafety.com.au](http://www.caasafety.com.au)





## White cheese processing line

The Tetra Pak complete processing line for feta-type white cheese products has been designed to assist white milk producers

and traditional cheesemakers discover new opportunities in the white cheese market. The best-practice line provides a fully automated and integrated solution to ensure a high standard of food safety and speed to market.

The complete processing line has been designed to produce a diverse range of white cheese products, using technologies such as ultrafiltration and high shear mixing, to facilitate customer exploration of a new market segment and increase current production capacity. The processing line works for both BAF (bacteriological acidified feta) and GDL (glucono delta-lactone) using a hygienic and safe process to ensure long product shelf life.

**Tetra Pak Marketing Pty Ltd**  
[www.tetrapak.com/au](http://www.tetrapak.com/au)

## Food-grade soft gripper

The OnRobot food-grade soft gripper is able to pick a wide array of irregular shapes and delicate items in food and beverage, cosmetics and pharmaceuticals production, as well as manufacturing or packaging.

The flexible electric gripper uses three interchangeable silicon-moulded cups in star and four-finger configurations to pick up almost any small object under 2.2 kg with a delicate, precise touch. It is food-grade certified (complies with FDA 21 CFR for non-fatty items and EC 1935/2004) and, unlike traditional vacuum grippers, requires no external air supply, so it can reduce both cost and complexity.

OnRobot's One System Solution is a platform that provides a unified mechanical and electrical interface between leading robot arms and any OnRobot end-of-arm tooling (EoAT). The

One System Solution has been expanded to include integration with robots from ABB Robotics and Hanwha Precision Machinery.

While the soft gripper is suitable for food and beverage applications, it also provides flexible, delicate gripping for manufacturing and packaging. Grip dimensions ranging from 10 to 118 mm are possible depending on the cup used.

**Scott Automation & Robotics Pty Limited**  
[www.scottautomation.com](http://www.scottautomation.com)



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# Optimising your tank cleaning operations

Tank cleaning equipment is designed to yield specific performance under specific conditions. A variety of factors can affect results. Even when tank cleaning equipment appears to be working as expected, there may be room for improvement. Adjustments are often possible to achieve more consistent results, improve efficiency, reduce the length of time tanks are out of service and lower operating costs.

**H**ere are seven optimisation tips to consider as you evaluate the current performance of your tank cleaning equipment.

## 1. Heated water vs impact

Hot water is costly but may be needed to remove some residues. However, in some cases, hot water may be eliminated by increasing cleaning impact. This can result in a dramatic reduction in energy costs and savings of thousands of dollars annually. Ask your local sales engineers for assistance in determining if increasing impact can eliminate hot water use in your application. This may involve a proof-of-concept test to compare the cleaning performance of high impact vs hot water. We highly recommend evaluating impact by a tank cleaning expert.

## 2. Operational considerations

Two tanks that are the same size with the same residue may require completely different tank cleaners and cleaning times. For example, a 3.7 m diameter tank used for food storage may be cleaned using a medium-impact tank cleaner with cycle times averaging 10 minutes if any food residue is still wet. The same size tank may require a high-impact tank cleaner and take longer to clean if any liquid has dried in the tank.

## 3. Look for issues associated with 'striping'

High-impact tank cleaners that provide 360° cleaning coverage use solid stream sprays. These sprays don't overlap as they rotate, so there's a small distance between each path and striping occurs. The greater the distance the nozzles are from the vessel walls, the greater the distance between paths.



drawbacks to increasing pressure. Higher liquid pressures can introduce turbulence to the jet stream, reducing throw and cleaning efficiency.

### 5. Cleaning hard-to-reach areas

Internal obstructions, like agitator shafts/blades, coils, etc., block the spray from hitting the tank wall. Certain areas, such as skim lines, require more cleaning than others. Having the flexibility to reposition tank cleaning equipment can help you achieve complete cleaning in less time and reduce operating costs. An adjustable ball fitting can be used to clean vessels in sections: clean the top half of the vessel, then lower the device and clean the bottom half of the vessel or change the angle to clean difficult locations. Lances and adjustable flanges can also be used to help position nozzles properly. For example: if the tank only has a single-entry opening, special lances and flanges can be used so the nozzle turret can be easily moved to multiple locations in the tank. Special lances and flanges can also be used to position nozzles so the spray impacts directly on heavily soiled areas or skim lines.

### 6. Review system components

In addition to the tank cleaner, other equipment can affect cleaning performance. Pumps: check that you have the correct pump for your system. The efficiency of the pump will have a direct impact on flow and the performance of the tank cleaning equipment. Piping and valves: be sure pipes and valves are properly sized. Incorrect sizing can lead to inadequate flow, pressure and fluid velocity. Filtration: confirm that required filtration products are installed. Filters or strainers should be properly sized and installed to prevent clogging. Monitoring: ensure gauges or flow meters are placed in critical locations. System monitoring will enable quick detection and resolution of problems.

### 7. Perform regular maintenance

After installing the tank cleaner, documenting the performance will help establish a baseline for later comparison. Also, be sure to inspect equipment on a regular basis. Verifying operation can be challenging since it is difficult to visually observe tank cleaning equipment while operating. Problems with tank cleaning equipment often become evident when trace amounts of residue are detected after cleaning. Watch for debris build-up. Debris can clog nozzles, become embedded in bushings and gears and cause the unit to stop working or reduce service life. Even if you are just cleaning with water, rust or scale from piping may accumulate in the unit. Make sure to put your tank cleaners on a routine maintenance program to check bushings, seals, bearings and nozzles and make sure they are not worn or clogged. Be sure to document when service is done and how frequently components are replaced.

*Spraying Systems Co. Australia are tank cleaning experts that can provide help to optimise tank cleaning operations. Local sales engineers are available to evaluate a site's current operations and equipment, and offer optimisation suggestions to achieve specific tank-cleaning objectives.*

Spraying Systems Co Pty Ltd  
www.spray.com.au



In some operations, striping can be a contamination risk. Switching to a three- or four-nozzle configuration, rather than the standard two-nozzle configuration, is one way to reduce striping and minimise risk.

### 4. Shorten cleaning time by increasing impact

Simple adjustments to liquid pressure and flow may enable a reduction in the number of cycles needed for thorough cleaning. Faster cleaning saves time and reduces water and chemical use. To increase impact and cleaning efficiency, it's far more effective to increase flow than liquid pressure since increasing flow rate intensifies impact at a greater rate than increasing pressure. In fact, doubling flow rate boosts impact as much as 100% while doubling liquid pressure provides only 40% more impact. In addition, there are other

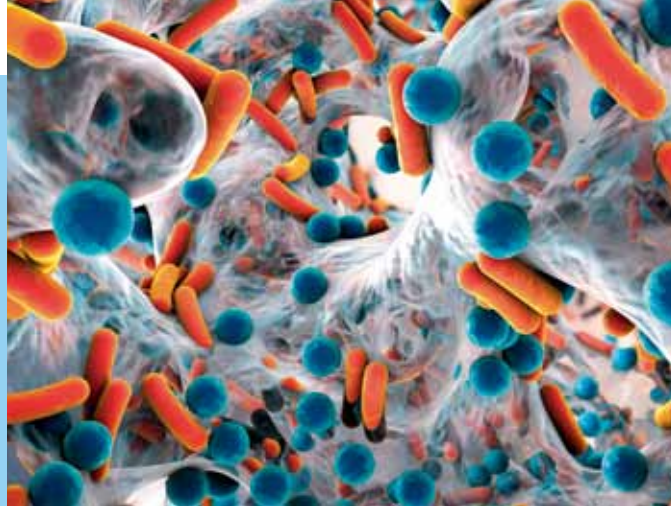
## 10 biofilm hot spots in meat processing environments

Biofilms are comprised of microorganisms embedded in a self-produced matrix that normally adhere to a surface. In the food processing environment, they can be the cause of food spoilage or the transmission of foodborne pathogens. A new study published in the *International Journal of Food Microbiology* has found biofilms on 9.3% sites including food and non-food contact surfaces.

