

November/December 2023
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what's new in
Food
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Raising the steak

— developing premium profiles for Australian beef

Australian beef producers could lead the world by developing ‘flavour profiles’ for premium products similar to those used in the wine industry, according to a leading University of Queensland researcher.

Sensory scientist and flavour chemist Associate Professor Heather Smyth from UQ’s Queensland Alliance for Agriculture and Food Innovation said current terminology falls well short of describing quality Australian beef.

“The key measure for beef quality has been tenderness or a lack of toughness — but that’s something knowledgeable consumers and the broader market now consider a minimum requirement,” Smyth said.

“Simply describing premium beef as ‘tender’ just doesn’t cut it.

“We already use sensory language to define and promote the qualities of wine, beer, coffee and seafood — so it stands to reason we should also have one for beef.”

Smyth has told the Northern Beef Research Update Conference in Darwin that flavour profiles for beef would boost exports.

“Australia produces such high-quality beef, it would be invaluable to set ourselves apart in that premium space,” she said.

“We should be highlighting the unique flavour qualities from our environments, genetics and the way we manage and treat the beef.”

Smyth said there was industry support from premium brands in Australia that want to differentiate themselves from one another, with flavour being the answer.

“Flavour in beef is derived from genetics, animal management, diet and environment, but we also need to understand what the compounds are that cause those differences in flavour, let alone describing the sensory nuance they might create,” she said.

“After describing the unique flavour and aroma qualities, we would then need to put chemical signatures behind them to ensure what makes our beef so special can be managed consistently and enhanced.”

Smyth said better flavour descriptions for beef would also allow people to connect with the product, the way they do with wine or other food products.

“The Westholme Wagyu Wheel we created with the Australian Agricultural Company (AACo) a few years ago proved that this extra level of information is possible and valuable for consumers and chefs,” she said.

“People selling or marketing beef, even restaurants, need these sensory terms as well as industry training to describe why one steak might be a better choice for a consumer than another.

“Consumers paying premium prices really do want that level of sophistication.

“The beef industry globally suffers the same problem, so this is a chance for Australia to lead the way in creating elite brands based on flavour.”



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Lamb Weston acquires Crackerjack Foods

Lamb Weston has announced the acquisition of Crackerjack Foods, a Victorian-based manufacturer and supplier of frozen potato-based products for the national food services industry.

With over 70 years of history, Lamb Weston is a supplier of frozen potato, sweet potato, appetiser and vegetable products to restaurants and retailers around the world. Committed to producing Australian grown and made potato products designed for the Aussie market, Lamb Weston Australia has a local team, grower partnerships and two processing facilities in Hallam, Victoria.

Commenting on the acquisition, Simone Anderson, Lamb Weston Vice President and General Manager Oceania said that the Crackerjack brand has a strong established customer base in the food distribution sector and is synonymous with potato cakes and battered snacks.

“Crackerjack Foods is a great fit for us — it provides another avenue for our potatoes, adds value to our existing product offering, and enhances our processing capacity and capability,” Anderson said.

Two Crackerjack Foods processing lines are included in the acquisition, one located in Keilor and a new highly automated purpose-built facility for in-line frying of battered products in Campbellfield. Crackerjack’s existing employees will join Lamb Weston.

“Acquiring Crackerjack Foods offers us a new range of products that complement our current portfolio and increases the options available to existing and new customers. We’re thrilled to strengthen our business here in Australia, drive further growth and innovation, and create more value for our employees, growers, customers and stakeholders,” she said.

Crackerjack Foods CEO Bill Fotiadis said Lamb Weston’s shared commitment to quality, customer service and local partnerships was key to the acquisition’s progress.



istock.com/Andrey Mironov

Kellogg to separate into two independent companies

Kellogg Company has announced that its board of directors formally approved the previously announced separation into two independent, publicly traded companies — Kellanova and WK Kellogg Co. The separation is expected to be completed on 2 October 2023.

“After more than a year of comprehensive planning and execution, we are more confident than ever that the separation will produce two stronger companies and create substantial value for shareowners,” stated Steve Cahillane, Kellogg Company’s Chairman and Chief Executive Officer.

Kellanova will have a portfolio focused on snacks and emerging markets, while WK Kellogg Co will build on the foundation of its iconic cereal brands.

“WK Kellogg Co has a 117-year legacy of innovation and the soul of a startup, with an organisation incredibly energised by our future,” remarked Gary Pilnick, who will serve as WK Kellogg Co’s Chairman and Chief Executive Officer following the separation. “As a standalone company, we will benefit immediately from the executional advantages of increased focus and end-to-end integration, while we modernise our supply chain and substantially improve our profit margins. We’re on a profitable journey to take this great business to the next level.”

Visy opens box factory in Qld

Visy’s new corrugated cardboard box factory in Hemmant, Queensland was opened on Monday 9 October. Using the 100% recycled paper, the factory has the capacity to produce up to 1 million boxes a day for Queensland’s food and beverage companies, farmers and growers.

The factory is part of Visy Executive Chairman Anthony Pratt’s commitment to invest \$2 billion over the next decade — \$700 million of that in Queensland.

“The Queensland Government has created a great business environment for manufacturers to invest and grow in Queensland. We’ve invested \$175 million to build the most productive and technically advanced corrugated box making facility in the country. We’ve installed the latest 2.8 m wide corrugator — the most modern corrugator in the southern hemisphere.”

Visy recycles mixed paper and cardboard from Queensland businesses and households at its Gibson Island recycling facility and remanufactures it into 100% recycled paper, which will be used at the new Hemmant factory.



Image courtesy of Visy



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Nestlé celebrates 70 years of its Qld factory

As the world celebrates International Coffee Day on 1 October, Nestlé is also celebrating Nescafé being made at its Gympie factory in Queensland for 70 years.

Operating since 1953, the Gympie factory now produces more than 20 million cups of coffee daily — or 230 cups per second. The team of expert coffee tasters test more than 100 cups of Nescafé each day to make sure the blend is right every time.

The team is also focusing on improving the site's environmental performance, from using 100% responsibly sourced beans, using renewable sources for over 80% of the factory's energy needs, sending zero waste to landfill and a new \$2m project which will save 45 million litres of water annually.

Over the past five years, more than \$20m has been invested in the factory, which aims to improve its environmental performance and reach net zero by 2050.



Fortress Technology acquires Oceania food safety specialist

Global food safety, contaminant detection and checkweighing machine manufacturer Fortress Technology has announced it has acquired Dynamic Inspection, located in New Zealand. This

will be the company's fourth global manufacturing site.

Founded in 1998, Dynamic Inspection manufactures inline food-grade metal detectors in New Zealand, which are used to safeguard dairy and food processing lines in Oceania and APAC.

Dynamic has been affiliated to Fortress since the Canadian firm's inception 27 years ago. The two companies share decades of design and application experience. Now that Dynamic founders Bob Philpott and Steve Atkins are retiring, this longstanding alliance has been formalised with ownership transferring to Fortress.

Meeting in another metal detection circle over 40 years ago, little did the Fortress CEO and founder Steve Gidman and Bob Philpott realise how rapidly their mutual interest would evolve.

"The transition to Fortress now enables us to recruit more experts and expand our manufacturing hub in New Zealand, as well as our business reach. Exciting new products and services will follow," Philpott said.

Based in Cambridge with additional sales and service engineers located in Auckland and Christchurch, Dynamic found success supplying metal detectors, X-ray and checkweighing equipment for dairy lines, specifically milk powder inspection. However, their reach is not limited to dairy applications and they have installed inspection systems for the entire food industry, worldwide.



Sara Lee enters voluntary administration

On 19 October, it was announced that Australia frozen baked foods and desserts brand Sara Lee has called in administrators, hiring FTI Consulting to sell or restructure the Australian side of the business.

Sara Lee's Australian business was established in Lisarow, NSW, in 1971 and has a long history of producing home-grown desserts, including frozen cheesecakes, pies, crumbles and ice cream.

In 2021, New Zealand private equity firm South Island Office bought Sara Lee from McCain Foods for an estimated \$95 million. The firm later merged it with The Original Foods Baking Co.

FTI is now working with Sara Lee's management team and staff to continue operations, while commencing the process to sell or restructure the business.

Only the Sara Lee brand in Australia is in voluntary administration.



Blueberry sticker to slow ripening process being trialled

While blueberry harvesting is the full swing in Northern Hemisphere, the blue fruits business in both hemispheres may soon have an innovative tool for extending seasonality and reducing food waste.

The results of a recent trial conducted on blueberries after using novel technology indicated a slower ripening effect — with the treated blueberries being kept in good quality for the full 49 days of the test.

Vidre+ technology is a patented system for 1-MCP to begin release 1–2 hours after packaging and gradually release within the packaging itself over 30 hours via a simple-to-use sticker. The release of the product is triggered by humidity within the packaged product.

The technology is designed to protect ethylene — a gas and natural plant hormone that plays an important role both in ripening and fruit softening/degradation. It is already used in Argentina and is awaiting regulatory approval in key food production markets including the Americas.

The trials were commissioned by Fresh Inset and led by Dorota Wichrowska, PhD, from the University of Science and Technology in Poland during the summer season of 2022. Results have demonstrated the impact of Vidre+ technology on blueberries.

“Research underscores the potential of the Vidre+ technology, which can bring time management flexibility and the ability to deliver fresher blueberries across extended supply chain routes. The technology has demonstrated a positive impact on freshly harvested blueberries, which is marked by reduced weight loss, improved overall quality, extended fruit firmness and better retention of essential elements like Vitamin C and antioxidants,” said Tim Malefyt, PhD, CTO at Fresh Inset.

Blueberries treated with 1-MCP Vidre+ stickers are claimed to have lost less weight and kept better eating quality and firmness for a longer time compared to untreated ones.

Throughout the test period, the treated fruit exhibited a 2–3% reduction in weight loss compared to the untreated group. Treated fruits maintained excellent eating quality throughout 35 days of the experiment and kept very good eating quality for the full 49 days of the test. Untreated fruits began to soften after 21 days vs after 35 days for treated fruit. After 28 days in cold storage, treated blueberries had 83% more Vitamin C and 33% higher antioxidant levels.

Americold acquires temperature-controlled facility in Qld

Based in the US, Americold Realty Trust, Inc. has announced the acquisition of a temperature-controlled storage facility in Ormeau, Queensland, Australia. The facility is more than 59,460 m³ and has around 10,000 pallet positions, with the capability for future expansion.

“We are pleased to announce our acquisition of the Ormeau site, which expands our presence in the Queensland, Australia, market,” said Andrew Mates, Managing Director of the Asia Pacific Region at Americold. “This facility is strategically located adjacent to the Pacific Motorway

(M1), is halfway between Brisbane and the Gold Coast, with quick access to the Port of Brisbane, and has already received many expressions of interest from new and existing customers. This acquisition allows us to better serve our current customers and increase our customer base as we strive to fulfil our mission to help our customers feed the world.”

The acquisition will increase Americold’s presence in Australia to approximately 1.7 million m³, spread across five states and 12 sites.



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Pact Group forms reusable plastic crate joint venture

Pact Group has signed a \$160m deal for global infrastructure investment manager Morrison & Co to purchase a 50% stake in its Crate Pooling business. The Crate Pooling business, which is currently part of Pact's Reuse division, manufactures and manages an asset pool of reusable plastic crates (RPCs) and folding produce bins used by retailers and suppliers in Australia and New Zealand in their fresh produce supply chains.

The new strategic partnership will operate as an independent entity, with Pact retaining a 50% interest and continuing to drive the next phase of growth. The investment by Morrison values the Crate Pooling business at an approximate enterprise value of AU\$380 million.

Operating a network of wash and distribution facilities for RPCs used by retailers in Australia and New Zealand in their fresh produce supply chains, the business manufactures crates and bins in Australia and operates wash and distribution facilities that keeps them circulating in a loop across the supply chain.

Sanjay Dayal, Pact CEO and Managing Director, said the company has been seeing increased demand for its Crate Pooling offering, something which the partnership plans to accelerate with an expanded range of products and services.

The business has recently extended its crate pooling contract with Woolworths by 10 years and plans to scale up usage from 50 million to 80 million crates a year by 2025. It has also secured a long-term contract extension with ALDI Australia.

Mark Mudie, Partner at Morrison, said, "This is an attractive opportunity for our clients to gain exposure to the circular economy thematic, which aims to eliminate waste by keeping products and materials in use for as long as possible. We believe the circular economy can tackle some of our greatest social and environmental challenges, while unlocking economic value for our investors."

RPCs are 100% recyclable and reusable, with each individual crate capable of replacing up to 140 units of single-use packaging.

Completion of the agreement is expected later this year.



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Bega to acquire two Tasmanian dairy brands

Bega Group has announced it has signed an agreement to acquire two TasFoods brands.

TasFoods was established in 2015 to represent Tasmanian brands that use the state's natural resources for producing food and beverage products.

Meander Valley Dairy and Betta Milk, which were acquired by TasFoods in 2015 and 2019 respectively, are set to be acquired by Bega Group under the new agreement, which was announced to the stock exchange on 28 August 2023.

The \$11 million agreement also includes a licence to use TasFoods' Pyengana Dairy brand for milk and cream products in Australia.

The acquisition is subject to a number of conditions, including ACCC approval.



Anton Paar acquires German process engineering company

Anton Paar has acquired German company Brabender, which will be integrated into the Anton Paar Group as Anton Paar TorqueTec GmbH. The company, based in Duisburg, Germany, provides measurement and process engineering solutions for the testing of raw materials and for recipe and process development. It covers a wide range of applications — from food and feed to plastics and rubber, and even batteries and other special applications.

The signing of the acquisition agreement took place on 1 August 2023, with both parties agreeing not to disclose the purchase price. The companies have planned a smooth integration of Brabender into the Anton Paar Group, and products and services can be directly purchased via the Brabender website and sales organisation as before.

The Farinograph is Brabender's best-known instrument, developed by company founder Carl Wilhelm Brabender in 1928. It is mainly used in flour mills, by baking agent manufacturers and large bakeries.

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Family business upgrades its smoked meat manufacturing facility

Poachers Pantry (Poachers) smoked meats was established in 1991 by Susan and Robert Bruce on the family's property after identifying a gap in the local market for European smallgoods. Now in the business's 32nd year, their son, William Bruce, and his partner, Lauren Allen, are taking the reins and preparing the manufacturing facility for the next three decades.



Over the years, Poachers has supplied product to supermarkets, delis, restaurants across Canberra, Sydney and Melbourne, as well as product to the Qantas business class menus. In more recent years — in partnership with distributors Cartel and Co, Flavours Group, Harris Farm and Brindabella Foods — products

can be found across the east coast of Australia, down to Tasmania and more recently in Queensland.

The production facility lies in the heart of a working farm, just north of Canberra. It operates the Smokehouse Restaurant, weddings and events, a vineyard and wine label. The smoked meats and wine produced on the property can

be enjoyed by visitors to the restaurant.