In the study paper, titled Identification of biofilm hotspots in a meat processing environment: Detection of spoilage bacteria in multi-species biofilms, the authors assess the presence of biofilms within a meat processing environment, processing pork, poultry and beef, by the detection of microorganisms and at least two biofilm matrix components. Sampling included 47 food contact surfaces and 61 non-food contact surfaces from 11 different rooms (filling, cutting, weighing, smokehouse, slicing, packaging area, tumbling, curing, delivery, ham and cooking rooms) within an Austrian meat processing plant, either during operation or after cleaning and disinfection.

The 108 samples were analysed for the presence of microorganisms by cultivation and targeted quantitative real-time analysis.

Ten biofilm hotspots were identified in the study, seven of which were sampled during operation and three after cleaning and disinfection.



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Five biofilms were detected on food contact surfaces (cutters and associated equipment and a screw conveyor) and five on non-food contact surfaces (drains and water hoses), resulting in 9.3% of the sites being classified as biofilm positive.

The identification of biofilms in water hoses and associated parts highlights the need of a frequent monitoring at these sites.

Overall, the lowest levels of microbial presence were detectable in the slicing room and in the packaging areas.

The work in the study is designed to ultimately determine the presence of multi-species biofilms within the meat processing environment, thereby identifying various sources of potential contamination. The knowledge gained about the presence and composition of biofilms (ie, chemical and microbiological) is designed to help prevent and reduce biofilm formation within food processing environments.

The full study is available online: <https://doi.org/10.1016/j.ijfoodmicro.2020.108668>.

## Semi-automatic meat press

The Beck-Maga Meat Press is a semi-automatic flattening machine with various applications in the meat and catering industries. Beef, pork and poultry can be pressed into cutlets, steaks, chops and schnitzels. For whole muscle meat products, the unit preserves the freshness and weight of the meat. The result is a delightfully tender and juicy end product. It can also flatten minced meat and vegetable mixes into burgers, or doughs into pizza bases or wraps.

The press is activated when the tray is pushed into the chamber. In 1 h, it can perform up to 800 flattening cycles with efficient operators. The desired thickness of the end product is adjustable between 5 and 30 mm. Four security levels ensure safe operation. A relatively compact unit at 45 x 60 x 70 cm and 120 kg, it can be placed on a bench or supplied with a dedicated stand.

**Barnco Pty Ltd**

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



## Washdown guns

Designed and manufactured in The Netherlands by AKBO, the Blue King spray gun uses 16% less water than a regular cleaning gun. This represents a significant water savings for some industries — especially food manufacturing, dairy processing and industrial kitchens.

The spray gun is built to be able to withstand temperatures up to 90°C and water pressures up to 30 bar, and has

FDA approved EPDM seals and rubber protection.

Two styles are available, with or without a trigger guard. The trigger guard itself is made from strong stainless steel covered with rubber insulation.

For user comfort, the lever and handle are ergonomically designed and also covered in velvety soft rubber, while the body of the spray gun is made from brass.

For safety, there is an arrow to show the direction of water flow. This can be an important safety measure when using hot water. Inside the spray gun, there are double seals for added security and durability.

The design of the spray outlet has been carefully considered. It provides even water distribution and is drip-free — even at the widest spray pattern. Adjusting the spray is easy and doesn't require tools.

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## CASE STUDY



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### Glossy sweets: production improved with humidity control solution

Achieving a glossy, attractive finish on confectionery products is essential. The final coating on scorched almonds, chocolate-coated sultanas and similar items is achieved using a confectioner's glaze. Shellac is the main ingredient in the glaze and it is very sensitive to relative humidity (RH) levels. RH levels higher than 55% can cause the finish to become patchy or cloudy. Moisture Cure Commercial was able to provide a humidity control solution to improve productivity for Gourlay's Famous Sweets.

Gourlay's Famous Sweets (since 1896) is a sweet retail and confectionery manufacturing business in Launceston, Tasmania. 25 years ago a line of sweets was added using the panning process. It involved having a panning machine, which is like a large cement mixer, where the nuts or other product are placed in the pan then tumbled while chocolate is added over several hours. This gives a smooth, even chocolate coating over the nuts. The final step of the process is adding confectioner's glaze to improve the appearance and extend the shelf life.

Located on the cool and humid north coast of Tasmania, the sweet manufacturer needed to control the humidity in the panning room where confectioner's glaze was applied. High interior humidity caused by wet weather would stop production until dryer conditions prevailed.

Gourlay's contacted Moisture Cure Commercial to provide a 50% RH environment in their panning room even during the wettest season. The humidity and temperature requirements were suitable for a refrigerant dehumidifier. Moisture Cure Commercial was able to calculate the required capacity based on climate data from the Bureau of Meteorology and recommend a 96 L/day machine. It was then able to match the requirements to an appropriate model.

The FRAL FDNF 96 dehumidifier was selected for the project and the specifications and calculations were sent to Launceston. The portable FDNF 96 was recommended, rather than a fixed model, to allow the machine to be used in other areas of the factory for drying spills or leaks. Portable dehumidifiers have an integral reservoir for the condensed water so no plumbing is required.

The FRAL FDNF 96 provided Gourlay's Fine Sweets with an effective solution that enabled it to continue production despite wet conditions.

The Gourlay's management team was highly satisfied with the system. "Up until we purchased your humidity machine, we had to wait for low-humidity days. With your machine we can glaze more often with the humidifier pulling moisture out of the air, very often half a bucket in four hours. This allows us to be more productive in this type of work," said Michael Wood, Gourlay's Fine Sweets Manager.

Moisture Cure Commercial has a range of high-capacity dehumidifiers to control the humidity in most production rooms. Desiccant machines are recommended in cool rooms or where the RH must be very low (<40%). Refrigerant dehumidifiers have low power consumption and running costs while still achieving RH levels as low as 40%. They work best at temperatures higher than 15°C. The machines have been used successfully in confectionery production all along the east coast from Queensland to Tasmania. Actively controlling the humidity allows production to proceed regardless of the weather.

*Moisture Cure Commercial*  
[www.moisturecurecommercial.com.au](http://www.moisturecurecommercial.com.au)





## Automatic meatball and croquette former

The Mainca FA-1500 is an automatic meatball and croquette former. While food forming is a simple task, it is also tedious

and time-consuming. This unit will allow you to redirect valuable labour power to more critical tasks.

The FA-1500 connects to any filler via a 30 mm nozzle, and interchangeable drums allow it to form many different sizes from 7 g up to 60 g. Its compact design and simple connection make this unit suitable as part of a value-added line with battering and breading machines, or simply on its own as a meatball former.

With an air compressor and any filling machine, this will allow you to produce up to 7500 meatballs/h. No electrical power is needed to operate this machine. When the moulding cavity is filled, the former automatically ejects the product and returns to the starting position to be filled again. It is designed to be consistent in the size and weights of the meatballs produced with any single mould. It comes with a dedicated stand for easy transportation and stability.

**Barnco Pty Ltd**

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## TPO meter

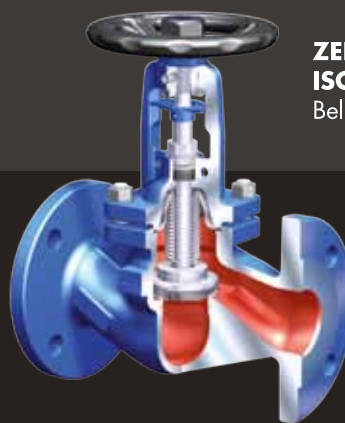
Anton Paar has launched its TPO meter, TPO 5000, which uses a new approach to determine the headspace oxygen and dissolved oxygen in finished beer and soft drinks in one go. It is built for long-term use close to the production line, with splash-proof, stainless steel housing. Samples are taken directly from cans, glass bottles and PET bottles, and measured in less than 4 min. After measurement, the device cleans itself. The user interface and result outputs of the meter can be personalised to suit individual requirements.

Beverage containers are positioned easily and centred automatically by the device. The opto-chemical oxygen sensor runs with minimum maintenance and requires no special attention during daily work. A customisable home screen provides quick access to favourite functions and up to 5000 measurement data sets can be stored on the instrument to provide full traceability.