In 2022, Poachers received a NSW Government's Regional Jobs Creation Fund grant, allowing the business to significantly upgrade the production facilities, including the purchase of brand new curing, cooking and smoking equipment from Germany, through CBS Food Tech in Sydney.



William Bruce at the smokehouse



Hand labelling chicken

The new equipment includes a new Henneken tumbler and injector, and two Reich Airmaster Ovens which will produce both hot and cold smoked meats.

The smoked meats manufacturer was previously limited with its production equipment when it came to curing products such as the nitrite-free bacon, taking up to two weeks and being smoked for

a further three to five days. With a bigger tumbler and the new smokehouses, drying and smoking and drying time will be reduced to 24–48 hours.

The contemporary Reich Airmaster smokehouses are designed to provide shorter, energy-efficient cooking and smoking cycles, increase load capacity, ensure consistency between batches all

while increasing yields across the business's product range.

Having 130 kW of solar on the property was a major factor in selecting the Reich electric ovens. Poachers produces 80% of its own power. The move to fully electric will see its gas consumption reduced by 90%.

Features of the ovens include: good performance, high load capacity, product consistency and high quality, faster process times, lower weight loss and digital monitoring to track batch cycles and temperature, as well as fulfilling HACCP reporting requirements which, to date, had been completed on paper-based forms.

Owner Andy Scherger's father was the one who installed the original Poachers smokehouse that started the business back in 1991 — a second-hand smokehouse from the local CIT (TAFE).

Now with this new equipment, paired with the existing packaging equipment — Ulma Thermoformer and Trief automatic slicer — Poachers is expected to double its existing production capacity.



A nose for food spoilage

While plenty of electronic noses, or artificial olfactory systems (AOSs), have been developed in the past, many have had limitations in terms of high energy consumption, time delays and data loss.

Now researchers have developed an energy-efficient computing-based chip with smell-sensing units that can detect food spoilage and provide real-time conditions continuously throughout the spoilage process.

The newly developed AOS requires minimal energy and integrates sensing and computing units on the same chip. It detects food spoilage by employing thin zinc oxide films that sense even very low levels of hydrogen sulfide and ammonia gases, which are high-protein food spoilage markers.

When investigators tested it during the spoilage process of chicken tenderloin, the system continuously tracked freshness scores and food conditions over time. The platform could be used for various applications by adjusting the gas-sensing materials and other parameters.

“Our artificial olfactory system is extremely energy- and area-efficient since the sensing and processing units are integrated and operate concurrently like a biological olfactory system,” said corresponding author Jong-Ho Lee, PhD, of Seoul National University.

The system is described in detail in a study published in *Advanced Science*.



Building the chicken meat workforce

With the average Australian now consuming 1 kg of chicken every week, the new AgriFutures Cultivate Traineeship Program aims to build the poultry workforce to help meet this demand.

AgriFutures has partnered with the chicken meat industry to launch this 12-month traineeship for people seeking an early career opportunity in this sector.

As well as achieving a Cert III in Poultry Production, successful participants will secure a full-time role in the industry, engage in professional development and mentoring and complete the program alongside a network of peers.

Executive General Operations Manager at Inghams Susy Klein said the company was proud to back the initiative.

“There are diverse career options in the chicken meat industry as it has a vastly different structure compared to other agricultural industries.

“Chicken companies directly provide farmers with one-day-old chicks, feed, veterinary expertise and farm management support, which creates an industry rich in opportunities to progress,” Klein said.

John Harvey, Managing Director of AgriFutures Australia, said the Cultivate Program is a unique pathway into the agricultural workforce that aims to catch the attention of those who may not have considered a career in the chicken meat industry before.

“With a new focus on strengthening the agricultural workforce, at AgriFutures we recognise that young people have a key part to play as future workers and leaders of the agricultural industry. We need to support them, listen to them and invest in their development,” Harvey said.

ACMF CEO Dr Mary Wu said this provides an entry platform for people to explore all the roles the industry has to offer while attaining a formal qualification and full-time job.

The program aims to highlight the chicken industry as one that holds a lot of potential for young people. Applications are open to people looking for an early career opportunity and no prior experience is required.

Using machine learning for staff retention in red meat industry

A challenge for the Australian red meat processing sector is retaining experienced employees. An AMPC research program has found that machine learning might make it possible to predict which employees are at risk of absenteeism or departure, so processors can actively manage staff to retain them for longer.

The project analysed HR data from a selected red meat processor and applied a machine learning model that used the data to learn from behaviours of past



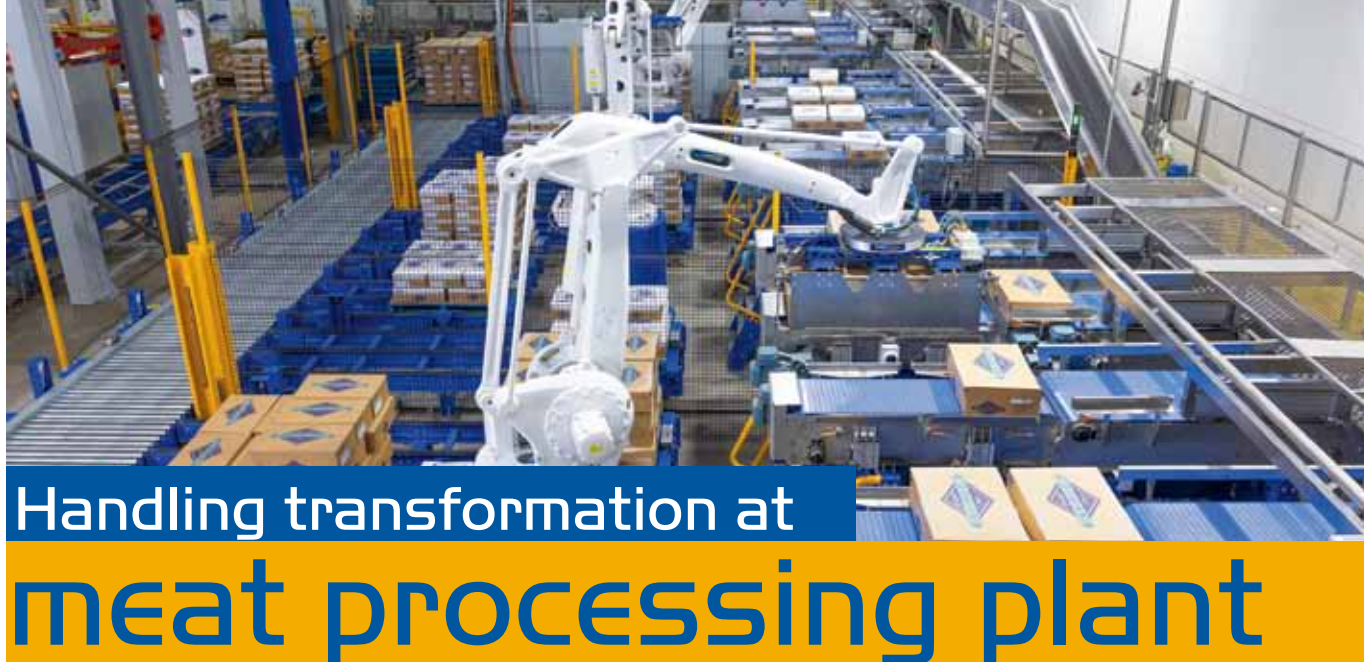
employees to help identify like patterns in current employees. It used data such as sick leave, leave type, days of the week leave was taken, pay scale and length of service.

AMPC Program Manager Amanda Carter said the model, if successful, might not only assist the processing sector but also have

carryover benefit throughout the rest of the red meat supply chain, contributing to a more globally competitive Australian red meat industry.

The research program concluded that the machine learning model is a viable tool for reducing turnover in red meat processing plants and it could be suitable for different plants with minor adjustments.

“Two plants have already expressed interest in potentially adopting the model in practice, and consideration is now being given to how an implementation trial might work and what would be involved in expanding the dataset,” Carter said.



Handling transformation at meat processing plant

Completion of a significant automation project has transformed the back end of operations at Midfield Group's meat processing plant in Warrnambool, Vic.

The MHM Automation solution has automated all processes after product is boxed and barcoded, taking it from boning room to pallet without any manual handling.

Cartons of meat are closed, frozen, sorted, tracked, stored, retrieved, palletised, wrapped and labelled by machines, all with minimal human intervention.

MHM General Manager Sales & Marketing Tony Johnson said, "This kind of process automation provides the answer to a range of challenges that processing plants are grappling with right now — from labour shortages to the need to reduce their carbon emissions."

Midfield Group's objectives for the upgrade included freeing up space for further processing expansion, reducing its reliance on manpower, having the ability to effectively manage inventory for production and sales, and reducing its overall energy consumption.

After consultation with Midfield, MHM Automation proposed a custom-designed solution comprising a six-mag ladder, four SSO plate freezer stacks, two automated storage and retrieval systems (ASRS) and a three-cell robotic palletising system.

The project was delivered in stages over three years, culminating in the commissioning of the ASRS in June 2023.

The ASRS

Delivered by MHM in collaboration with its European technology partners TGW and Inther, the ASRS automatically sorts incoming cartons from the production

line by SKU. It then transfers and stores them in a space-efficient racking system and retrieves them on demand to assemble rainbow pallets to fulfil individual customer orders.

Two ASRS systems were installed at Midfield — one for chilled and one for frozen meat products.

"With the ability to deal with a high volume of products in constant motion, the ASRS streamlines the movement of goods in and out of storage effectively and efficiently. It is ideal for plants producing large numbers of SKUs and needing to combine those products into custom pallets to meet customer requirements," Johnson said.

The ASRS provides many benefits, including comprehensive inventory management and seamless integration with production and sales management systems. Its high-speed elevators and live shuttle system enable efficient order picking. Notably, it is designed to eradicate manual handling concerns and ensure good traceability.

While ASRS systems are commonly used in warehouses to handle pallets or cartons of dry goods, MHM's system is relatively unique in its ability to operate in chilled and frozen environments.

"This makes the technology ideal for food processors," Johnson said. Other equipment in the system also delivered important improvements to Midfield's operations.

The installation of the ladder and plate freezers in 2021 amplified the plant's freezing capacity to approximately 25,000 cartons per day.

Designed to meet stringent export food safety requirements with its 24-hour freeze time, MHM's plate freezers also deliver significant energy savings of up to 30% compared to blast freez-

ing. Contact freezing between plates is designed to ensure the frozen cartons are completely flat, which was important to enable integration with the ASRS and automated palletising system at Midfield.

Added in 2022, the palletising system alleviated labour requirements, which were proving difficult to fulfil in a stretched labour market. It mitigated health and safety hazards associated with manual handling of heavy meat cartons and also introduced automation to pallet scanning and Meat Messaging label generation, eliminating the need for manual port marking.

The automation solution delivered includes:

- Six-mag carton ladder — automatically places and seals lids on cartons.
- Single station opening (SSO) plate freezer — four stacks, each with capacity to freeze 3072 cartons in 24 h.
- Automated storage and retrieval system (ASRS) — one for chilled products and one for frozen products.
- Three-cell robotic palletising system (pictured at top) — includes auto-check scanning, stretch wrapping and labelling.

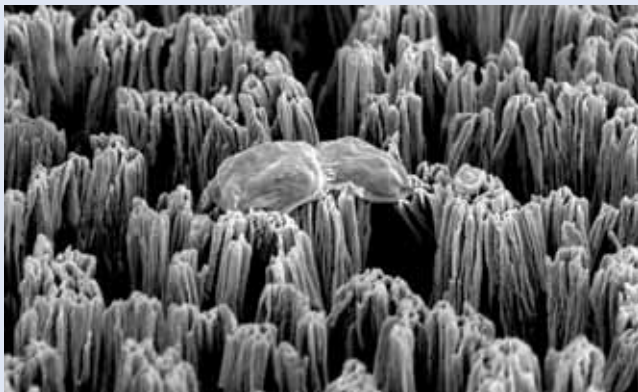
Midfield Group CEO Dean McKenna said the project's success was the result of a trusted partnership.

"At Midfield Group we are committed to providing superior products and reducing our environmental footprint. We strive to be ahead of the curve when it comes to introducing new technologies that help us achieve those goals.

"MHM Automation understands our goals and works with us to achieve them. We particularly value their ability to provide an integrated, end-to-end solution. They have delivered everything they promised, and more," he said.

MHM Automation
mhmautomation.com/

Bacteria-killing spikes could be used in food production



An RMIT University study has suggested that rough surfaces inspired by bacteria-killing spikes on insect wings may be more effective at combatting drug-resistant superbugs, including fungus, than previously understood.

RMIT scientists have designed a pattern of microscale spikes that can be etched onto titanium implants or other surfaces to provide drug-free protection from bacteria and fungus. It could also have applications for stainless steel benches used in food production and agriculture.

The study, published in *Advanced Materials Interfaces*, tested the effectiveness of the altered titanium surface in killing multidrug-resistant *Candida* – a potentially deadly fungus responsible for one in 10 hospital-acquired medical device infections.

The specially designed spikes, each of a similar height to a bacteria cell, destroyed about half the cells soon after contact. Significantly, the other half not immediately destroyed were rendered unviable from the injuries sustained, unable to reproduce or cause infection.

The surface's effectiveness against common pathogenic bacteria including golden staph was demonstrated in an earlier study published in *Materialia*.

Group leader Distinguished Professor Elena Ivanova said the latest findings shed light on the design of antifungal surfaces to prevent biofilm formation by dangerous, multidrug-resistant yeasts.

“The fact that cells died after initial contact with the surface — some by being ruptured and others by programmed cell death soon after — suggests that resistance to these surfaces will not be developed,” she said.

“This is a significant finding and also suggests that the way we measure the effectiveness of antimicrobial surfaces may need to be rethought.”

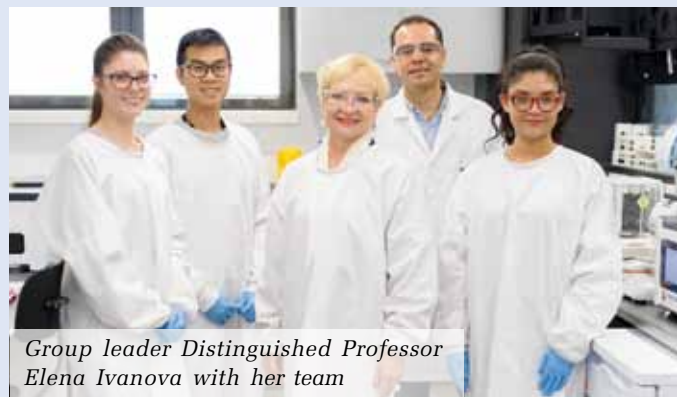
Advances have been made over the past decade in designing surfaces that kill superbugs on contact. However, finding the right types of surface patterns to eliminate 100% of microbes so some don't survive to become resistant is an ongoing challenge.

“This latest study suggests that it may not be entirely necessary for all surfaces to eliminate all pathogens immediately upon contact if we can show that the surfaces are causing programmed cell death in the surviving cells, meaning they die regardless,” she said.

RMIT's Multifunctional Mechano-biocidal Materials Research Group has been developing antimicrobial surfaces inspired by the nanopillars covering dragonfly and cicada wings for over a decade.

Ivanova's team has spent the past decade replicating these nanopillars, with this latest advance achieved using a technique called plasma etching to create the antibacterial and antifungal pattern in titanium.

The technique could also be optimised and applied to a range of materials and applications, such as the stainless steel benches used in food production and agriculture.



Group leader Distinguished Professor Elena Ivanova with her team



Real-time temperature, RH and light data logger

OneTemp has introduced the tempmate-GS2, an all-in-one solution for monitoring temperature, relative humidity, light incidence and location in real time. This single-use data logger offers LTE 4G connectivity for smart logistics worldwide. In addition to providing an overview of the user's shipment status at any time with its LCD, the logger gives users the flexibility to choose from three different devices with a lithium or lithium-free battery for varied application areas and multimodal transports. The simple configuration option also allows users to generate individual reports for their transport routes and up to three device stop/starts.

Moreover, the device is designed to reliably record extremely high or low temperatures as well as live monitoring with the free tempmate cloud software for total transparency in the user's supply chain. In addition to regular data uploads with customisable intervals and automatic alarms for temperature excursions, offline reporting is also available via USB download.

The device is suitable for applications in food and beverage manufacturing, cold chain logistic companies or anyone looking to monitor their products in storage and during transit throughout across the world.

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Cold chain improvements using warehouse automation

The frozen food and cold supply chain industry is facing increasing challenges, with many companies in Australia and New Zealand struggling to keep up with rising energy costs, labour shortages and other issues.

At the 2023 Refrigerated Warehouse and Transport Association of Australia (RWTA) Conference on the Gold Coast, Sean Ledbury, Swisslog Head of Sales and Consulting, and Charles John, Swisslog Senior Sales Consultant, discussed how to overcome these challenges and maximise the operational footprint of a cold chain with warehouse automation.

According to Ledbury, one of the biggest challenges companies are facing is labour shortages. "Low temperatures make refrigerated warehouses harsh environments, where it is recommended that humans should spend minimal time to avoid hypothermia and other health and safety risks. Using automation to do tasks in freezer areas removes workers

from these harsh environments, freeing them up to work in other, more suitable areas," he said.

The cold chain industry is also facing other challenges including changing customer demands, new compliance regulations and energy consumption. Food production is facing increased challenges too, with water scarcity, soil degradation, deforestation and reduction in farmers all playing a part in making the supply chain more complex.

According to John, an automated high-bay chilled warehouse can reduce energy loads by up to 20% compared with conventional alternatives, reducing the energy bill and allowing for more storage within the same building footprint, maximising available space.

"Not only does it reduce the power bill, but it typically allows for four times more storage within the same building footprint, so you are maximising your use of the available space," he said.

"This is becoming increasingly important, as industrial land continues to become more expensive in major cities across Australia and New Zealand. Adding capacity without having to purchase a new site can make for a superior ROI."

In the cold chain, compliance is essential due to the harsh nature of chilled and deep freeze environments and the

strict requirements food and beverage products need to adhere to.

Automation can help meet compliance regulations in a number of areas, such as:

- Providing automatic doors with airlocks to efficiently separate the storage area from the shipping area.
- Making sure the cold chain is respected from production to shipping.
- Providing an automatic connection with the production area and the shipping buffer in deep freeze temperatures.
- Creating a cleaner, safer environment, by not needing to use ice.
- Better goods management process and error-free traceability through advanced software.

"Software such as Swisslog's SynQ can optimise warehouse operations and deliver a range of benefits. It can control order planning, order picking, consolidation, shipping, storage, receiving and putaway, and the benefits extend beyond these tasks, too," Ledbury said.

SynQ is a Swisslog software that synchronises people, process and machines for efficient operations. It is a warehouse management system that can perform the task of a warehouse control system or a material flow system. It can also interact with enterprise resource planning and e-shop systems.

"In a cold environment, SynQ can control the placement of products, to make sure the right temperature is always maintained for optimum product integrity," Ledbury said.



Stainless steel panel PC

Interworld Electronics has released the PhanTAM-921C series of rugged, stainless steel panel PCs from APLEX Technology. The PhanTAM-921C series improves on previous solutions, with an updated Intel 11th Gen. Core i3(Dual Core)/i5(Quad Core) processor, ultra-slim front frame design, landscape or portrait mode, and waterproof antenna covers, which removes the risk of bending/breaking antennas.

The PhanTAM-921C series offers a highly protective panel solution, going beyond the basic standard, by achieving IP66 and IP69K-certified protection with M12 connectors. The 304 (or optional 316) fully enclosed stainless steel chassis of the series makes it a good solution for the food and beverage manufacturing industry due to its slim design, high corrosion resistance, and germ resistance, helping to prevent any bacterial contamination. The use of stainless steel for the chassis also makes it easy to clean (capable of withstanding high-pressure cleaning), increases the life cycle of the chassis due to its rugged nature and helps to lower the cost of maintenance.

The series features a 21.5" TFT-LCD display and includes two USB, one serial and one LAN port, as well as the ability to add additional ports, Wi-Fi and RFID. The addition of waterproof antenna covers enables companies to make use of a range of antenna options (4G LTE, 5G, BT and Wi-Fi).

The PCAP touch screen with 7H anti-scratch surface and optional high brightness helps to improve usability and makes it adaptable to a range of environments.

Interworld Electronics and Computer Industries

www.ieci.com.au



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Mechanical safety gate systems with guard locking

In addition to the standard safety switches PSENmech, Pilz is now offering mechanical safety gate systems PSENmech with guard locking. Thanks to its metallic head, in comparison with its predecessor PSENme1, the new generation of the safety gate system PSENmech with guard locking — PSEN me5 — has greater robustness and can also be combined with an escape release or emergency release.

PSEN me5 provides an economical basic solution for the safe monitoring of movable guards. The safety gate is safely locked until the hazardous machine movement stops. An unintended startup of the hazardous movement is prevented. As a result, the solution is suitable for protecting personnel and processes and can be used in numerous industries and applications. It can be supplemented with an escape release or emergency unlocking device. Together with the configurable safe small controllers PNOZmulti 2, it can serve as a cost-effective, complete, one-stop solution.

Benefits include: the economical basic solution for safety gate monitoring with safe guard locking; suitable for accessible doors thanks to escape release and emergency unlocking device options; flexible and fast installation thanks to various actuators and an M12 connection; long product service life thanks to the head and the 3D actuator being made of metal; housing is insensitive to dirt and dust and is also waterproof; suitable for connection to decentralised modules such as PDP67 or PSS67 thanks to M12, 5-pin product variants; and safe complete solution, eg, with configurable safe small controllers PNOZmulti 2.

Technical features include: position monitoring of movable guards in accordance with EN 60947-5-1; designed for applications to PL e of EN ISO 13849-1, SIL CL 3 of EN/IEC 62061 (two devices must be used for the maximum requirements); holding force: 1500 N, type of guard locking: magnetic force, spring force; extraction force: <10 N; directions of actuation: 5; protection type: IP67; supply voltage: 24 VAC/DC, 110 ... 230 VAC, with M12 connection only 24 VDC.

Pilz Australia Industrial Automation LP
www.pilz.com.au

Multiphase wastewater solutions

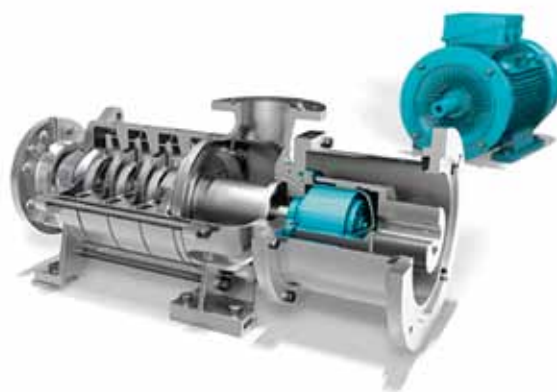
The EDUR-Multiphase Pumps are engineered for use with water and wastewater technology, as well as various industrial sectors.

The versatile pumps have typical application in dissolved air floatation plants, where they produce large quantities of micro-bubbles without the need for a compressor or air saturation (pressure) vessels.

The capabilities of multiphase pumps lie in their ability to handle liquid-gas mixtures, making them suitable as DAF pumps. EDUR engineers have designed pumps with balanced impellers to enable handling of air and gas without damaging the pump.

Advantages include: improvement in energy consumption (because they don't need compressors); improvement in maintenance costs; no pressure vessel to certify; no compressor to maintain; and no complicated control system to operate.

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Hygienic butterfly valve

The AWH leakage butterfly valves, compact intermediate flange butterfly valves and standard butterfly valves are designed to be suitable for safe media separation.

Butterfly valves are used for controlling the flow of fluid through pipes. They are multipurpose and offer a compact design, making them a good choice for the food and beverage and pharmaceutical industries (among others). They are suitable for applications involving liquid or semi-liquid products.

Within hygienic industries, along with all equipment, valves must adhere to the strictest sanitary standards, which means sourcing the right valves for the job is imperative. There are several factors to consider when selecting a butterfly valve. Firstly, the sealing must be food grade and durable, with no potential for leakage to avoid being contaminated and it should be made of a material that isn't affected by the chemicals within the clean in place (CIP) cycle. Adequate seal technology will ensure the butterfly valve is longer-lasting in demanding conditions. A compliant butterfly valve is safe for use with food and in food production processes. 316 stainless steel butterfly valves are essential.

All of AWH products are made from high-quality, traceable stainless steel that is durable. A variety of test certificates and documentation is available on request.

Cleaning of AWH valves is simple and efficient due to their design. The valves are completely isolated when in the closed state. The valve closing pistons lie almost flush in the through-flow pipe. This prevents contamination at this point.

The double-flap principle is designed to ensure the highest possible safety of media separation in a pipeline system.

Only high-quality AWH valve seals are installed in the butterfly valves.

AWH Valves also have an optional RFID transponder to store all of the necessary data around the valve.

Valves can be equipped with pneumatic or electric actuators in just a few steps. There is also the option of retrofitting the actuator and auxiliary valves with initiators. These enable monitoring of the individual valve positions.

German-manufactured AWH hygienic butterfly valves are now available through Tecpro Australia.

Tecpro Australia

www.tecpro.com.au



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Coffee conveyed from bulk bags to roaster to packaging



Mayorga Coffee produces 30 different coffee roasts and supports local organic farming methods by working directly with small, family-owned coffee growers in Mexico, Bolivia, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Peru.

“We produce a product that is sustainable, not only for the planet, but for the people growing it as well,” said Erin Dall, President and COO. Mayorga sees its direct purchases, without complex supply chains, as an important factor to reducing poverty in Latin America.

Founded in 1997 and headquartered in Rockville, Maryland, the company until recently operated a 3900 m² roasting and packaging facility in Miami, Florida to produce its premier product, Café Cubano Roast organic coffee, in vacuum-sealed brick packs.

To transfer the coffee beans from roaster to grinder to packaging line, the company installed a bulk handling system comprising two bulk bag dischargers, three flexible screw conveyors and a bulk bag filler, all from Flexicon Corporation.

Roasted coffee beans are discharged from the roaster into open-top bulk bags and delivered to a BFF BULK-OUT bulk bag discharger. A forklift then positions a bag-lifting frame immediately above the bag, allowing an operator to slide the bag's four lifting straps into Z-CLIP strap holders, and the forklift to lift the frame—with suspended bag—into receiving cups atop the discharger's frame posts.

The discharger houses a bulk bag spout interface chute with an integral access door. With the bulk bag in position, the operator opens this door to gain access to the bulk bag spout tie. Once the spout has been untied, the access door is closed while roasted beans are discharged from the bulk bag.

Conveying of whole and ground beans

The beans flow from the bulk bag into a 226 L floor hopper, which charges a 4.57 m model 1350 flexible screw conveyor inclined at 45° to feed the grinder. The 90 mm diameter enclosed conveyor tube is designed to prevent product and plant contamination. The inner screw is the only moving part contacting material and is driven by an electric motor positioned beyond the point at which coffee beans exit the conveyor, preventing material contact with seals.

From the grinder, ground coffee gravity discharges into a 113 L floor hopper that charges a second 4.6 m long, 90 mm diameter flexible screw conveyor, this one equipped with a

To transfer the coffee beans from roaster to grinder to packaging line, the company installed a bulk handling system comprised of two bulk bag dischargers, three flexible screw conveyors and a bulk bag filler, all from Flexicon Corporation.



spiral designed to efficiently propel the fine-ground material to a Flexicon model BFB bulk bag filler.

A palletised open-top bulk bag is placed inside the filler frame, which can be adjusted to accommodate bulk bags ranging from 914 to 1828 mm high. Strap hooks, mounted on each of the four corners of the fill head, hold the bag open and stabilise it during filling.

Feeding the packaging line

Filled bulk bags are forklifted into a second discharger which unloads coffee into a 226 L floor hopper charging a 4.7

m long, 51 mm diameter flexible screw conveyor to feed the packaging line.

Low- and high-level sensors on the packaging machine hopper signal the system's PLC when to start and stop the conveyor.

Dall said the bulk handling system improves productivity and plant cleanliness. "Flexicon provided a solution that fits within our space limitations, allows immediate packaging and provides for future production expansion."

*Flexicon Corporation (Aust) Pty Ltd
www.flexicon.com.au*

NEWS

\$3bn multi-beverage partnership launched

Beam Suntory and Frucor Suntory have launched Suntory Oceania — a new AU\$3bn multi-beverage partnership across the premium spirits and non-alcohol segments in both Australia and New Zealand.

Under Suntory Oceania, Beam Suntory and Frucor Suntory will create the fourth-largest ANZ beverage group in Oceania with full end-to-end control of its portfolio, including manufacturing, sales and distribution.

The partnership is set to be operational by mid-2025 in Australia and 2026 in New Zealand.

Frucor Suntory CEO Darren Fullerton said, “This new venture is all about bringing the best of Suntory to Oceania. With the ability to accelerate our growth trajectory, we strongly believe it will redefine market dynamics and offer more consumer beverage moments from sunrise to sunset, unlocking innovation for our customers across retail and hospitality industries.”

Mark Hill, Managing Director of Beam Suntory Oceania, commented, “This collaboration demonstrates our belief in the growth potential of the Australian and New Zealand markets. When other businesses are pulling back, we are forging ahead, bringing Suntory’s spirit of bold ambition to life.”

The catalyst for Suntory Oceania’s growth will be its \$400 million facility currently being built in Ipswich, Queensland, with support from the state government. The facility is on track to be operational in mid-2024 with the ability to produce 20 million cases on start-up and over 50 million cases in the future. The additional beverage processing, packaging, warehousing and distribution will complement current manufacturing operations in Auckland.

Fullerton added, “The new site sets the industry standard in terms of investment into sustainable technologies to drive efficiency and minimise our carbon footprint. We are looking at a multi-pronged strategy through a CleanCo solar power purchase agreement, over 14 km of solar panels onsite, biomass boiler and state-of-the-art production equipment.”