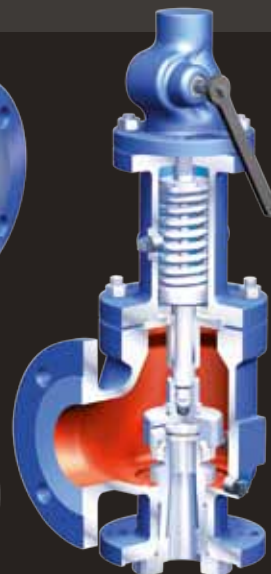
The product can be used with Anton Paar's carbonation meter to measure both TPO and dissolved CO<sub>2</sub> in one measuring cycle. CarboQC selectively determines the true amount of carbon dioxide in beverages and can be used as a standalone instrument as well.

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### Ultrasonic sanitisation system

Ultrasonic Sanitisation from Cleenson provides complete high-security disinfection of tools and parts through a triple action. Firstly, the Ultrasonic Cavitation process kills microorganisms by breaking down the cell walls. Secondly, detergent is used. A diluted drop of detergent in water is enough to break and kill many types of bacteria and viruses, including coronavirus, by undoing their lipid membranes. Thirdly, hot water at 80°C acts as a powerful disinfectant.

Ultrasonic cleaning provides microscopic cleaning quality and homogenous results, including in complicated geometric parts. It also provides complete disinfection through ultrasonic cavitation and detergent. Ultrasonic cleaning can save water, as immersion cleaning reduces water consumption. The system is also designed to be safe for the operator and its working environment. Direct contact with dangerous products is avoided.

Cleenson has 50 years of experience in ultrasonic cleaning, specialising in equipment from 100 to 15,000 L, with a custom design and construction for each client, and a clear specialisation in ultrasonic equipment with low frequency (28 kHz) of greater cleaning power.

**Cleenson**

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



### Mixing and agitation process technology

The NORD MAXXDRIVE industrial gear units are suitable for industries

that use mixing and agitation processes, even under extreme conditions. The FEM-optimised, compact design enables operation under ultimate external loads. The modular system provides many options for tailored solutions.

For agitator applications, the industrial gear units can be equipped with a SAFOMI (Sealless Adapter for Mixers) IEC adapter. This adapter combines the functions of a standard IEC adapter and an oil expansion tank in a single component. SAFOMI is available for parallel gear units and in sizes seven to 11, for maximum output torques from 25 to 75 kNm.

The combination of the industrial gear units, IEC adapter and drive motor is suitable for mixer and agitator applications, to reduce wearing parts and attached components. The adapter features an integrated oil expansion volume. The parallel gear unit and IEC adapter are installed in installation position M5, with an output shaft pointing downwards.

With the SAFOMI IEC adapter for MAXXDRIVE industrial gear units, the number of components required for mixer applications can be reduced, whilst at the same time operational reliability can be increased.

**NORD Drivesystems (Aust) Pty Ltd**

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

### Food-grade stainless steel panel PC

Interworld Electronics has released the FABS-919AP food-grade stainless steel panel computer. The FABS-919AP is housed in a fanless aluminium enclosure with a 304 or optional 316 grade stainless steel bezel that provides IP66 or IP69K front panel protection. Part of the FABS Series, the FABS-919AP is optimised to meet the hygienic design requirements of DIN EN 1672-2 and DIN 42115, Part 2. These European standards establish high standards for food and beverage processing equipment.

The product is powered by an Intel 6th/7th generation Core I processor with DDR4 memory. A full HD 19" 1280x1024 resolution LCD and 7H anti-scratch durable Projected Capacitive Touch Screen make it suitable for operator panel and HMI control applications. The standard 350 cd/m<sup>2</sup> or an optional 900 cd/m<sup>2</sup> high brightness screen is available.

The FABS-919AP provides two COM, two GbE LAN ports, two USB3.0 ports and support for internal Mini-PCIe expansion modules. Communication and network options include 3G/4G, WiFi/BT, GPS and RFID. The internal 2.5" SATA3 HDD is easy to access, allowing the operating system and data storage to be upgraded at any time.

The product supports DC 9~36V power input and an operating temperature range of 0 to 50°C. Operating system support includes Windows 10 or IoT. The product is 64 mm deep; panel and VESA mounting makes the FAB Series convenient to install.

**Interworld Electronics and Computer Industries**

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## Temperature check mobile app

JRI has developed the MyFoodCheck mobile app for temperature checks to assist food production operations with food safety procedures and the implementation of quality control plans.

The application is designed to automate food temperature readings and proactively detect temperature excursions at each stage of the food production process: during the receipt of goods, the storage, the cooking, and hot and cold storage of food and cook-chill.

The secure, digital paper-based HACCP solution works in conjunction with the Bluetooth-connected Bluetherm One thermometer. It transmits the temperature measurements directly to the application via a tablet or smartphone. If the tolerances are exceeded, a list of corrective actions is suggested, allowing the operator to make quick decisions.

Available on Google Play and soon on iTunes, the app provides multiple benefits.

It saves time as temperature readings are automated; consequently, food safety risks across the organisation can be reduced.

The app creates detailed reports required for HACCP documentation which is always up to date for audit purposes. Weekly PDF and activity reports are generated to ensure traceability of measurements and corrective actions can be taken if required.

The app can be used in conjunction with the JRI MySirius monitoring platform, which automatically carries out 24/7 recording and alarming of fridges, freezers, cool rooms and ovens using the latest IoT devices. Operators can activate the FoodCheck tab in their account and allow all collected data in the app to be automatically synchronised, backed up and available at any time on the JRI MySirius web platform.

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# Clearing the haze for white wine makers

**H**azy white wines are a sure-fire way to turn consumers away. Whether it's sauvignon blanc, semillon or chardonnay, most consumers prefer their favourite white to have a clean, clear sparkle. If white wines look cloudy it is a sign of protein instability and most consumers will presume it is faulty.

Research led by the Australian Wine Research Institute (AWRI) in partnership with the University of South Australia is ensuring white wines will always look their best using a novel magnetic nanotechnology that is designed to quickly and efficiently remove haze-forming proteins in white wine.

Funded by Wine Australia, the research combines AWRI wine research with the capabilities in surface nanoengineering developed at UniSA's Future Industries Institute.

Lead researcher Dr Agnieszka Mierczynska-Vasilev said the technology shows promise as a sustainable alternative to conventional bentonite fining treatments, potentially saving the wine industry millions.

"Protein haze is a serious problem for the wine industry. Not only because consumers see it as a defect, but also because conventional bentonite treatments can cause significant wine volume loss, which is also reflected in the bottom line," Mierczynska-Vasilev said.

"In Australia, the overall estimate of loss caused by bentonite fining is around \$100 million annually, and globally, this equates to approximately \$1 billion per year.

"Winemakers traditionally use bentonite to remove proteins and prevent haze formation, but as it is a clay, it swells in

the wine solution and can lead to a loss of wine volume of approximately 3%.

"Using this technology, winemakers could potentially remove haze-forming proteins safely and efficiently, without bentonite-associated volume loss, and importantly, could do so multiple times with the same nanoparticles."

The technology uses magnetic nanoparticles coated with acrylic acid polymers which, when placed in heat-unstable wine, attract and bind proteins to the nanoparticles' surfaces. The particles are then drawn from the wine using a magnet, leaving behind a clarified product devoid of haze.

Tested on unfined\* 2017 sauvignon blanc, semillon and chardonnay from South Australia, researchers found that the magnetic nanotechnology successfully removed 98% of haze-forming proteins from wines in 10 consecutive adsorption-desorption cycles, clearly indicating its ability for re-use.

"Unlike bentonite, a defining feature of this nanotechnology is its ability to be regenerated for re-application, without any adverse effects on the wine's colour, aroma and texture compounds," Mierczynska-Vasilev said.

"While there is still some way to go before the technology can be practically applied in wineries, and the need to obtain regulatory approval both in Australia and overseas, given the clear economic, sustainable and sensory benefits, this nanotechnology has a very strong potential for adoption — it's absolutely a 'watch this space'."

\*unfined: unclarified by filtration.