Suntory will be expanding the current workforce and hiring over 400 roles as the partnership comes to life from mid-2025.

“We are immensely grateful for our long and successful relationship with Coca-Cola Europacific Partners, which will continue through to 2025,” Hill said. “With Suntory Oceania, we are looking to the future with optimism and a wholly owned platform from which to build the long-term growth of our brands for years to come. It is the perfect opportunity for us to build upon the strength of Suntory as the global leader across the beverage sector.”

Further work to establish the partnership will occur over the coming year with each partner, Beam Suntory and Frucor Suntory, retaining its own distinct legal entity.

For more information about Suntory Group, visit www.suntory.com.



Air nozzles

EXAIR’s Super Air Nozzles offer an efficient way to blowoff, cool, dry and clean. Many designs are available to suit different applications. The nozzles are designed to have compressed air savings as high as 80% when compared to typical blowoffs like open pipe and tube. The noise level is a fraction that of ordinary air nozzles (typical noise reduction is 10 dBA).

Many nozzle designs are available in zinc aluminium alloy construction for general-purpose applications. They are also available in Type 303 or Type 316 stainless steel construction for food and pharmaceutical applications where resistance to high temperatures and corrosion is required. Models are also available in PEEK (plastic) construction to provide non-marring protection to production items as well as resistance to damage from harsh chemicals. Stay Set Hoses, Magnetic Bases and Swivel Fittings are available for easy positioning, and an electronic control to minimise air usage is also available. EXAIR Safety Air Guns incorporate Super Air Nozzles for improved safety and blowoff performance.

Standard force Air Nozzles and Jets deliver force up to 624 g. High force models are now available that deliver force up to 10,433 g for applications where additional reach and extreme force is needed. All EXAIR Safety Air Nozzles and Jets meet OSHA noise level and pressure requirements, are CE compliant and can help to reduce compressed air costs on blowoff operations. The airflow that exits the Super Air Nozzles cannot be blocked, as required by OSHA standard 1910.242(b); so, all are safe to use at higher pressures.

Applications include ejecting parts and slugs, chip removal, part cleaning, drying, liquid blowoff and cooling.

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CASE STUDY

Nestlé Australia has invested \$2 million in new technology designed to reduce water use in its Gympie factory, which has been operating since 1953. Described as the home of Nescafé, the factory produces more than 20 million cups of coffee every day — or 230 cups every second.

The new technology is designed to cut Gympie factory's water use by around 20%, saving 45 million litres each year.

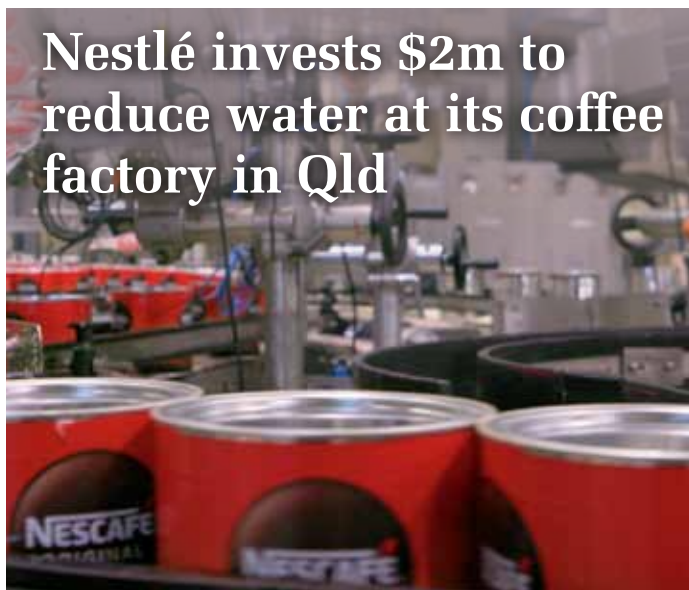
The water savings are the result of a newly installed treatment and filtration system which allows used water to be recycled onsite, instead of fresh water from the town supply.

Steve Taljaard, Factory Manager, said, "Making coffee uses a lot of water, so finding ways to reduce our water use is a priority.

"Our new treatment system captures and recycles the water used in the coffee-making process — and that recycled water is then used in our site's cooling towers."

Previously, all water used in the factory was drawn from the local town water supply and directed to the local water treatment plant.

Nestlé invests \$2m to reduce water at its coffee factory in Qld



"Our new filtration system will help us to save water but also deliver back to the local community," Taljaard said.

"It reduces the amount of local water we use, reduces the amount of used water that needs to be treated by Council, and reduces pressure on local water supplies, especially during drier seasons."

The water savings project builds on various initiatives the factory has implemented to improve its environmental performance, as it aims to

reach net zero by 2050, including:

- using 100% responsibly sourced coffee beans in all its products;
- using renewable sources for over 80% of the factory's energy needs, from waste coffee grounds, sawdust and wind;
- sending zero waste to landfill for the past 3 years.

Over the past five years, more than \$20m has been invested in the factory, which exports approximately 12,700 tons of coffee each year, predominantly to New Zealand and PNG.

CASE STUDY

The technology behind 3D-printed meat alternatives

Redefine Meat has created a 3D printer for plant-based meat that incorporates technologies from ViscoTec. Redefine is using the device to print alt meat that stays true to the texture, taste and chewing experience of beef. It is able to produce about 10 kg of the alt meat per hour, with plans to upscale.

Obviously, the exact recipe is a closely guarded secret, but once all the raw materials for the product are mixed, the result is a viscous liquid that carries challenges in dosage. Complex dosing geometries are used to extrude long threads of the fibrous material into thin webs. Many



layers of these sheets on top of each other result in a piece of alt meat.

The VHD Hygienic Dispenser helps in mastering the dosing task. The independence of viscosity dosing technology — in a range of 1–7,000,000 mPa — enables a uniform, low-pulsation discharge of the material. The pressures required are achieved by a multi-stage dosing geometry. The VHD has also been specially adapted to better integrate into an automated cleaning process.

Once the printing process is complete, the alt meat is portioned and packaged.

ViscoTec
www.viscotec.com



Growing Demand for Chilled and Frozen Food Storage in Australia Drives Americold's Expansion

As the demand for cold and frozen food storage reaches new heights in Australia, Americold, a global leader in temperature-controlled warehousing and logistics, is ramping up its operations through site acquisitions and expansions to meet the growing needs of the market.

The Australian market has witnessed a significant surge in demand for chilled and frozen food storage solutions in recent years. Factors such as changing consumer preferences towards fresh and frozen produce, increasing population, and the rise of e-commerce have contributed to the need for reliable and efficient temperature-controlled storage infrastructure across the country. "We have noticed a shift in the supply chain from a just-in-time, to a just-in-case model," said Andrew Mates, APAC Managing Director at Americold. "Our customers are holding far more stock than they have previously and this also adds to demand."

Americold is a global leader in temperature-controlled logistics and storage solutions and has more than 120 years' experience with 250 sites globally. The company operates in North America, APAC, Europe and South America regions and is committed to helping their customers feed the world. With more than 35 years' experience in the Australian market, Americold works closely with the major supermarket retailers, food producers

and manufacturers and the Quick Serve Restaurant chains. It provides a range of niche services such as pick to carton, date coding, product tempering and is picking hundreds of thousands of cases per year across their 14 sites in Australia, which are spread across five states. It also works closely with the meat sector in Queensland and Western Australia with blast freeze and export services.

"Americold is at the forefront of meeting the increased demands through our growth strategy plans and constant surveillance of the market and their needs," said Mates. "We are proud to be expanding our operations in Australia, with the recent acquisition of a new site at Ormeau in Queensland bringing our capacity to over 70,000 pallets in the state."

Americold has also commenced receiving product into their \$65M automated building in Spearwood, Western Australia. At 48-metres-high, the building is the tallest ASRS (Automated Storage Retrieval System) temperature-controlled facility in the West. The new installation will help to ease the food storage issues in the region.

Americold's continued commitment to expanding its footprint in Australia underscores its dedication to providing exceptional cold storage solutions for their current and potential customers. "Australia is underserved in the temperature-controlled space, and we need to keep growing and

developing at pace. We have land available at a few of our sites that could be used for future expansion," said Mates.

By choosing Americold, customers can benefit from the company's deep industry knowledge, advanced technological capabilities, such as their i-3PL inventory management system that provides customers with real-time visibility to their inventory and performance metrics, and a comprehensive suite of value-added services. With a focus on innovation and sustainability, Americold strives to optimize their operations and reduce environmental impact through measures such as energy-efficient infrastructure including the commitment to solar panel installations at their sites.

As the demand for chilled and frozen food storage rises in Australia, and across the globe, Americold stands ready to meet these requirements with its extensive capabilities and global industry leading expertise. With a strong commitment to customer service, Americold continues to be the preferred choice for temperature-controlled facilities.

For more information on Americold and its services, please visit <https://info.americold.com/anz-temp-supply-chain>


Americold
www.americold.com.au

CASE STUDY

12,000 new pallet spaces for CCEP Mentone DC

PROCESSING



Swisslog Australia has extended its automation solution for Coca-Cola Europacific Partners (CCEP) in Mentone.

CCEP is one of the largest bottlers of non-alcoholic beverages in the Asia-Pacific region and has partnered with Swisslog to enhance production capacities and deliver efficiencies through automation technology across multiple sites.

To eliminate the need for off-site storage during peak months, Swisslog has installed additional Vectura cranes at the distribution centre (DC). It has also installed an extended, \$17.4m automated storage and retrieval system (ASRS) solution to enhance operational efficiency, improve customer responsiveness and allow both software and mechanical upgrades with minimal impact to the DC's performance.

Colin Macdonald, CCEP Director of Operational Excellence Supply Chain – Asia Pacific, said Swisslog understood the needs of the business and adapted the application to its requirements.

"The expanded automation solution enhances safety, eliminates off-site storage and increases our customer responsiveness, which are all important as we look to further optimise production," Macdonald said.

Swisslog's solution is data-driven and robotic, enabling CCEP to optimise operations even in peak periods. The addition of more infrastructure in Pallet Flow Lane (PFL) dispatch lanes and additional Roll On Roll Off (RORO) docks will enable more efficient turnaround times for trucks inbound from CCEP's production facility at Moorabbin and outbound from Mentone.

The extra wrapper and manual infeed positions will allow for greater flexibility in operation of the warehouse.

Dan Ulmamei, Swisslog Managing Director, Australia and New Zealand, said, "CCEP is clearly committed to improving its operational efficiency, and it saw that further automation could help take it to the next level. Swisslog was delighted to be able to assist as CCEP's automation partner."



The new ASRS is joined to the existing one at crossover positions, allowing the entire system to be operated as a whole. A mix of a 3-pallet deep channel on one side and an 8/9-pallet deep channel on the other side creates a good mix of shallow and deep channel storage, with more than 12,000 total storage locations. Overlapping row carrier functionality has been provided as an option to improve storage utilisation.

"The extended automation solution at CCEP Mentone has been designed to allow the flexibility to upgrade any component in the future. The additional three cranes provide further redundancy for the Mentone DC," Ulmamei said.

The solution can be operated as a standalone ASRS or as a part of an integrated solution with the existing ASRS. With the ASRS capable of functioning as a standalone system, the existing ASRS can be taken offline for upgrades. This will allow CCEP to upgrade existing systems with minimal impact on operations.

Swisslog Australia
www.swisslog.com.au

X-ray machines **VS** metal detectors

Often seen as competing technologies, Fortress Technology has highlighted that food metal detectors and food X-ray machines have a single ‘quality control’ goal — detecting contaminants. Both have a place on food production lines and can strengthen food safety when used together.

Among growing demand for both technologies, Fortress is adamant that each technology has its respective strengths and limitations.

Metal is the most common high-risk contamination culprit, often caused by fragments that break off during mechanical cutting, blending and processing operations. Each sector has its own set of more prevalent risks — for example, bones and teeth in meat and poultry or stones and seeds in fruit and vegetable applications. There are also human PPE risks from hairnets and masks.

According to European Managing Director Phil Brown, X-ray machines can identify denser contaminants like glass, ceramic and bone, but there are certain metals they cannot detect in food products, which are visible to metal detectors. These include lightweight foil strips found in PPE and very thin box blades.

The performance and efficiency of production equipment is a key consideration to food processors. Aside from the up-front price, Fortress reports that the most overlooked cost is the maintenance, calibration and testing of X-ray equipment. Usually, this is minimal with metal detectors.

Metal detectors do not contain any heat sources and can quickly be repaired by maintenance teams, whereas X-ray machines usually cannot be repaired in-house due to safety concerns.

X-ray machines are typically located towards the end of the processing line, often after packaging, whereas metal

detectors can be used for in-process inspections as well as end-of-line checks.

The lifespan of X-ray machines can be shortened by water, dust, heat and cold temperatures, and as such, the machines are rarely deployed upstream in bulk, farming, gravity, ingredient or raw processing areas in a food production factory. Metal detectors can withstand more challenging environments, including flour and rice mills, as well as snack gravity applications where product is moving through an aperture at very high speed.

X-ray machine with acrylic windows

Modern food X-ray machines are designed to shield operators from harmful exposure to X-rays. Fortress X-ray units, for example, contain high-density acrylic windows with interlocked doors. Training staff regularly is still critical, however, to ensuring all operatives are following the correct safety precautions. There are strict regulated radiation leakage and dosage limitations when using a food inspection X-ray.

“Every technology advancement helps to build a safer food environment for all, protecting consumers and suppliers. Previously, it might have been harder to justify the cost of having both inspection technologies on a single line. However, given that even the best systems are not infallible, there are certainly occasions where have both metal detection and X-ray could be warranted,” Brown said.

Fortress Technology can provide food processors with a service that tests products on both a metal detector and X-ray system, presenting them with detailed reports and analysis to help with decision-making.

Fortress Technology Inc.
www.fortresstechnology.com

Mozzarella under the microscope

What makes a traditional Italian cheese, buffalo mozzarella from Campania, so special? The ingredients are simple: water buffalo milk, rennet and natural whey starter, processed using fresh water and brine. But

the natural whey starter contains microbes that are crucial to developing the mozzarella. Scientists from Italy used high-throughput 16S rRNA amplicon sequencing, which gives a detailed picture of what microbes are present and in what proportions, to understand how microbes make mozzarella.

“This study sheds light on the intricate interactions of microorganisms throughout the manufacturing process and fosters a deeper understanding of the craftsmanship behind this esteemed Italian cheese,” said Dr Alessia Levante of the University of Parma, lead author of the study which has been published in *Frontiers in Microbiology*.

Mozzarella di bufala Campana has been protected under EU law for nearly 30 years. To qualify for protected designation of origin (PDO) status, buffalo mozzarella must be made according to a specific recipe. Raw or pasteurised water buffalo milk is heated and inoculated with rennet and natural whey starter. This starter causes the curd to acidify quickly, bringing it to the right pH and making it stretchy enough to be moulded. The curds that form are ripened for about four hours until they reach the correct pH, when they become elastic and can be stretched and moulded under boiling water. These curds are then hardened under running water and brined. Minor variations in this procedure make the difference between the products of different dairies.

To investigate the role of bacteria, and whether this varies between traditional dairies and more modern ones, Levante and her team selected two dairies in Campania that produce mozzarella which qualifies for PDO status: one larger and using more modern technology, one smaller and using more traditional processes. They took samples of the dairies’ milk, natural whey starter, cheese curd before stretching, brine and mozzarella.

“While both dairies produced PDO mozzarella di bufala Campana, subtle variations, such as temperature and duration of processes, influenced the cheese’s microbial composition

and potentially impacted organoleptic properties,” Levante said.

19 samples were concentrated enough to perform 16S rRNA amplicon gene sequencing. This works by sequencing the DNA of a sample and amplifying spe-

cific regions of a highly variable gene, then using this data to identify the microbe species present and the proportions they appear in. The team found that the pasteurised milk used by the more modern dairy added fewer microbes and species of microbes to the process than the thermised milk used by the more traditional dairy, but that the brine samples were as rich in species as the processed cheese samples. During the curd process, a small number of species develop and take over.

Both samples were dominated by microbes from the *Lactobacillus* and *Streptococcus* genera. The natural whey starter from the more traditional dairy had roughly equal abundance of both, while the more modern dairy used a natural whey starter dominated by *Streptococcus*. Some species within each genus were specific to each dairy. After curdling, in both sets of samples, *Lactobacillus* increases and *Streptococcus* drops, possibly because the thermal stress caused by the stretching process has been removed.

The brine also offers a source of microbial diversity: it inoculates the external layer of the cheese with new microbes as it touches the cheese surface. However, not all the microbes in the brine appear in the cheese. This may be because they are not suited to living on the cheese or because they develop later in the cheese’s shelf life, after the samples of cheese were taken. Despite the large number of species of microbes available in the milk and the brine, it seems that the microbial make-up of mozzarella is most influenced by the natural whey starter.

“We are planning a larger project to investigate more deeply the role of raw buffalo’s milk in defining the microbiota,” Levante said. “This study’s scope was limited to two dairies and a specific sampling size. To provide more comprehensive insights into the microbial intricacies of traditional food production, future research aims to encompass a larger number of producers and manufacturing days.”



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Efficiency key as juice producers squeezed

Matt Hale, International Sales & Marketing Director, HRS Heat Exchangers

PROCESSING

Orange juice remains one of the most popular soft drinks around the world, but challenging weather conditions in 2021, 2022 and 2023 in the world's major production regions of Brazil and Florida mean that the supply chain faces record raw material costs. As a result, producers will need to focus more than ever on production efficiencies in order to maximise margins.

The good news is that the demand for orange juice remains high, despite consumers in some markets, such as Europe, moving away from fruit juices and related products as they are perceived to be relatively high in sugar and calories. This fall in demand has been compensated for by increasing demand from food processors for the production of smoothies and flavoured water, which are generally perceived as healthier choices. Demand for straight orange juice also received a significant boost as a result of the COVID pandemic around the world. Overall, most analysts predict level or slightly increased worldwide demand for the next few years.

Production challenges

The trouble for the industry is that despite this buoyant demand, the last couple of years have seen reduced fruit output from the major production areas of Brazil and Florida. Other less important producers are also struggling, with European production also down this year, in line with a longer-term trend.

Brazil, the world's largest grower of citrus fruit, suffered significant frosts and droughts during the 2021 growing season, but production is projected to bounce back by 20.5% to 317 million boxes for the 2022/23 season. However, the final

effects of a warmer winter season, which saw higher than normal levels of fruit drop, still have to be assessed. At the same time, lower than normal stocks from 2021/22 have kept local prices high (up to 50% higher in July 2022 compared with the previous year).

In contrast, production from Florida (the second largest producer of citrus in the world) is estimated to fall 62% for the 2022/23 season to just 15.7 million boxes. This represents the largest fall in production in 110 years. The reasons for Florida's reduced production are related not just to weather (orange groves have suffered damage from hurricanes, frosts and insect damage), but also to citrus greening disease, a bacterium which causes fruit to shrivel and fall from the tree before it is ripe. The number of Valencia orange trees in Florida has also fallen from 36 million in 2006 to just 30 million today as real estate and land prices in the state persuade many growers to cash in the value of their land.

Difficult markets

It's no wonder markets are nervous, with orange juice futures matching historical highs in New York at the end of 2022 with increases of 50% or more compared to the previous year. According to some estimates, US orange juice production alone will fall 6.5% to 215,000 tonnes for the current year, although stocks of juice are expected to remain stable.

All of these factors mean that orange juice producers, whether using concentrate or frozen not-from-concentrate (NFC) juice, face an increase in raw material costs of around 50%. Add this to the global energy crisis following Russia's invasion of Ukraine, which saw energy prices rise as much as 60% for oil and 400% for natural gas in Europe (although prices at the start of 2023 were much closer to pre-invasion levels), and producers are in the frontline of food inflation.

Faced with unavoidable rises in input costs, not all of which can be passed on to customers or consumers, manufacturers must make every effort to maximise the efficiency of processes such as remelting and pasteurisation. At the same time, they need to maintain the key quality characteristics of the juice, even though chemical changes begin as soon as the juice is squeezed.



HRS Heat Exchangers produce a range of energy-efficient equipment for orange juice processing.

Pasteurisation options

Thermal treatment, sometimes known as 'flash pasteurisation', is the preferred technique for making premium juice. The HRS MI and MR Series of pasteurisers use food-grade, multi-tube, corrugated heat exchangers to speed up the heat transfer in pasteurisation systems. These corrugated tubes create extra turbulence in the fluid as it flows through the tubes.

This extra turbulence means that the orange juice can be heated up to pasteurisation temperature much faster — typically by up to 30%. Because of the high heat transfer rates of the corrugated tube technique, HRS's pasteurisation systems use water at a lower temperature to reduce the risk of product damage. Another benefit of higher heat transfer rates is that the system footprint can be reduced by using shorter heat exchanger pipes. The shorter length of the heat exchanger also results in a reduction in pressure drop, which saves pumping power and further reduces energy costs — often by 40%.

One issue with flash pasteurisation is that it still takes time to evenly heat the product, adding to the total processing time and increasing the risk of adversely altering the product's organoleptic properties. In contrast, ohmic heating, which uses electricity to heat the product rapidly and uniformly, has been scientifically shown to be highly effective while maintaining flavours and quality.

The HRS ohmic pasteurisation system

The HRS ohmic system works by passing electricity between two electrodes in the product in a 1 m ceramic tube, so the electricity has to pass through the product. The result is that the juice is heated up to 105°C within one second. It is then held at this temperature for four seconds before being cooled. Ohmic technology itself is not new, but the HRS system uses the latest electronics to ensure that the temperature curve is smooth, which not only helps to preserve product quality but also improves process efficiency.

Raw material handling

The HRS I Series offers options to de-pack and crush (the IC Series) then melt (IM Series) frozen fruit juice (a process also sometimes known as re-melting) ready for storage or further processing. The IC Series features a roller conveyor which feeds individual drums into a tipper that empties them into the crusher. Here, a specially designed spiked roller crushes the solid ice into an icy slush, which is then transferred to the IM Series re-melting device.

Based on the tubular heat exchanger technology, the IM Series raises the temperature of the juice from frozen to around 4°C in 90 seconds. From here, the cold liquid juice can be pumped to a holding tank, or straight into the next process step.

HRS Heat Exchangers Pty Ltd
www.hrs-heatexchangers.com/anz



Juicy research for alt meats

One of the obstacles to the uptake of plant-based alternatives to meat can be their very dry and astringent feel when being eaten.

Scientists at the University of Leeds, led by Professor Anwesha Sarkar, are now using one simple ingredient — water — to improve the sensation of plant proteins and make them more palatable as a meat substitute.

The researchers created plant protein microgels, through a process called microgelation. In this process, plant proteins are placed in water and subjected to heating, altering the structure of the protein molecules which come together to form a gel.

The gel is then homogenised, breaking the protein network into a microgel made up of tiny particles. Under pressure, as they would be when they are being

eaten, the microgels ooze water, creating a lubricity akin to that of single cream.

According to Sarkar, this turns the dry plant protein into a hydrated one, giving a juicy feel in the mouth when consumed.

The team hopes this will aid consumer interest in plant-based proteins.

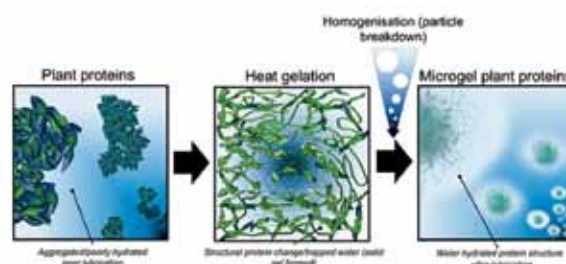
Throughout the investigation, the team mathematically modelled the behaviour of plant protein microgels. The proof came in visualisations produced in the atomic force microscopy suite in the Faculty of Engineering and Physical Sciences at Leeds. Atomic force microscopy involves a tiny probe scanning the surface of a molecule to get a picture of its shape. The images revealed that the

protein microgels were spherical and not aggregating or clumping together.

Due to their lubricity, the microgels may be adapted for other uses in the food processing industry, such as replacing fat that has been removed from a foodstuff to develop healthier options.

“This is quite a remarkable finding. It is striking that without adding a drop of fat, the microgels resembles the lubricity of a 20% fat emulsion, which we are the first to report,” said Ben Kew, doctoral student in the School of Food Science and Nutrition at Leeds and lead researcher in the project.

The research findings have been published in the scientific journal *Nature Communications*.



Molecular filter

Camfil's CamCarb XG is a versatile, ergonomic and corrosion-resistant filter suitable for supply, recirculation and exhaust air systems in commercial, industrial and process applications. Its conical shape enables high removal efficiency while maintaining low-pressure drop.

The filter's patented design maximises adsorbent media utilisation, resulting in an overall lighter-weight filter with a longer lifetime compared to the previous-generation cylinder. This lowers the total cost of ownership (TCO).

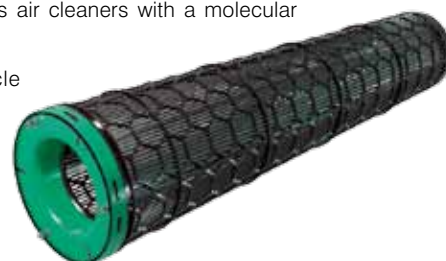
Along with improved filter performance, the product features robust construction and is incinerable, with no adhesive used in construction, no degradation of media and negligible outgassing. It is fillable with a wide range of molecular filtration media for various applications.

CamCarb XG can be installed in supply, recirculation and exhaust air systems. When mounted in the holding frame, all internal leaks are eliminated for high-efficiency operation. The product can also be supplied in Camfil's air cleaners with a molecular module or in a CamCube/GlidePack housing.

Two-stage filtration is available as an option, with a mounting rail for 48 mm particle pre - or after-filters. Housings are used in comfort and industrial applications.

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Oxygen pick-up in beer filling

Brewers are all too aware of the fact that beer reacts sensitively to oxygen, and off-flavours can result if there's too much oxygen pick-up. Craft beers made using the rediscovered cold or dry hopping technique are susceptible to altered taste as a result of oxygen pick-up. Standard light beers are also especially sensitive to oxygen; on the other hand, dark beers often display considerable flavour tolerance to an oxygen content of above and beyond 0.1 mg/L.

Oxygen pick-up in beer production starts with the crushing of the malt and continues even after the beer has left the brewery, as oxygen penetrates seals on crown corks, for instance, up to the point where the beer is drunk. Beer ingredients react so fast with oxygen that dissolved oxygen measurements have to be taken immediately after the respective processes of tank filling, filtration or

bottling, for example. An oxidised beer with its typical changes in taste often contains barely measurable amounts of oxygen, yet the negative impact on quality is substantial.

The use of additives such as bisulfite or ascorbic acid as oxygen scavengers is common in countries other than Germany, especially when filling beer into PET bottles. This is because these containers, plus the PE or PP caps most commonly used to seal them, allow relevant amounts of oxygen to migrate very quickly. Using ascorbic acid as an antioxidant in beer is a two-edged sword, however. Oxidation processes — not just in beer but also in other beverages such as soft drinks and juice — are complex procedures with many intermediate stages and thus much more than simply the transfer of oxygen to a specific receptor molecule. Are the polyphenols in the malt or hops beneficial antioxidants or damaging haze formers?

This is a different story altogether that scientists continue to research.

In order to rise to this challenge, breweries have developed a number of approaches to quality assurance: from the use of malts low in polyphenols to polyphenol-rich whole cone hopping or from strategies for preservation or precipitation of the polyphenols to those aimed at polyphenol reduction using PVPP.

Avoiding or reducing oxygen pick-up for flavour stability

The expert community agrees that avoiding or reducing oxygen pick-up is the most important step in achieving the longest possible flavour stability. To this end, tanks are pressurised with inert gas, for instance, and often cleaned in the presence of this gas to prevent any loss of it. If the inert gas is CO₂, only acidic cleaning is possible on retention



Hygienically designed bottle transfer at OeTTINGER Brewery.
(Source: Frank Reinhold)



During bottle filling a new hollow probe filler enables greatly reduced CO₂ consumption on the one hand and even lower oxygen pickup on the other. (Source: KHS Group)

of this gas. If N₂ is used, the amount of dissolved N₂ in the beer must be observed to achieve an undisrupted filling performance and not generate any untypical foam structures for the consumer. Alternatives such as argon would be prohibitively expensive.

As a general rule, tank pressures should be selected so that they are as low as possible to match the partial CO₂ pressure of the beer and in order that pumps can be used for any necessary pressure increases. During filtration the use of deaerated water is strongly recommended. An oxygen content of below 0.2 mg/L is to be aimed for here — also for purging water during flash pasteurisation, for example — as non-deaerated water contains about 10 mg/L.

Measuring the amount of oxygen when monitoring purging processes with mixing phase separation reveals deficiencies much earlier than measuring

the original gravity, for instance. Today's requirements and opportunities are such that it even seems prudent to abandon the mg/L (~ ppm) unit of measurement used to date for oxygen pick-up and instead switch to the more convenient unit of µg/L (~ ppb).¹ Prior to filling, beer not infrequently contains 5 µg/L of oxygen or lower; in other words, less than 0.005 mg/L. Whereas a few years ago filling systems that achieved total oxygen pick-up levels of 150 µg/L were common, nowadays as little as 20 µg/L are possible with the right technology.