### Food and waste sludge pump

Moving food or waste sludge can be a difficult proposition for pumps. Liquids can be thick and corrosive, and definitely require the right pump. Italian-made Ragazzini brand hose pumps can move thick slurry comfortably when sized correctly with the right tubular element. The pumps use a roller on bearing method to 'squeeze' the tubular element, creating a vacuum on the suction side, enabling pumps to operate on high suction lifts.

The pumps are set up to run slowly to promote longer hose life and they are able to pump good size solids. Flows from just a few litres per minute up to 180 m<sup>3</sup>/h can be delivered, depending on pump model.

The pump has food-grade hoses capable of being sterilised with hot water (to 70°C) and/or steam (to 120°C). Ragazzini pumps can also be run in reverse, making them suitable for tank emptying and filling operations.

The Rotho peristaltic system major advantages include: simple, gentle pumping action preserves the quality of products whose organoleptic stability is fundamental; good system for transferring fragile delicate foods; avoids contamination as the substance circulates inside the tube without coming into contact with the mechanical parts of the pump; guarantees the hygiene and cleanliness indispensable in this sector; and it allows total CIP and SIP sterilisation of the tube and connectors in contact with the food products.

Other features include: leak detection; no seals or valves; and can run dry without damage.

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## Lightweight oxygen analyser

Michell Instruments has launched a lightweight oxygen analyser, available through AMS Instrumentation & Calibration, that is designed to provide accurate and cost-effective control of oxygen from 500 ppm  $O_2$  to oxygen purity in safe area applications. The XTP501 Oxygen Analyser uses Michell's thermos-paramagnetic technology, designed for accurate and stable measurements. These sensors are non-depleting, and are made to last for the life of the instrument under normal operation, which keeps the cost of ownership low as only minimal maintenance is required and there are no consumable parts to replace.

The analyser offers users a choice of ranges to provide the best accuracy for specific applications. There are six available ranges to choose from: 0-1/21/25%  $O_2$  and 20/80/90 to 100%  $O_2$ , which are suitable for a variety of application needs, from monitoring trace oxygen in inert gases to ensuring the purity of oxygen generated for use as an industrial gas.

The XTP501 is a highly stable instrument at  $\pm 0.25\%$  of span per month and accurate to  $\pm 0.02\% O_2$ . Because they have no moving parts or liquid components, thermo-paramagnetic oxygen sensors are robust and not affected by vibration or sudden shocks.

With a lightweight IP55-rated casing, the analyser is compact and easily installed. Suitable for indoor installation, the IP55 case makes it robust enough for most industrial safe-area conditions such as food and beverage production, non-hazardous installations and small-scale industrial gas production. It also has an intuitive touch screen interface that is easy to use, interrogate and set up.

**AMS Instrumentation & Calibration Pty Ltd**

[www.ams-ic.com.au](http://www.ams-ic.com.au)

## Analyser

The CropScan 3300H On Combine Analyser from CropScanAg Solutions is designed to transform the way farmers measure nitrogen availability and uptake across their fields. The protein layer provided across the field can be used to generate a wide range of field maps based on real nitrogen measurements.

CropScanAg Solutions has developed a cloud-based website that automatically collects the field files from the combine for yield, protein, moisture, oil, starch and fibre as well as soil moisture, rainfall and temperature from on-farm probes and weather stations. When the device is connected to the internet using the built-in modem, the data is automatically transmitted to the farmer's personal account in the CropScanAg cloud, thus allowing the farmer and their agronomist to access the files from a smartphone, tablet or PC.

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## Stainless steel human-machine interfaces

The SPC-500 series of stainless steel human-machine interfaces (HMIs) is aimed at applications with strict safety and hygiene requirements. In the food and beverage, pharmaceutical and packaging industries, all equipment must meet strict requirements for hygiene, robustness and reliability. Advantech's SPC-500 series is designed to satisfy these requirements and withstand operation in harsh environments.

Powered by an Intel Core i3-6100U processor, the HMIs are enclosed in a sealed housing made of SUS304L-grade stainless steel, which is resistant to oxidation, corrosion and bacteria, and allows cleaning with harsh detergents. For applications requiring regular sanitisation, the IP69K rating provides full protection against dust and water ingress (even at high temperatures and high pressure). The glass panel features IK08-rated shatter protection in case of external impacts, eliminating potential food contamination or safety hazards caused by broken glass. Moreover, the HMIs are compliant with the DIN EN 1672-2 safety and hygiene standards for food processing machinery, making them suitable for commercial and industrial food processing. With the integration of a VESA mount, the HMIs can be quickly and securely mounted on any support arm system, fixing system or stand.

To further protect against corrosion and equipment failures, the HMIs have a pressure compensation element that balances pressure differences between the housing and surrounding environment due to changes in airflow temperature. The pressure compensation element delivers IP68/69K-rated protection from vapour and contaminant ingress to help ensure reliability during equipment operation.

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# Dissolving biofilms with a yeast-based solution

Growing inside pipes and on surfaces, bacterial biofilms can cause headaches for the food processing industry.

**R**emoval of biofilms is crucial for the food industry, as they can potentially cause large-scale product contamination. Harsh cleaning products and detergents called surfactants combined with scrubbing are the most effective methods of removing biofilms. However, biofilms are notoriously difficult to eliminate as one of their main functions is to protect encased bacteria from threats such as chemical cleaning agents, and the agents themselves can also sometimes cause issues for the environment and may damage the some surfaces.

Now researchers from the University of Tsukuba have shown that enzymes produced by yeasts — called biosurfactants — can dissolve stubborn biofilms and improve the efficacy of current chemical treatments, thus also lessening their toxicity and environmental impacts.

In a study published in peer-reviewed journal *Langmuir*, the researchers explain the new method of tackling biofilms, using cleaning agents derived from microbes themselves.

“Certain *Candida* yeasts can naturally produce biosurfactants called sophorolipids during the fermentation of oils,” explained co-lead author Professor Andrew Utada. “Previous studies have shown that sophorolipids have some degree of antimicrobial activity, but there is conflicting information on the effects of these compounds on biofilms composed of the Gram-negative pathogen *Pseudomonas aeruginosa*.”

Gram-negative bacteria such as *P. aeruginosa* and *Escherichia coli* are a major cause of hospital-acquired infections, killing

thousands of people every year. Using microfluidic channels, the researchers showed that sophorolipids do a better job of disrupting established *P. aeruginosa* biofilms than commonly used chemical surfactants.

Surprisingly though, there was no evidence that sophorolipids actually killed the bacteria. A mutant *P. aeruginosa* strain that produces excessive amounts of biofilm matrix was therefore used to examine the underlying mechanism of biofilm dispersal, revealing that sophorolipids appear to weaken the interaction between the biofilm and the underlying surface and break the internal cohesiveness of the biofilm itself, leading to disruption.

Although biosurfactants are biodegradable and less harmful to the environment than their chemical counterparts, they are costly to produce. To address this issue, the researchers tested the effects of sophorolipids in combination with the widely used chemical surfactant sodium dodecyl sulfate, with encouraging results.

“Combination testing revealed a synergy between sophorolipids and chemical surfactants, with the two agents together demonstrating stronger antibiofilm effects at concentrations about 100-fold lower than when either one was used in isolation,” said PhD candidate Bac Nguyen.

Although reducing the costs associated with the production of biosurfactants is the long-term goal, this synergistic approach to biofilm elimination may also open new doors in the medical industry.





### Batch cooker for functional gummies

The JellyCook batch cooker from Baker Perkins is a small, flexible production system for the functional gummy and confectionery markets. The batch cooker feeds a ServoForm Mini depositor; the system produces starch-free gummies and jellies. Products using gelatine, pectin, carrageenan or blends as the gelling agent can all be produced.

The semiautomatic cooker produces 30 kg batches, with an output of up to 50 kg/h; a high output model with two cookers will produce 100 kg/h. A reservoir tank accepts syrup from the cooker and feeds the depositor. An intelligent control system with an adaptive weighing system guides the operators through the batch-making process, with operator actions prompted by messages on the HMI screen.

The device is oil heated, with electricity the only service needed. To provide consistency between batches, ingredient additions are recalculated in real time to match quantities added rather than set points. This also enables the right amount of active ingredients, colours and flavours to be added at the end of the cook cycle.

The Baker Perkins ServoForm Mini's starch-free depositing process is hygienic and accurate, making it suitable for the functional confectionery market. The system is also suitable for pilot plants in larger companies.

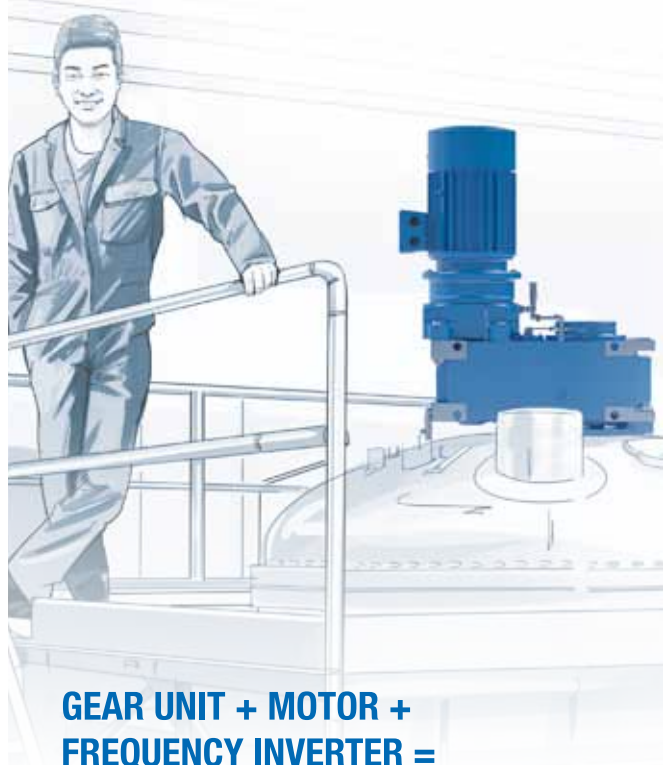
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# All you need to know for food texture testing

Textural testing is a well-known and established method for evaluating the mechanical and physical properties of food products as well as for pre-and post-quality control. It has been applied for testing a wide range of food products including baked goods, cereals, snacks, cheese, fruits, vegetables, meat, poultry, fish, pasta and pet food.

**S**tandard tests such as compression, tension and flexural testing are used to evaluate food texture. These tests can measure the hardness, crispiness, crunchiness, softness, springiness, tackiness and any other food properties. This testing principle has also been approved by the experts. It is believed that the measurements from this test highly correlate with human sensory attributes associated with textural quality.

## Where is texture analyser used?

Food textural testing can reveal the way the product is grown, harvested or processed. It also gives the opportunity to highlight quality improvement opportunities throughout the supply chain and production process. For example, at the early stage of R&D, researchers can try new or alternative ingredients in manufacturing new products and compare it with products manufactured with existing ingredients. During production, the texture analysers can be used to evaluate the physical

properties which can be used to control process variations such as temperature, humidity or cooking time.

## Testing method

Texture analysers are not only used to measure food properties such as chewiness, crispiness, crunchiness, hardness, but they are also useful for performing more complex tests such as texture profile analysis (TPA) as well as measuring the amount of work required to cut, penetrate or shear the products.

How does a single machine perform a wide range of tests?

The main factor that contributes to the versatility of texture analysers is the availability of more than 70 probes, jigs and fixtures which allow the instrument to perform a wide range of test and measurement for food products.

For example, the Volodkevitch Bite Set fixture demonstrates how the instrument can perform human action and turn it into measurable quantity. It imitates incisor teeth as it shears through meat, vegetables, fruit, crunchy or crispy





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food products. This bite set consists of upper and lower teeth that are brought together until they are almost touching. The sample to be tested are positioned on the lower tooth. The peak force required to shear the sample are measured which can be translated into the tenderness, toughness and firmness of the samples.

There are wide range of grips and fixture in various sizes, gripping styles and capacities for different measuring applications. The choice of fixtures highly depends on the tested sample. If the sample has a flat surface, it is preferable to use compression plates that are larger than the sample. For samples with uneven surface such as fruits or vegetables, small-diameter probes are used.

### Jigs and fixtures for food applications

The TA-1 texture analyser from Lloyd Instruments offers a large working area and can be used for routine and complex texture analysis up to 1 kN force with measurement accuracy

“Texture analysers are not only used to measure food properties such as chewiness, crispiness, crunchiness, hardness, but they are also useful for performing more complex tests such as texture profile analysis...”



of 0.5%. It can be used with any types of jigs and fixtures for testing all types of samples in food applications. The grips and fixtures are developed regularly to widen the range of testing applications.

For example, there are test jigs specially designed for texture analysis of uncooked hamburger patties and test jigs for measuring the stickiness of pasta or spaghetti. The test jigs for hamburger patties are developed due to huge demand for burger patties. As the prices are competitive, manufacturers developed a wide range of products with varying composition; from 100% prime ground beef to meat with additives such as fat, bulking agent and salts. These patties can be tested by using a cylindrical probe, which opens out in an inverted cone shape with a flat end of 25 mm diameter, to apply force to the burger. It can also be used to test reformed and cooked meat.

On the other hand, the test jig for pasta is developed to determine the ideal cooking time for uncooked pasta. The stickiness of the pasta relates to its starch content which determine its cooking temperature and time. The test is initiated by mounting the pasta sheet on the base table where a matching rectangular probe is used to apply uniform compression force to the pasta sheet. The force required to withdraw the probe is measured.

There are also many types of test fixtures such as a five-blade version of Kramer type shear cell for general applications. It is generally used for measuring the bulk shear and extrusion forces of samples with irregular shapes and sizes such as meats, fruits and cereals. This five-blade configuration overcomes the limit of force applied by the traditional ten-blade Kramer type shear cell.

### Other considerations

Most texture analysis devices can also be integrated with external plug and play devices such as temperature and humidity probes. This can be controlled through the software to simulate conditions at the manufacturing environment. The software can also be used to manage user access and pre-set test procedures. This is useful as researchers tend to develop specialised and novel test method in their experiments.

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### Compact self-loading pneumatic sieve

The Russell Compact Self-Loading Sieve from Russell Finex is a complete standalone pneumatic screener which conveys, screens and discharges material in one operation, without requiring additional conveyors or discharge systems. The self-loading sieve can screen powders and granules, and convey them up to 5 m with minimal operator involvement, which allows the screener to be positioned in more convenient locations.

The self-loading sieve is supplied with a control console and a vacuum pump all mounted on a stand to provide easy installation. The company's range of screening machines is designed to improve accuracy, increase productivity and reduce complexity. Russell Finex also has a range of sieving and filtration equipment, and can design custom-built solutions.

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### Small internal mix spray nozzles

EXAIR's 1/8 NPT small internal mix spray nozzles atomise fluids up to 106 L/h. The nozzles mix the liquid and air inside the cap and produce fine atomisation. They can be used on liquids with a viscosity up to 300 cP.

The nozzles are available in narrow-angle round pattern, wide-angle round pattern and flat-fan pattern, and are used to coat parts in containers, cool laminates, or apply paint and lubricant. They combine liquid and compressed air to create a coating of liquid that can be easily adjusted to meet the needs of the user's application.

Users can coat, cool, treat and paint a variety of products. Used with water or coolant, the nozzles are an efficient way to evenly cool hot items in automated processes.

The stainless steel construction adds to their durability and corrosion resistance. They are also available in 1/4 and 1/2 NPT in a variety of flow patterns and liquid rates to meet the user's needs. External mix and siphon-fed atomising nozzles are available too, as well as patented no-drip versions. All models are adjustable and CE compliant.

**Compressed Air Australia Pty Ltd**

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

### Cleaning system

The SANI-MOVE system from Tecpro is designed to provide a practical and simple cleaning solution for small to medium-sized premises and vehicles. It is compact and mobile, consisting of an easy-to-manoeuvre trolley, stainless steel tank with a 9 L capacity, built-in compressor and ultrasonic atomising gun to produce fine droplets of disinfection solution.

Ultrasonic atomising guns mix the disinfecting liquid with compressed air to create small droplets, which then hit a resonator cup, producing sound waves the human ear can't detect. This process shears the droplets into even smaller droplets (or fog) that are only a few microns in size, suitable for uniform and widespread distribution of the disinfecting liquid.