Determination of the total oxygen content

The total oxygen content, often referred to as the TPO or total packaged oxygen, includes both the oxygen dissolved in the beer and that found in the head space of the closed container. The method for ascertaining the 'air in the head space'

by transferring this head space gas into a burette filled with caustic to adsorb the CO₂ is still used today for reasons of simplicity. However, the gas composition in the head space does not only comprise CO₂ and air with the usual percentage of oxygen. This therefore renders the 'air in the head space' not entirely suitable for the determination of the TPO. Measuring devices are now available for precise stipulation of the total oxygen content that measure both the head space oxygen and the oxygen dissolved in the beverage more or less automatically. Together with temperature and complex pressure measurements, here the head space volume, CO₂ content and even other dissolved gases are computed entirely automatically.

Almost 40 years ago, master brewers Uhlig and Vilachá from the Polar Brewery in Caracas, Venezuela, developed a formula that, using an oxygen measur-

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In beer production, breweries can obtain good quality with a low oxygen content with the help of the latest technology

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Digital and automated systems synchronise the filling processes and thus considerably boost efficiency. (Source: Frank Reinhold)

ing device for dissolved oxygen and by determining the temperature and head space and filling volume, was also able to establish the TPO with high precision. For this purpose, the containers are brought into a state of gas equilibrium by agitation. This method has the advantage that all process steps in beer production and filling can be monitored by a single mobile device; with it, even gas-in-gas measurements are now possible, with only an additional piercing device with an inert gas supply needed for measurements taken from bottles or cans. The dissolved oxygen of a beverage in a state of gas equilibrium in a bottle or can must then be multiplied by a calculated factor to obtain the TPO. This factor lies between two and three for normal containers and filling temperatures. Modern filling machines achieve measurement values for dissolved oxygen that in agitated containers even lie below those taken upstream of the filler. In comparison, measurements in unagitated containers yield information on the efficiency of the essential foaming prior to closure or on the construction and configuration of the undercover gasser on a can seamer.

This comparison reveals that on modern filling systems the filling process as such is only accountable for 10 to 20% of the total oxygen content in a filled and sealed container. Oxygen pick-up

during filling is always to be seen in relation to the inert gas consumption required for this process. Whereas in the past such low oxygen pick-up was impossible even with high consumption levels — or was possibly considered unnecessary — considerable improvements have since been made.

Depending on the required or selected filling method, N₂ can now also be used — today, this can be produced at a reasonable price in-house by molecular sieves.

Case study: technologies for good beer quality

In beer production, breweries can obtain good quality with a low oxygen content with the help of the latest technology. First and foremost, this makes the use of additives such as bisulfite or ascorbic acid as oxygen scavengers superfluous. This is exactly the point KHS has addressed with the development of its modular Innofill Glass DRS ECO filling system.

There are currently 23 sites across the world using the filling technology and one such site is the OeTTINGER Brewery in Mönchengladbach, Germany.

The technology has been engineered to let less oxygen into the beer — and in doing so consumes not more but less CO₂ than its predecessor. During bottle filling a new hollow probe filler enables reduced CO₂ consumption on the one

hand and even lower oxygen pick-up on the other.

The container is first evacuated through the vacuum channel and then purged with CO₂ gas. A KHS-patented purging process is used to this end. The container is then pressurised to filling pressure with the inert gas as usual. This makes a low total oxygen pick-up of 20 ppb possible at a CO₂ consumption of 160 g/hL. Further reducing the CO₂ consumption to 110 g/hL, for example — half of what was usual to date — also facilitates a low oxygen pick-up of 40 ppb. The required total oxygen pick-up can therefore be selected as needed, meaning that a range of automatic product type conversions can be set with maximum CO₂ savings for an especially oxygen-sensitive cold-hopped beer, a dark beer insensitive to oxygen or even for totally different filling products such as soft drinks.

The lower the consumption of carbon dioxide for the filled bottle, the more efficient the production process — and the lower the oxygen pick-up, the better the product quality. Also, the KHS digital and automated systems synchronise the filling processes and thus further boost efficiency.

1. ppb = parts per billion; 1 ppb is the equivalent of 1 µg per kilogram, for example.

KHS Pacific Pty Ltd
www.khs.com



Checkweighing portfolio

Mettler-Toledo Product Inspection has redesigned its C2 High-load Checkweighing portfolio, capable of weighing heavy loads of up to 35 kg. This mechanical re-engineering applies to the Mettler-Toledo C21 StandardLine and C23 PlusLine checkweighing systems for precision weighing and completeness checks of packaged food, pharma, cosmetics and pet food products.

The primary objective behind the redesign is to boost productivity for manufacturers and to better address the specific requirements of those seeking robust, cost-effective checkweighing solutions for heavy loads. C2 High-load checkweighers are typically installed at the end of the production line, where they perform quality assurance operations such as case completeness checks by verifying the presence of the correct number of bottles in a case.

With a 50% reduction in motor power consumption, the new design brings energy savings, reducing operational expenses. Additionally, the portfolio helps minimise stock costs by reducing different wear parts by 50%, simplifying maintenance and improving inventory management thereby lowering total cost of ownership (TCO). Integration with ProdX and Open Platform Communications (OPC) facilitates increased automation, reducing manual work and optimising overall costs.

The portfolio's easy and fast belt and roller replacement capabilities minimise downtime and maintenance efforts, helping to deliver uninterrupted operations.

Featuring an optimised frame design with fewer horizontal surfaces, the system enables easier cleaning and minimises dust accumulation, maintaining cleanliness and helping to comply with hygiene standards.

The integration of the latest filter technology enhances the system's ability to deliver good weighing results, for quality control and compliance with stringent standards.

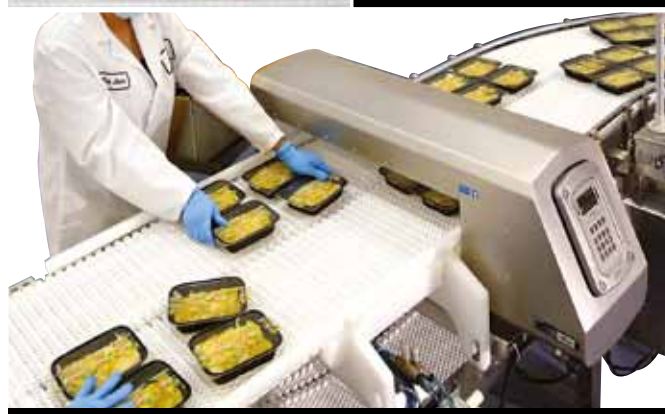
Service support is also available with all product inspection equipment from Mettler-Toledo.

Designed to accommodate diverse product handling needs, the portfolio includes large conveyor sizes capable of supporting belt widths up to 600 mm.

To meet different operational conditions, the systems are available in both IP54 and IP65 designs.

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CASE STUDY

Tequila maker uses AI solution to predict demand

One of the world's largest producers of tequila is using Aera Technology's Decision Intelligence solution, an artificial intelligence (AI) business decision-making cloud.

In the last five years, Proximo Spirits, a subsidiary of Becele, has created premium tequila and whiskey brands to drive double-digit growth while maintaining artisanal production tradition. This high growth has led the company to turn to Decision Intelligence to predict demand using the most recent data available from a range of sources, manage inventory more effectively and respond to change quickly.

Luis Gonzalez, Global Supply Chain Director, Becele, said, "Aera Technology shares our focus on creating solutions that will evolve our decision-making to maximise opportunities, elevate service and position Proximo Spirits for long-term success."

Aera Decision's Cloud, which has been purpose-built for Decision Intelligence, will allow Proximo to improve and accelerate forecast and demand planning decisions across



product lines in the US and Canada. This includes the development and deployment of a Forecast-as-a-Service Skill and future Aera Skills, enabling customised, digitised decision-making to understand, recommend, act and learn for Proximo's specific business case.

"It's an honour to partner with the passionate team at Proximo Spirits," said Fred Laluyaux, CEO, Aera Technology. "We look forward to working together to realise new opportunities and drive value through Decision Intelligence for the company's premium spirits and loyal customers."

Aera is working alongside Deloitte Consulting to provide the tools and process to enable Proximo's demand planning capability.

CASE STUDY

Confectionery packaging company increases capacity by 50%



Kingsway Confectionery is a family-owned company that has specialised in packaging retail-ready products for over 30 years. In its latest facility upgrade, TNA's integrated packaging solution has enabled the Australian confectionery packaging company to increase production capacity by 50%.

Over the last 15 years, Kingsway Confectionery has continuously upgraded its facilities using Australian-made machinery provided by TNA.

To remain competitive in the confectionery market, the company recognised the need for machinery that could enhance performance and speed. Seeking a solution that could support a wide range of bag sizes, cater to its diverse customer base and

provide a strong return on investment, Kingsway Confectionery integrated a third tna robag vertical form, fill and seal (VFFS) packaging system into its production line.

The system provides good speed and flexibility, allowing Kingsway Confectionery to efficiently package any type of snack or food application.

Raymond Wicks, General Manager of Kingsway Confectionery, said: "Adding a third robag machine increased our capacity by 50%. We went from 40–59 bpm to 80–100 bpm for bag sizes spanning anywhere from 30 to 400 grams."

In addition to improving speed and efficiency, the system seamlessly fitted into operations as a complete solution. The integration with the tna intelli-weigh alpha provided a simple and accurate weighing solution, enhancing flexibility for rapid product changeovers. This enabled the company to scale production capacity and meet the evolving needs of its customers without disruptions.

Beyond enhanced packaging capabilities, Kingsway Confectionery also highlighted the importance of timely technical support and readily available spare parts. "Over the last 14 years, we wouldn't have had a machine down for longer than a day due to TNA's team helping us," Wicks said. The proximity of TNA's factory in Melbourne further facilitated swift access to spare parts, streamlining maintenance and support.

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COMPASS Optical Sorters — a quantum leap in sorting technology

The latest technology in the COMPASS optical sorter offers improved sorting accuracy and ease of use.

In the modern food processing industry, product sorting, defect detection and foreign material (FM) detection are typically carried out using automated sorting equipment in the form of either a belt fed sorter or a chute fed sorter, depending on the conveyance characteristics of the food product. Chute-fed sorters are used to inspect dry or frozen products, while belt sorters are used when the product is wet, sticky or delicate.

Chute sorters give a doubled sided view

In a chute sorter, the product falls through a space between entry and exit chutes where defect detection technology can be applied from opposing sides, allowing both sides of the product to be scanned.

Chute sorters typically use laser or vision technology for defect and FM detection. While laser detection has advantages such as simplicity and speed in measuring physical dimensions, it can have limitations when it comes to handling more complex sorting criteria. Having moving parts, laser sorters also require relatively frequent calibration and replacement, adding to maintenance costs. In contrast, today's chute sorters utilising advanced vision sensor technology are able to make highly accurate sorting decisions based on visual attributes in addition to size and shape, such as colour defects, and other visual characteristics, while having a long operating life and requiring less physical adjustment.

Introducing the COMPASS sorter

Food processing is a constantly changing market, and as the industry evolves, so must the equipment. A new portfolio of optical food sorters, announced earlier this year,



COMPASS chute-fed sorters can sort processed, frozen and pre-processed vegetables and fruits, nuts, dried fruits, confections and other food products.

are promising to take the food inspection process one step further, with extreme ease of use, and accurate results through every production run.

The new COMPASS family of optical sorters from Key Technology are a direct response to industry demand for easier to use, easier to clean, powerful sorting solutions — with low cost of ownership.

The first solution in the new COMPASS line up — a chute-fed model — has just been released, with a belt-fed model expected next.

"Optical sorting technology has developed significantly over the last decade, and more advanced sorting capabilities generally meant

"Its low cost of ownership makes it possible for food processors to realise a higher return and shorter payback on their initial investment."

a system that was also more complex to operate and costly to maintain," said Mark Holden, Key Technology Territory Manager for Heat and Control Pty Ltd. "The COMPASS optical sorter is the first of its kind that offers consistently high sort accuracy and significantly simpler and more intuitive operation than other food sorting systems."



COMPASS chute-fed sorters can sort processed, frozen and pre-processed vegetables and fruits, nuts, dried fruits, confections and other food products. Thanks to its advanced sensors and lighting technology, as well as Key's NEXT sort engine, COMPASS accurately identifies and separates plastic, glass, paper and other organic and inorganic foreign material from the line, in addition to sorting the specific product defects each processor wants to manage to deliver its customers the product quality grade they expect.

Vision advancements

One of the technological advancements introduced in the COMPASS chute sorter's vision system is a new class of sensors to inspect each item in the product stream on the basis of its colour, size, shape and material characteristics. Utilising a unique feature called Pixel Fusion, COMPASS sorters merge the input of multiple sensors into every pixel of the images the sorter takes to analyse the food processing line stream. This superset of information allows the sorter to make clear, accurate determinations about whether an object is a good piece of product, or a product defect or foreign material that should be removed from the line.

The sensor technology in COMPASS also incorporates short-wave infrared imaging in addition to colour, allowing the sorter to pick

"The COMPASS optical sorter is the first of its kind that offers consistently high sort accuracy and significantly simpler and more intuitive operation than other food sorting systems."

up material properties such as moisture levels and certain chemical properties.

Ease of use

Key Technology has also designed COMPASS for ease of use. The new, ergonomically designed user interface greatly simplifies the critical tasks the operator performs to set up the sorter to start production, and make any adjustments required while in production. A new production operator with no technical background can learn how to operate the system proficiently in a very short time.

The COMPASS chute sorter is offered in widths of 600mm and 1200mm, and in a configurable range of system types and sizes to meet individual customer applications and capacity requirements.

Data integration

COMPASS also features Key Discovery data analytics and reporting software that turns the sorter into an IIoT-connected device, suitable for Industry 4.0.

Key Discovery provides access to valuable reports and live dashboards to analyse and understand trends in product quality and the sorting process. COMPASS can also connect flexibly with other line equipment upstream or downstream from it, and with any SCADA and MES line management software.

Low maintenance overhead

COMPASS is efficient to operate and easy to maintain. With no moving parts, normal cleaning is the only maintenance required. Food-safe design features and easy access to critical equipment areas minimise the time required to clean and sanitise the equipment after production. Its low cost of ownership makes it possible for food processors to realise a higher return and shorter payback on their initial investment.

In 2024 Key Technology will also introduce COMPASS belt-fed sorters for applications including fresh-cut vegetables, leafy greens potato chips, snacks and bakery products.

HEAT AND CONTROL

Heat and Control Pty Ltd
www.heatandcontrol.com

Arnott's Group

opens \$65m automated distribution centre in Western Sydney

The Arnott's Group (the Group) has officially opened its \$65 million Automated Distribution Centre in Huntingwood, Western Sydney, adjacent to the Group's largest biscuit site, in a move set to facilitate the Group's domestic and international growth aspirations.

The opening was attended by local MP and Member for Prospect Dr Hugh McDermott, together with Elders from the Deerubbin Aboriginal Land Council, Arnott's Group Executives and 50 of the Group's top suppliers, including representatives from automation partner Daifuku and logistics partner Linfox.

The Distribution Centre serves as a thoroughfare for over 60% of the Group's national inventory, delivering significant operational savings, with its location placing it in prime proximity to distribution hubs for key retail partners.