The operator can adjust the air pressure and percentage of atomised liquid to meet different hygiene needs without leaving residues on surfaces or fabrics. Due to the tank's size, the system can operate for 50 minutes on a single tank with the operator's selected chemical at the chemical manufacturer's recommended dilution rate. It can then be plugged into the nearest power point and the user can fog over the desired areas.

**Tecpro Australia**

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







### Oil-free compressed air system

The i.Comp Tower T series all-in-one, 100% oil-free and compact compressed air system is suitable for applications such as in breweries and food production. The series provides an efficient supply of compressed air from a compact, robust and service-friendly package.

It comprises a reciprocating compressor, refrigeration dryer and optional filters all within one robust housing and assembled on two compressed air receivers. The compact reciprocating compressor has a novel drive concept and

features a specially developed, high-performance, permanent magnet motor with integrated control electronics. This motor operates at a 90% efficiency rate, while its in-built frequency converter minimises switching operations and energy losses. This makes the series efficient in all load phases, providing the exact amount of compressed air required at any time.

Suitable for sensitive applications, the series is able to deliver up to 570 L/min at pressures up to 11 bar. The compressor block does not contain any oil and the compressed air supply system provides dry compressed air at a pressure dew point of +3°C, with any condensate drained off.

Optimised flow paths and cylinder cooling minimise wear and tear while providing maximum efficiency. The cylinders' combined inlet area helps reduce intake air losses, while the cooling air flow enables the compressor to manage ambient temperatures of up to 45°C. A sound-insulating PE hood makes the units quiet.


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## CASE STUDY



### Moving locations easy for brewery wastewater system

Located in one of Sydney's most beautiful areas, 4 Pines Brewing Company recently moved and upgraded its existing wastewater treatment plant to meet production growth.

4 Pines Brewing Company is known for its commitment to sustainable operations, with social and environmental responsibility integral to its ongoing growth strategy. Expanding its Brookvale premises in Sydney needed to leave a minimal environmental footprint; the brewery's existing wastewater treatment system was therefore upgraded rather than replaced in the move.

"4 Pines strives to waste less and repurpose. We re-use and recycle. It was important that our existing wastewater treatment system came with us when we expanded onto the new site," said Tristan Houghton, Maintenance Manager at 4 Pines Brookvale.

Aerofloat's original wastewater treatment system installed in 2018 was re-used and readily transported to the new site. Aerofloat's engineers were on hand to support the installation and to ensure the system was up and running so that 4 Pines could resume operations within the tight schedule.

"The engineers at Aerofloat are terrific to work with. They really care about ensuring the best result possible and are always on hand if we have any questions or need specialist advice," said Houghton.

Aerofloat's compact wastewater treatment system had been installed on the previous Brookvale site in 2018 to meet rapid production growth following acquisition by global giant AB InBev. The site quickly became a major location for producing 4 Pines' famous Australian brews, with production increasing by up to 50%. Aerofloat's compact system managed the rapid growth in wastewater flow and has ensured ongoing compliant effluent for the company ever since.

As part of the recent move to new premises, Aerofloat upgraded the existing system by streamlining the chemical supply, including optimising the flocculant to the brewery's wastewater and installing new flow sensors to regulate control. Combined with the

latest human-machine interface (HMI) technology, 4 Pines staff can keep an eye on the system even when not on-site. Aerofloat technicians can also log in remotely to check and adjust the system as requested and offer advice to ensure uninterrupted operations.

"We've been able to increase efficiencies across our operations and reduce our environmental footprint even further since the Aerofloat wastewater treatment system upgrade," said Houghton.

The wastewater treatment system at 4 Pines consists of Aerofloat's patented dissolved air flotation (AeroDAF) technology. The system meets the brewery's need for a compact system that not only fits within the space available but also ensures an odour-free solution. With the bar area located next to the production centre, an odourless effluent is imperative to ensure a pleasant environment for the brewery's clientele. The AeroDAF is an enclosed system and any potential odours are vented above the roofline.

Aerofloat's AeroDAF technology is mechanically simple, low maintenance and affordable. The absence of mechanical scrapers seen in more traditional DAFs means that operations aren't suspended for standard DAF cleaning. It also eliminates the need for a reaction tank, sludge pump and sludge hopper for cleaning.

The 4 Pines solution was designed as a set-and-forget system, with Aerofloat's automated controls including chemical dosing, chemical make-up, level control, water consolidation and pH correction. The system removes the solids from the brewery wastewater and corrects the pH before discharging to sewer.

The Aerofloat system has consistently given excellent effluent results, both at the previous site and the new 2020 location, and meets both 4 Pines' environmental mandate and Sydney Water's strict discharge limits.

View a video case study of Aerofloat's wastewater treatment solution at 4 Pines at [www.aerofloat.com.au](http://www.aerofloat.com.au).

*Aerofloat (Australia) Pty Ltd*  
[www.aerofloat.com.au](http://www.aerofloat.com.au)





### Wireless IIoT radar level sensor

The Micropilot FWR30 from Endress+Hauser is a cloud-connected radar and 80 GHz wireless IIoT sensor, providing full transparency in the storage and transport of liquids. The wireless IIoT sensor combines high-end technology and user-friendly digital services in one device. The instrument's continuously recorded measurement data can be accessed at any time and from anywhere, due to the device's cloud connection, with communication enabled by an integrated SIM card.

Installation is simple, and can be performed in less than 3 min. An integrated battery allows operation without an external power supply; a particular advantage for measuring difficult-to-access points. The compact device is also suitable for stackable tanks and enables a plug-and-play solution for flexible installation.

Alongside the measured level, users receive information about the location of their storage tanks and containers via the cellular communication system. The instrument provides facts, helping users optimise logistic and storage processes, and save time by providing continuous and easy access to inventory information.

The Micropilot FWR30 can be used for level measurement and inventory management of mobile and stationary plastic tanks. It is also possible to use the instrument to track mobile storage tanks. The free radiating measuring device covers measuring ranges up to 50' and temperatures between -20 and 60°C. Because it uses non-contact measurement, the instrument can be used in all liquid media. It is resistant to corrosion, abrasion, viscosity or toxicity and can be used in a range of industries.

Users can choose from a range of services that include Netilion Value and SupplyCare Hosting. All digital software applications can be used on various end devices, such as desktop, tablet or smartphone, and comply with the highest security and data protection requirements.

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## Mobile fogging cart

Spraying Systems Australia has designed a mobile dry-fogging cart that can sanitise a closed area within a few minutes. The mobile fogging cart contains a 9 L pressure pot that is connected to an air atomising nozzle that generates a fine mist. The unit uses the PathoSans (a sister brand of Spraying Systems) sanitising solution PathoCide.

The MiniFoggerIII air atomising nozzle generates an 8.5-micron particle of dry fog and can emit the solution up to four ways, allowing for wide coverage over an

entire room without leaving a single drop of liquid. This makes it safe for use around computers and other electrical equipment. The unit is designed to provide a thorough and effective sanitising process over an entire area, including high-touch, high-traffic areas and hard-to-reach crevices and corners. It is suitable for a range of industries for both the industrial (abattoirs, hatcheries, food processing plants) and commercial (cafes, schools, aged-care facilities, offices) markets.

Spraying Systems use one of its own sanitisers from its PathoSans division — PathoCide. The PathoSans sanitiser is a hypochlorous acid that is generated through electrochemical activation technology, which is designed to generate two separate solutions (a cleaner and a sanitiser) by only using salt, water and electricity. This makes PathoCide a non-toxic, eco-friendly solution that contains no harsh chemicals or odour. PathoCide is claimed to combat up to a six-log reduction in various illness-causing pathogens and odours.

Used with the mobile fogging cart, PathoCide is designed to help achieve a healthier and cleaner environment by addressing the concerns of hygiene and safety in the workplace with a simple fogging solution.

**Spraying Systems Co Pty Ltd**

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

## Cost and profitability analytics system

ImpactECS by 3C Software helps finance leaders guide their organisation's strategic decision-making process by providing an integrated platform for cost and profitability analytics.

The software connects with existing systems to extract relevant data for costing to create a centralised dataset used to calculate and analyse results. The platform tools include configurable objects for modelling, reporting and workflow, along with a high-performance calculation engine to generate new datasets for analysis, comparison and simulations.

Users can build and maintain models for analytics activities, including product costing, profitability analytics, cost-based quoting, planning and scenario analytics, cost-to-serve, quoting, inventory valuation, supply chain analytics, and more.

Because it calculates the detailed cost at the SKU-level with user-defined attributes, users can drill down to any level to identify root causes of performance. Additionally, users can run unlimited simulations using any variable or assumption, using the model's centralised logic and calculations to evaluate the impact of changes. Built-in charts, dashboards, and other reporting and visualisation tools also provide an environment for sharing and collaborating on cost results.

With installations worldwide, ImpactECS provides manufacturing finance teams the ability to create detailed, dynamic cost and profit models that provide timely and actionable results.

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# Making biscuits from orange juice processing waste

**W**hen fruit is processed, parts such as the core, peel, pips and kernel are discarded. The by-products of the orange juice industry are rich in active compounds and have high nutritional content. Researchers in Brazil have identified a way to make better use of these by-products, producing a flour from orange juice by-product called Orange by-product flour (OBPF).

First, the researchers obtained the fibrous inner layer of fresh oranges after juice extraction. This by-product was manually triturated and washed in water for 30 min, and then the material was oven-dried and ground in a mill and sieved.

The study characterised the resulting OBPF in terms of its chemical composition, dietary fibre, phenolic compounds, antioxidant potential and hygroscopic properties. It then applied this flour to produce biscuits, and evaluated the effect of substituting wheat flour by OBPF.

In general, the properties of the biscuits were not significantly influenced by using OBPF as a substitution for wheat flour.

The study reported that the OBPF presented a very high content of dietary fibre (73.61% dry matter (DM)), minerals (ash = 2.72% DM), and total phenolic compounds ( $534 \pm 30$  mg gallic acid equivalent (GAE)/100 g of DM).

Sensorial analyses showed that biscuits produced with 10% OBPF presented the higher scores. Therefore, the report concluded that the OBPF showed interesting characteristics, suggesting its possible use in the development of fibre-enriched foods such as biscuits.

The study was designed to provide the orange juice processing industries with another strategy towards the application of a circular economy in the food system.

Source:

Castro, L.A.; Lizi, J.M.; Chagas, E.G.L.; Carvalho, R.A.; Vanin, F.M. From Orange Juice By-Product in the Food Industry to a Functional Ingredient: Application in the Circular Economy. *Foods* **2020**, *9*, 593.

For the full article, visit <https://doi.org/10.3390/foods9050593>.

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Implementing ultrasonic cleaning technology removes manual cleaning, safety hazards and creates a safer, more environmentally friendly work environment.

### Increased Cleanliness

Ultrasonic technology has the capacity to reach into components on a microscopic level, cleaning even small or complex applications where a cleaning brush might not reach.

### Protection and Longevity

A properly calibrated ultrasonic cleaner uses touch-free cleaning on a microscopic level that can protect the surface of even the most delicate components.

### Savings

Ultrasonic cleaning utilizes affordable water-based soaps and enzyme solutions instead of spray solvents and toxic cleaning products, saving manufacturers 70 percent or more in solvent costs.



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### Visual support service

Endress+Hauser has released the Visual Support service application, to assist maintenance personnel remotely during the coronavirus crisis. In the acute phase of the pandemic, customers were able to take advantage of the remote audiovisual support free of charge.

Travel restrictions and protective measures due to the coronavirus pandemic have made it difficult to use external service providers in

many cases. In order to carry out critical service work related to instrumentation in a timely manner, Endress+Hauser has taken Visual Support from the pilot project phase to global rollout.

The company's service organisation has been using the possibilities of a cloud-based platform based on the Salesforce customer relationship management system for some time. Endress+Hauser has integrated Visual Support into its support services portfolio, giving customers access to in-depth technology and product knowledge, including the availability and response time from the company's global network of technical experts.

The use of this technology for remote support enables audiovisual support for diagnosis and troubleshooting, commissioning and regular maintenance of field devices. With live video transmission and screen casting, Endress+Hauser's technical support team can help customers in a reliable and flexible manner with their service tasks via remote access.

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# Making milk powder less energy intensive

*Dr George Chen, Professor Sandra Kentish, Professor Sally Gras, University of Melbourne*

In addition to the refrigerated dairy foods that many of us enjoy — milk, yoghurt and cheese, for example — Australia also manufactures more than 220,000 tonnes of milk powder each year.

Dairy powders are often used in commercial baking and the manufacture of chocolate, ice cream and infant milk, as a versatile product that doesn't need refrigeration and has a long shelf life.

However, to produce products like milk powder, whey protein powder and lactose (milk sugar) powder, a lot of energy is consumed in water evaporation and drying.

But the Separation Technologies Team in the ARC Dairy Innovation Hub at the University of Melbourne, in collaboration with the University of Surrey in the United Kingdom, has now demonstrated that a by-product from cheesemaking can be used to more efficiently concentrate the milk, thereby reducing the energy used in the process by up to 20%.

The cheesemaking by-product is known as salty whey, which is the salt and liquid expelled from making semi-hard or hard cheeses like Cheddar or Colby.

Salt is added to the protein-rich cheese curd when making these cheeses; however, less than half of this added salt is retained in the curd. The rest is wasted as salty whey, which is expelled from the curd together with the excessive moisture during curd pressing.

But the pilot scale study shows that milk can be concentrated by 'pulling' water from the milk through a semi-permeable membrane and into the salty whey, thereby drying it out faster than current technologies. The salty whey is known technically as the draw solution, as it is used to 'draw' water across the membrane from the milk.

This process is called forward osmosis (FO), an emerging membrane technology that was originally developed for water treatment.

The process takes advantage of the osmotic pressure generated when water moves across a barrier, such as a membrane. Water will always move into an area with a high concentration of a solute, like salt, from an area with a low concentration solution.

Osmotic pressure is effectively the pressure that would be required to stop water from diffusing through this barrier by osmosis.

“ The work demonstrated that less than 10 kWh of electric energy is required in this forward osmosis process to remove one tonne of water from skim milk...”

”

Since salty whey is readily available in cheesemaking plants it can be used as the draw solution to drive the process of concentrating milk products, before disposal. This avoids or limits the need for the re-concentration of the diluted draw solution in typical forward osmosis systems.

As water naturally flows from low concentration to high concentration solutions, the pumping energy used to deliver the high hydraulic pressure in conventional reverse osmosis processes is no longer required.

In addition to the energy saving in pumping, forward osmosis pre-concentrates milk before it is further evaporated, reducing the energy consumption in these downstream evaporation and drying processes.

Forward osmosis, which operates at below 50°C, can potentially be used as an alternative to traditional thermal treatment systems to remove water from other liquid foods such as fruit juices, avoiding the degradation of heat-sensitive compounds and the loss of their bioactive properties.

The pilot plant was located at the University of Surrey in the United Kingdom and used a draw solution that mimicked salty whey, to concentrate skim milk by a factor of two and a half. The total installed membrane area was 24 square metres, which is about 20 times smaller than might be needed for a full-scale process.

The work demonstrated that less than 10 kWh of electric energy is required in this forward osmosis process to remove one tonne of water from skim milk, which is only half of what is typically required for traditional membrane concentration.



The pilot study located at the University of Surrey (pictured) was used to concentrate skim milk.

For the Australian dairy industry, implementation of this technology could potentially lead to savings of millions of dollars from the reduced steam requirements in thermal evaporators.

This emerging technology offers an energy-efficient alternative to concentrate milk, if unlimited access to a brine stream can be made available within or in the proximity of dairy processing plants. This would be of particular benefit to the state of Victoria that produced more than 60% of the total 8.8 billion litres of milk in Australia in 2019.

Another important process in the dairy industry is the removal of salts, often referred to as demineralisation, which significantly increases the value of dairy products.

For example, when making infant formula and baby foods, a high degree of demineralisation, greater than 70%, is required due to the limited kidney functions in babies and toddlers.