The 43,000 m² site can accommodate 28,000 pallets — almost four times the site's previous capacity — and was constructed with a sophisticated 'one-touch' logistics solution, leveraging robotics and automation. The site incorporates minimal touch-point automation and a new palletising system with a 35-metre-high bay.

Arnott's Group Director of Procurement and Logistics Tom Vicars said the distribution centre had already unlocked significant efficiencies and scale for the business, necessary if it is to meet its significant growth plans.

"We continue to expand our Australian operations and need the storage and logistics infrastructure in place to



accommodate this growth. We intend for Western Sydney to be the beating heart of our national operations, and you need only step into the warehouse to get a sense of the sheer scale of what we are hoping to achieve."

Speaking at the opening event, Michael Jee, Executive General Manager at Daifuku, said it was an honour to partner with such an iconic Australian company to create a facility that has already increased efficiencies across its operations.

"The solutions within the facility are designed to streamline the process from manufacturing through to delivery, with automation meaning products are inducted, stored, monitored and prepared for delivery with minimal human intervention. This one-touch philosophy means that both products and orders are managed and prepared faster, improving delivery times to store and providing an unparalleled level of visibility and productivity."

The day-to-day operations of the site are managed in conjunction with Linfox, as part of a 15-year national agreement with The Arnott's Group.

Linfox ANZ CEO Mark Mazurek said: "Linfox is proud to be a key partner of The Arnott's Group in Australia and New Zealand. Our shared commitment to safe and better ways of working has been the cornerstone of our relationship, and together we have created industry-leading environments and solutions for our teams. We look forward to continuing the success of the Huntingwood facility and supporting The Arnott's Group into the future."

Coinciding with the launch was the installation of 2464 solar panels on the roof of the Distribution Centre, expected to generate over 1500 gigawatt-hours of renewable energy, which, combined with the factory installation, will supply up to 22% of the total electricity needs for Arnott's Huntingwood.

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Frequency inverters

Nord Drivesystems NORDAC ON frequency inverters have been designed for the requirements of horizontal conveyor technology.

The frequency inverter is characterised by an integrated multi-protocol Ethernet interface, IIoT capability, full pluggability and a compact design. The series comprises three variants, NORDAC ON for the operation with IE3 asynchronous motors, NORDAC ON+ for the combination with the highly efficient IE5+ synchronous motor and NORDAC ON PURE in wash-down design.

The NORDAC ON PURE SK 35xP has been designed for conveyor applications in the food and beverage industry requiring powers up to 1.5 kW. It has a wash-down design with round and smooth surface and protection class IP69, making it suitable for demanding requirements. The nsd tupH surface treatment offers corrosion protection. To reduce the cleaning effort, the required connections have been reduced to a minimum number of high-performance plugs for the connection of hybrid cables via a one-cable solution. The inverters are suitable for direct motor mounting or for wall mounting. Several inverters can be easily connected via daisy chain.

All frequency inverters in the series — NORDAC ON, NORDAC ON+ and NORDAC ON PURE — have a temperature range of -30 to +40°C and are suitable for deep-freeze applications.

With a wide speed and adjustment range, NORDAC ON drives allow for the reduction of variants, for example, in large intralogistics systems. It is possible to cover the required torques and speeds in a system using as few different drive variants as is economically feasible, and to optimise the Total Cost of Ownership (TCO).

The series' high overload capacity is also advantageous for a variant reduction. All frequency inverters have an overload capability of up to 150% for 60 seconds, and by 200% for 5 seconds.

NORD Drivesystems (Aust) Pty Ltd
www.nord.com

All-in-one food and beverage batching solutions

A batch automation system is composed of several key components that work together to manage and regulate the food or beverage production process.

A typical batch control 'loop' includes closed-loop control provided by a PLC or other controller. Sensors and instrumentation measure critical process parameters such as temperature, pressure, levels, flow rates and pH. These sensors provide real-time data to the batch control system for monitoring and control of actuators and other control devices to adjust process variables accordingly, such as opening/closing valves, adjusting motor speeds or controlling heating elements.

Lastly a human-machine interface (HMI) provides a dashboard for control of the overall process.

Typically, a batch system may be built from components from various automation technology suppliers, which then must be connected with each other and configured to work together.

Now Bürkert is offering a turnkey fluid batching solution comprising sensors, valve actuators and batch controller, with the option of an integrated HMI.

By combining Bürkert's Type ME43 or Type ME63 batch controller with an extensive portfolio of flow sensors and valve actuators, Bürkert can provide individual batch systems that are customised to suit the needs of the application — either as a control cabinet installation with the Type ME43 or as a field installation with the Type ME63.

The completed solution includes all the components needed for a batching system supporting up to three valves, which can be supplemented with the Type ME61 touch capable process control display that comes with a preconfigured batching dashboard.

The Type ME43 and ME63 controllers provide an all-digital solution. The components in Bürkert's custom batch systems are part of its Efficient Device Integration Platform (EDIP), which facilitates the digital integration of field devices in an existing system, right down to the sensor and actuator level. Communication between EDIP devices is made possible due to a digital interface: the Bürkert system bus. Bürkert's bus is based on, and is fully compatible with, the CANopen industrial standard. It also features additional functions for simplified operation. A gateway function in the Type ME43 and ME63 controllers also allows the integration of the batch control into higher-level automation systems using other industrial standards, like PROFINET, EtherNet/IP, Modbus TCP and PROFIBUS.

Bürkert's portfolio of products and services can be customised to suit diverse applications within the food and beverage industry, including brewing, precision fermentation and alternative dairy product applications.

Bürkert Fluid Control Systems

www.burkert.com.au



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CASE STUDY

Forklifts are just the remedy

Over the course of the last decade, Remedy Drinks has built its business using the help of battery-electric Toyota Material Handling forklifts to distribute its products.

Since its opening in 2012 by Sarah and Emmet Condon, Remedy Drinks has become recognised for its home-brewed kombucha and has grown from a small operation in Melbourne's south-east suburbs to a large dual warehouse and production facility in Dandenong South. It now has an expanded product line that includes Sodaly natural soft drinks, Kick natural energy drinks, miniature energy shots and apple cider vinegar-based beverages.

Over this time, the company has also had a successful partnership with Toyota Material Handling Australia (TMHA), going back to its first forklift — a second-hand Toyota unit.

Today, Remedy's fleet of TMHA equipment includes eight reach and four counterbalance Toyota forklifts, all underpinned by battery-electric powertrains that produce zero operating emissions.

Ryan Stark, Remedy Drinks warehouse manager, said the user-friendly forklifts have allowed the company to keep up with increased demand for its products.

"The warehouse and logistics team's primary role is to ensure our product is delivered to our customers, and knowing that our equipment onsite can do that is our number-one priority," Stark said.

"From an operational perspective, they are an easy vehicle to operate.



"They have all the bells and whistles that I think are required on a forklift particularly from a safety perspective."

The TMHA I_Site telematics and fleet management system particularly benefits Remedy's logistics team, helping fleets improve efficiencies relating to equipment utilisation, downtime and WHS, and allowing the company to streamline processes in the warehouse.

The forklift equipment is fitted with proximity-linked speed limiting technology, which is designed to help maximise safety for the forklift operators and surrounding pedestrians.

"All that automation, keeping it all digital and software-based is a huge thing for us," Stark said.

Grant Owen, TMHA area sales manager, has overseen the Remedy Drinks account from the time they owned only a single second-hand unit. He has, over that time, facilitated the company's first new purchase — a pair of Toyota RRE140 reach forklifts — and been there for the company's expansion into larger facilities and growth including contracts with major retailers including Coles and Woolworths.

Remedy Drinks has no plans to slow down and TMHA has a wide range of products that will be able to help with any further expansion.

Toyota Material Handling Australia Pty Ltd
www.toyotamaterialhandling.com.au

CASE STUDY

Suntory Japan installs conveying solution to improve efficiency



Suntory Japan's newest bottling facility, Shinano-no-mori Plant, is the production home for its Tennensui mineral water, produced in a lightweight PET bottle. The weight of the bottle increases quality risks during production, such as dents being caused by contact between the bottles or bottles falling.

The company required a product handling solution that would protect the bottle's exterior and prevent the possibility of bottles falling. Suntory installed the Sidel Gebo AQFlex product conveying and accumulation solution, which is designed to be gentle and contactless, handling containers in a single lane.

The fully automatic solution has a compact all-in-one design which has enabled Suntory Japan to improve its line layout and achieve high productivity while ensuring employee safety.

"Gebo AQFlex has improved our production line in many ways, from the space-saving aspect, the simplicity of layouts to the wide range of automation solutions, and it has contributed to improving the line's operating rate and quality," said Toshiya Kobayashi, Chief Operating Officer, Global Technical Department at Suntory Japan.

Suntory Japan currently manufactures two types of bottles at the plant, the small 550 mL plastic bottle and the large 2 L plastic bottle, but the solution has flexibility to increase and introduce new bottle formats if needed in the future.

"The solution can accommodate any product, whatever the application, in all container materials, formats and shapes," said Nicolas Bossert from Sidel.

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Making plant-based meat more 'meaty'

Plant-based alternatives such as tempeh and bean burgers provide protein-rich alternatives for those who want to reduce their meat consumption. However, the challenge has been replicating the flavours and aromas of meat, with companies often relying on synthetic additives.

A study in ACS's *Journal of Agricultural and Food Chemistry* unveils a potential solution: onions, chives and leeks that produce natural chemicals akin to the savoury scents of meat when fermented with common fungi.

Often, precursor ingredients found in meats are used to make plant-based alternatives taste meatier. These flavourings are made through synthetic processes, so many countries will not allow food makers to label them as 'natural'. To access a 'natural' plant-based meat flavour, the flavouring chemicals need to be physically extracted from plants or generated biochemically with enzymes, bacteria or fungi.

YanYan Zhang and colleagues wanted to see if fungi known to produce meaty flavours and odours from synthetic sources could be used to create the same chemicals from vegetables or spices.

The team fermented various fungal species with a range of foods and found that meaty aromas only came from foods in the *Allium* family, such as onions and leeks. The most strongly scented sample came from an 10-hour-long fermentation of



onion using the fungus *Polyporus umbellatus*, which produced a fatty and meaty scent similar to liver sausage.

Using gas chromatography-mass spectrometry, the researchers analysed the onion ferments to identify flavour and odour chemicals and found many that are known to be responsible for different flavours in meats. A chemical they identified was bis(2-methyl-3-furyl) disulphide, a potent odorant in meaty and savoury foods. The researchers say that the high sulfur content in alliums contributes to their ability to yield meat-flavoured compounds, which also often contain sulfur.

According to the researchers, these onion ferments could one day be used as a natural flavouring in various plant-based meat alternatives.

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Safety air gun

The EXAIR VariBlast Precision Safety Air Gun is a tool for processes needing a handheld blowoff solution. It provides a focused blast of

air and employs an engineered, variable flow trigger to produce a range of force values for different applications. It is CE compliant and meets health, safety and environmental protection standards.

It is available with a standard 12" (305 mm) or 20" (508 mm) extension that can also be outfitted with an impact-resistant polycarbonate Chip Shield. The air gun body is made of high-impact polyacetal and features a hanger loop for easy storage. The airflow that exits the nozzle can't be blocked and produces a quiet 58 to 75 dBA noise level (according to air nozzle used) meeting OSHA standards for dead-end pressure and sound level exposure.

The VariBlast Precision Safety Air Gun is compatible with various nozzles to allow configuration for unique processes.

Compressed Air Australia Pty Ltd

www.caasafety.com.au

Blower for PET containers

Sidel has launched the EvoBLOW XL for large PET containers. The machine extends Sidel's blowing capabilities for sizes up to 10 L PET bottles and is suitable for water, edible oil and food markets.

Available as a standalone or integrated combi solution, the blower is suitable for a wide range of bottle formats for up to 8 to 10 L. It features flexible oven configurations with a wide choice of bottleneck dimensions and complements Sidel's existing complete line capabilities for large containers.

With blowing outputs up to 18,000 bottles per hour (bph) and 98% Overall Equipment Effectiveness (OEE), the blower is equipped with an ergonomic embedded mould-handling tool to simplify heavy mould positioning. The mobile mould storage unit provides safe access to moulds close to the machine.

The blower has been developed to manage the challenges associated with rPET grades and possesses process capabilities from virgin PET to up to 100% rPET. It offers lightweighting opportunities for users, which can provide savings on PET costs and minimise CO₂ emissions. This includes the possibility to switch from HDPE to PET large bottles to further reduce carbon footprints. Further sustainability benefits are also achieved through the design of blowing circuits and valves which help reduce energy consumption.

The machine uses an optimised process and blowing curve with its blowing circuit and valves to deliver material distribution at fast speeds with 1500 bph per mould.

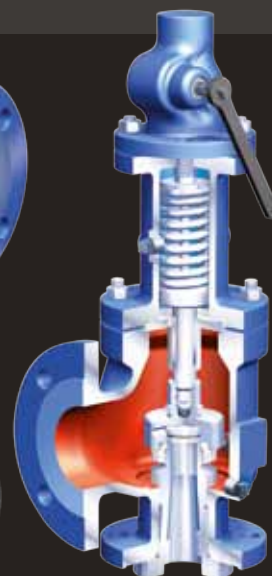
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Single-phase IE2 motor

While NORD Drivesystems offers IE4 and IE5 motors, it also offers solutions for lower performance ranges. The company has now introduced a single-phase asynchronous motor with a new design and has also improved efficiency by one efficiency class.

The more efficient single-phase asynchronous motor can be used in a power range from 0.12 to 1.5 kW as before, but now corresponds to efficiency class IE2 according to the Ecodesign Regulation 2019/1781. An electronic relay replaces the previous mechanical one. The design was also refreshed and the capacitors are mounted in the terminal box, so that the motor now also complies with protection class IP66, and is protected against the entry of dust and water.

The motor is approved for use in many regions of the world due to certification according to the European CE mark, the Chinese CCC standard and the UKCA mark for Great Britain.

NORD Drivesystems (Aust) Pty Ltd

www.nord.com

Electro-pneumatic and electric vacuum regulator series

SMC's range of electro-pneumatic/electric vacuum regulators has received an IIoT upgrade to include IO-Link functionalities.

The ITV series is a component in the range that required a new-age 'facelift'. The series offers dynamic control of air pressure by means of electrical signals and the IO-Link allows users to exchange data and parameters remotely via a network of their choice.

The series has a compact and lightweight design with integrated LED display. It contains an IP67-rated enclosure to protect against water and dust and has a power consumption of 4 W or less.

With a sensitivity range of 0.2 kPa, linearity of $\pm 1\%$ or less and a hysteresis of 0.5% or less, the range is compatible with communication models such as CC-Link, DeviceNet, PROFIBUS DP, RS-232C and IO-Link.

SMC Australia | New Zealand

www.smcnz.com



Water and solids content monitor for the dairy industry

Using the latest microwave technology, it is possible to monitor the water or solid content of dairy products during production in real time, which enables early detection of deviations.