Demineralisation is typically achieved by passing dairy products through a bed of ion exchange resins, which bind strongly with salt ions to produce a demineralised stream. The regeneration of these resins, however, requires the use of additional chemicals that end up in waste streams and lead to high treatment costs.

To eliminate the need for resin regeneration, the Separation Technologies Team have been developing electrically driven processes, like electrodialysis and membrane capacitive deionisation, to separate charged salt ions from milk.

Different to pressure-driven filtration processes that are widely employed in industry, the suite of innovative membrane technologies developed within the ARC Dairy Innovation Hub can provide solutions to processors in not only the dairy industry, but also the broader food and beverage industries.

Together these technologies help address technical and environmental challenges that limit productivity and constrain the growth of business.

*This article was first published on Pursuit.*

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## Beer testing system

The GENE-UP BREW system is designed to provide a fast, simple and accurate method for the detection of spoilage organisms in beer during both production and post packaging. It uses a powerful multiplex, real-time PCR assay system with a simplified workflow that provides good actionable results.

The system comprises a GENE-UP Thermal Cycler coupled with either of the two GENE-UP Brew Kits. The brewPRO Bacteria Screen assay provides risk-based detection and characterisation of lactic acid bacteria (including hop-resistant varieties), as well as *Megasphaera* and *Pectinatus* species. While the brewPRO Wild Yeast Screen assay provides good detection of STA1 positive yeast, and *Brettanomyces* species.

Hands-on time is kept at a minimum thanks to the user-friendly method coupled with the ready-to-use reagents supplied in each kit. The system offers complete flexibility and scalability, anywhere from one through to 96 samples to be tested at one time.

Results are available in as little as 3 h, enabling quality personnel to speed up the decision-making process and increasing productivity.

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## Lactase enzyme range

DuPont Nutrition & Biosciences has created a lactase enzyme range designed to meet the current trend for fermented dairy products that are low in sugar, high in fibre and lactose-free.

The DuPont Danisco Nurica dairy enzyme is claimed to facilitate up to 35% total sugar reduction while generating prebiotic dietary fibre in situ through the natural conversion of lactose. The enzyme allows manufacturers to fine-tune the sugar, fibre and lactose content of dairy products to achieve nutritional claims that benefit consumers who are lactose intolerant or seeking healthier choices.

Standard lactase breaks down the milk sugar lactose into its component parts: glucose and galactose. The functionality of Nurica lies in the natural transformation of the galactose molecule into GOS — GalactoOligoSaccharides — a prebiotic dietary fibre. This process is claimed to deliver up to a 35% reduction in milk sugar, depending on the lactose content in the matrix.

In application trials, the DuPont Danisco lactase has shown no impact on the acidification process, taste or texture. The reported outcome is tasty, stable, high-quality fermented dairy products, tailored to consumer health trends.

Another addition to the DuPont lactase range is DuPont Danisco Bonlacta. Suitable for the lactose-free market, the lactase is fast-acting, stable at high temperatures and is designed to improve the efficiency of dairy production lines.

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## Natural extracts

Sensient Natural Extracts are clean label, GMO-free, all-natural, organic compliant and can be linked to provenance claims. The extracts' authentic tastes are designed to help transform product profiles and build brand loyalty.

Extracts can be presented in liquid or dried (flakes or milled) form, soluble in either water or oil, according to the final product application. Natural extracts can be used by brands to make products more appealing to customers. The use of extracts like herbs, flowers or spices delivers flavours that are natural, not too sweet and boost the sophistication for alcoholic spirits or soft drinks.

Alongside profiles and combinations, the extracts can provide good taste retention and are claimed to keep their flavour profile and taste far longer than their source botanicals. Sensient Natural Extracts are created using several technologies so that each is soluble for use in water or oil. Sensient's PhytoClean Extracts are 100% pure plant — free of residual solvents, offering additional suggestive nutritive and health benefits.

Sensient offers seed-to-shelf transparency that enables manufacturers to see every step of the production process, with the extract range extending to be suitable for a wide range of applications, such as juices, flavoured water, bakery products, ice creams or nutraceutical products. Sensient has more products under creation, and will continue to expand its palette of extracts and taste combinations.

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## Cheese coagulant

DuPont Nutrition & Biosciences has launched the DuPont Danisco Chymostar, a milk coagulating preparation for the dairy industry.

The fermentation-derived cheese coagulant enables fast milk coagulation and is designed to ensure balanced flavour and texture development for a range of dairy applications. It can be used for producing any type of cheese: hard, semi-hard, soft, mould-ripened, low-fat and ingredient cheeses.

The product features good curd formation and firming speed and enables fast flavour development due to its balanced proteolytic profile, thus helping mitigate the time and cost of maturation.

Developed for a wide array of consumers, it is preservative-free, kosher, halal-certified and suitable for use in vegetarian products.

It also meets purity and thermolability requirements for whey quality. Inactivated in whey by standard pasteurisation techniques, it is a purified product — clear of lipase and amylase side activities.

**DuPont (Aust) Limited**

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# Golden artificial tongue used to taste maple syrup



Scientists at the Université de Montréal have found a way to use real gold — in the form of nanoparticles — as a kind of artificial ‘tongue’, to quickly determine how maple syrup tastes. The new method is validated in a study published in *Analytical Methods*, the journal of the Royal Society of Chemistry in the United Kingdom.

The tongue is a colorimetric test that detects changes in colour to show how a sample of maple syrup tastes. The result is visible to the naked eye in a matter of seconds and is useful to producers.

“The artificial tongue is simpler than a human tongue: it can’t distinguish the complex flavour profiles that we can detect. Our device works specifically to detect flavour differences in maple syrup as it’s being produced,” said Jean-François Masson, a UdeM chemistry professor who led the study.

The artificial tongue was validated by analysing 1818 samples of maple syrup from different regions of Quebec, representing the various known aromatic profiles and colours of syrup, from golden to dark brown.

“We designed the tongue at the request of the Quebec Maple Syrup Producers to detect the presence of different flavour profiles. The tool takes into account the product’s olfactory and taste properties,” said Simon Forest, the study’s first author.

Researchers likened the artificial tongue to a pH test for a swimming pool; the test is performed by pouring a few drops of syrup into the gold nanoparticle reagent, and waiting about 10 seconds. If the result stays in the red spectrum, it is used for premium quality syrup. If the test turns blue, the syrup may have a flavour ‘defect’ so it may be used as an industrial syrup in processing.

“It doesn’t mean the syrup is not good for consumption or that it has a different sugar level. It just may not have the usual desired characteristics, and so can’t be sold directly in bottles to consumers,” said Masson, of the ‘blue’ type syrup, which can be used as a natural sweetener in other products.

The artificial tongue could potentially be adapted for tasting wine or fruit juice in future. It may also be useful in other agrifood contexts.



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## ON THE SHELF



## Monday Distillery goes dry before July

Australians have been turning to low-alcohol or no-alcohol alternatives, particularly during the 'Dry July' and 'Ocober' months. Since the COVID-19 lockdown, the low-alcohol trend has risen. According to IRI data, both Carlton Zero and Heineken 0.0 were two of the top five fastest growing beers during the first week of May. Now adding non-alcoholic spirits into the mix, Monday Distillery's first premix option hit the shelves during June.

The founder of Monday Distillery, Sam Manning, said the idea for the drinks started after she struggled to find a tasty option for drinks with friends while trying to stay off the alcohol. Using her background in botanicals and beverages, she set out to develop something with all the emotional connection, taste and vibe of her favourite gin and tonic, without the effects of alcohol.

"People are after more sophisticated, health-conscious options that still offer the feeling of a fun social drink with friends," said Manning.

"The Australian owned and operated distillery has developed beautifully designed bottles that use quirky marketing such as "G&T without the tears" and "rum without the rumble" in packages that look like normal alcoholic drinks.

"Research shows that it's easier to replace a habit with a similar yet healthier one," Manning explained. "Helping people keep that 'relaxing drink' ritual in something that looks and tastes like an adult beverage is something we're told is part of the major appeal."

With three flavours in the range — Classic dry gin & tonic, Exotic spice gin & tonic and a rum-flavoured option — the Monday Distillery drinks are both alcohol-free and sugar-free.



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