The Berthold measuring system provides continuous and real-time information on the current water content or dry matter of a wide range of dairy products. The measurement can be applied directly in the main stream, therefore a bypass is not required. The materials used, which are FDA and EHEDG approved, allow easy cleaning and are resistant to high temperatures, acids and bases. Furthermore, performance is not affected by colour, viscosity or inhomogeneity of the product.

Typical applications include: butter, cream cheese, margarine, yoghurt, curd and non-dairy plant-based alternatives.

Benefits include: multi-frequency technology for dynamic plausibility control of the raw signal; representative microwave measurement captures the entire pipeline cross-section; measurement < 0.2 wt.% (standard deviation); online monitoring of the water or solids content during production; CIP- and SIP-resistant materials; low-wear and maintenance-free.

The measurement system generates microwaves that interact with the water molecules due to their high dielectric constant. This interaction causes an attenuation of the microwave energy, which can be detected as phase shift and attenuation. Since the phase shift and attenuation change are directly proportional to the water content in the product, the concentration or solids content in the medium can be determined. The multi-frequency technology from Berthold is designed to ensure stable measurements, unaffected by interfering reflections or resonances from the measuring environment.



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Air-powered packaging system

Packserv's pneumatic packaging system is designed to improve safety and efficiency in production for the manufacturing sector.

Unlike conventional machinery, the system operates entirely on air pressure, making it entirely electricity-free.

By embracing pneumatic power, costly downtime associated with electrical failures or component breakdowns can be eliminated, which helps ensure uninterrupted production.

The system has also redefined the layout of production facilities. Traditionally, in some production facilities separate spaces were designated for different production stages due to electrical power requirements, leading to logistical challenges and inefficiencies. With the introduction of air-powered machines, all aspects of production can now coexist harmoniously in a single space. The sorting table, liquid filler, capper and batch sorting tables seamlessly collaborate, optimising speed and efficiency. Using the pneumatic production system, there's no need to shuffle manufactured goods throughout production — it can be streamlined and unified.

Safety is paramount, especially in industries where volatile substances are handled. The pneumatic machines are non-electrical, rendering them non-flammable and explosion-safe. This can provide enhanced worker safety and security in environments where electrical devices are restricted.

Packserv Pty Ltd
www.packserv.com.au



Pest control system

Rentokil Initial is introducing machine learning and AI automation to its pest monitoring units through the use of camera technology to identify pest behaviours as they happen.

To improve effectiveness of pest control solutions, Rentokil Initial's PestConnect devices will be upgraded and supported by in-built cameras. These cameras will recognise past behaviours and other factors impacting pest activity to provide insights driven by technology.

The system is designed to mitigate the risk of business closure by implementing an infrastructure of digital monitoring devices, offering 24/7 monitoring, which can be accessed remotely.

It also includes a risk mapping database that provides a predictive and proactive view of pest activity, by collating and analysing emerging trends through millions of data points.

In addition to mitigating risks of pests for businesses through constant monitoring and management, PestConnect offers a more sustainable approach to pest control. Using prevention rather than cure, the digital system allows the company to directly target certain types of pests, therefore reducing the unnecessary use of toxic solutions.

Rentokil Initial Pty Ltd
www.rentokilpestcontrol.com.au

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More haste, less waste: speeding up food testing



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A promising technology has been developed to speed up the process of testing bacterial viability in food products.

Researchers at Osaka Metropolitan University have developed a simple measurement technique that rapidly measures the number of viable bacteria in food products and reduces the inspection time from 2 days to about 1 hour.

Led by Professor Hiroshi Shiigi at the Graduate School of Engineering, Osaka Metropolitan University, the study focused on the electrochemical properties of tetrazolium salts (MTT), a water-soluble molecule, to develop

a simple method for evaluating viable bacterial counts, which are indicators of hygiene control at food and pharmaceutical manufacturing sites.

One of the most important assessment indicators for ensuring that food is free from contamination is the number of viable bacteria. However, conventional measurement methods take up to two days to yield results, and these results are usually only available after the food has been shipped from the factory. Therefore, speeding up the testing method of iden-

tifying bacterial contamination before shipment is an imperative measure to prevent possible food poisoning.

“With this method, we can quickly measure the number of viable bacteria, allowing us to confirm the safety of food products before they leave the factory and to prevent food poisoning,” Shiigi said. “This method does not require complicated operations or expensive equipment. Therefore, we will continue to optimise the measurement conditions and expect to see the development of a portable sensor in line with the development of research aimed at practical applications.”

The results of the research have been published in *Analytical Chemistry*.



Ultrasonic transmitter for non-contact level measurement

The Hawker MiniSonda Loop Powered Ultrasonic Transmitter for non-contact level measurement provides level measurement for liquids and slurries. It operates from a 20–38 VDC voltage, enabling the 4–20 mA signal produced to transmit over relatively long distances.

If four control relays, digital indication and a power supply are required use Flexilevel3 as a unit to add on. The FXL3 Flexilevel 3 indicator/controller is a wall-mounted level controller to IP66 that accepts a current 4 mA input from a sensor. It can span and zero the input signal, displaying the level depth or contents on the 9-mm-high programmable four-digit display. There are four programmable trip points which can be used as pump or valve control or alarms.

If only two relays and a power supply are required, use the Type 900 dual trip amp. The Type 900 is a dual-channel trip amplifier which accepts a signal from a vessel-mounted sensor and operates individual relays anywhere over its input range. Applications include pump and valve controls or high and low alarms. The four-digit display shows the real-time signal input in milliamps. An internal current limited power supply for a transmitter is available and a simple setting up procedure saves commissioning time. Low power consumption gives economical operation. Polypropylene casing provides increased chemical resistance.

AMS Instrumentation & Calibration Pty Ltd
www.ams-ic.com.au



5G device portfolio

Getac has released four rugged 5G devices in Australia and New Zealand: the V110 fully rugged laptop, S410 semi rugged laptop, F110 fully rugged tablet and UX10 fully rugged tablet.

The V110 fully rugged laptop has been engineered for the demands of Industry 4.0. It integrates the power of a 12th Generation Intel Core i7/i5 vPro processor and the visuals of Intel Iris Xe Graphics. It is housed in a robust frame, attaining MIL-STD-810H, MIL-STD-461G and IP65 certifications for performance in harsh conditions, from -29–63°C. It blends Thunderbolt 4 and advanced connectivity options, such as Wi-Fi 6E, Bluetooth 5.3 and optional 5G LTE.

The S410 semi rugged laptop has hot-swappable batteries. It houses 13th Generation Intel Core i5/i7 Processors and integrated Intel Iris Xe Graphics. The device incorporates PCIe NVMe SSD as a standard, coupled with user-removable storage for heightened task efficiency. It also has a laser barcode reader, a DVD/Blu-ray super multi drive, a second storage drive and the option of a third battery.

The UX10 fully rugged tablet is designed for medical professionals and features fully sealed buttons for quick and easy disinfection. Its fully rugged IP66-certified design offers protection against dust, water and disinfectant spray.

The F110 fully rugged tablet allows workers to operate under a wide range of challenging conditions. It is powered by a quad-core 11th Generation Intel Core i5/i7 processor. Its Intel Iris Xe Graphics are easy to use and see even when visibility is limited. It also has enhanced connectivity options to deliver rapid data transmission from any location with the added Thunderbolt 4 port offering a 40 Gb/s connection.

Getac Technology Corp

www.getac.com

Thermal protection gloves

Safetyware's Cryogenic Gloves are made from a multi-layer, anti-cold material that is designed to



provide good thermal protection for extreme cold environments down to -250°C while also having good flexibility and dexterity.

With a waterproof liner and high thermal insulation to wick moisture away, the gloves can maintain comfort for the user over extended periods.

Suitable for use in cleanrooms, including Class 1000, the gloves can be used in frozen food processing applications. Other applications include biomedical, genetic technology, laboratory research, liquid nitrogen, industrial and LNG filling stations.

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90% recycled plastic in KitKat packaging



KitKat Australia has increased its use of recycled plastic in the wrappers of select products to 90% — cutting 1,200,000 m² of virgin plastic each year. The 90% recycled plastic is allocated using the ISCC mass balance approach.

Andrew Lawrey, Nestlé General Manager Confectionery, said, “It’s critical that our packaging keeps KitKat safe and fresh and delivers that delicious snap consumers love. While recycled plastic suitable for soft plastic food wrappers continues to be scarce, we will keep working closely with our suppliers to transition as quickly as possible.”

The wrappers will be used on the classic KitKat and KitKat Gold 4-finger bars, KitKat Chunky Aero Mint bar and classic KitKat block.

The update builds on KitKat’s move last year to wrap its food in soft plastic made with 30% recycled plastic using a mass balance approach, which has seen more than 40 million KitKat 4-finger bars wrapped with 30% recycled plastic since.

Margaret Stuart, Nestlé Oceania Director of Corporate Affairs and Sustainability, said the company is on a mission to cut its virgin plastics

use by a third by 2025.

“We hope this wrapper does more than just reduce virgin plastic use. We hope it’s a reminder of the circular potential for soft plastics. We all know the disappointment of not being able to recycle our soft plastics right now, but we’ve designed our wrappers so that where collection is available, they can be recycled,” Stuart said.

Nestlé is continuing to work with industry and the value chain to see a future where used plastic can be collected and recycled in Australia.

Nestlé is planning to introduce food-grade soft plastic wrappers made with recycled plastic to further product ranges as global availability increases.

NEWS

Clear lids on milk bottles

Woolworths is making the switch from coloured lids to clear lids on its own brand milk to make recycling easier. The lids have already started popping up in some Victoria, NSW and Queensland stores and are expected to fully roll out by early next year.

The change will mean the lids, which are currently dark blue or light blue, can be recycled into a greater variety of new products — unlike coloured plastic which has fewer uses when recycled. It means up to 290,000 kg of plastic from millions of milk bottles will be more effectively recycled each year.

Coloured plastic currently needs to be separated from clear plastic during recycling. Coloured plastic can presently be recycled but its pigments make it less versatile as it can only be recycled into dark coloured plastic. Clear plastic leads to better quality recycling, allowing the lids to be turned back into clear or coloured plastic, meaning it could potentially be used to make a new milk bottle.

To boost recycling, customers can follow these three important steps:

1. Crush the milk bottle by stepping on it with shoes on.
2. Screw the lid on the milk bottle to ensure it doesn’t get discarded during recycling.
3. Place it in the yellow recycling bin at home.

These instructions are included on a label on the bottle.



Will Herron, Woolworths Dairy Merchandise Manager, said, “This small change will lead to better recycling for millions of milk bottles once it rolls out across our range.”

Australian Packaging Covenant Organisation (APCO) CEO Chris Foley said, “Small changes like this stack up to help recycled material go into a greater variety of new products, and we hope to see more companies follow this move.

“Customers should always look for the Australasian Recycling Label logo on their Woolworths brand milk and other supermarket products for easy-to-follow instructions to ensure their packaging ends up in the right place.”

Woolworths’ own brand cream and bottled water are also set to feature clear caps. This change has already taken place across Woolworths’ yoghurt pouches.

Fast settling hotmelt

Henkel has launched one of the Technomelt Supra ECO range products into the Australia and New Zealand market. As the name suggests, TECHNOMELT Supra 081 ECO is made of 81% bio-based material using a mass balanced approach, while delivering Technomelt Supra and Food Safety Performance, with technical properties similar to TECHNOMELT Supra 100.

The adhesive range provides a full traceability of the CO₂ footprint and the sustainable sourcing of raw materials, thanks to a mass balance approach certified under ISCC PLUS. Mass Balance Transfer refers to the tracking of material in flow and out flow of a closed production system, ensuring a certain amount of bio-based material entering and leaving the process.

It is designed to help companies move to a negative footprint. At an average consumption of 100 tons per year, the carbon footprint of a standard polyolefin hotmelt adhesive amounts to 328 tons of CO₂ per year. This equals 164 tons of burned coal or 71 passenger cars driven for a full year. At the same rate of consumption, TECHNOMELT Supra 081 ECO will result in a carbon negative footprint of -44 tons of CO₂/pa. This saving of 372 tons of CO₂ per year equals the carbon sequestered by more than 6100 tree seedlings grown for 10 years.¹

1. Reference product: Supra 100, Cradle-to-Gate Life Cycle Assessment

Henkel Australia Pty Ltd

www.henkel-adhesives.com



High-barrier paper-based packaging

Mondi is expanding its FunctionalBarrier Paper range with FunctionalBarrier Paper Ultimate, an ultra-high-barrier paper-based solution for food, to meet demand for sustainable packaging.

The range is designed to be recyclable in paper waste streams across Europe while providing the necessary product protection from water vapour and oxygen. It is suitable for food products such as dried foods and powdered milk, as well as for home and personal care applications.

Industrial-scale production of the FunctionalBarrier Paper Ultimate range is expected in the first quarter of 2024.

Mondi Group

www.mondigroup.com/en/home/

Listeria Detected in 25g

To minimise this risk FMCG Industry Solutions is now offering a new unique anti-listeria product called **PhageGuard Listex**.

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CASE STUDY

Sustainable pasta packaging rolled out



SABIC has rolled out a novel pasta packaging project as part of its TRUCIRCLE program to accelerate the circular plastic economy. Garofalo, an Italian pasta manufacturer, has introduced the packaging made by GT Polifilm and Polivouga using SABIC's certified circular polypropylene (PP). The material is derived from advanced recycling and converted into a biaxially oriented polypropylene (BOPP) film for this application, which contains 30% post-consumer recycled (PCR) content.

The PCR content in the bags is based on used plastics, which is then turned into pyrolysis oil in an advanced recycling process. The oil is then used in the production of new polymers with the same specifications as virgin plastics from conventional feedstock. Polivouga, a flexible film manufacturer, then produces the basic BOPP film for the pasta packaging. GT Polifilm, a specialist in the production of flexible polypropylene products for automated packaging in the food industry, adds a cast PP film to the BOPP film to create a mono-material structure, which is then converted to tailor-made pasta bags. The bags, once used, can be recycled again in existing PP waste streams.

Abdullah Al-Otaibi, General Manager, ETP & Market Solutions at SABIC, said these solutions will only work in the long term if the companies involved in creating them continue to collaborate.

Flexible plastic packaging is a sustainable alternative to traditional packaging; however, a lot of food items are packaged in paper/plastic combinations or laminates which are difficult to recycle and may have a bigger carbon footprint due to higher resource consumption.

Ragionier Talamo, Sole Director at GT Polifilm, said, "The incorporation of recycled content has been a key area of focus for us over the past few years. By supporting the circular economy, adding value to plastics and promoting their recycling into new packaging products, we hope to make a significant contribution to solving the enormous challenge of improving recycling rates and minimising plastic waste."

Tiago Barros, Executive Manager at Polivouga, said, "As a producer of flexible films, we are well aware of our responsibilities in turning our own and our customers' sustainability goals into reality, and we are very committed to the challenge. Our new BOPP product demonstrates the determined journey we have embarked on with SABIC. We welcome the advanced recycling route offered by SABIC as an opportunity to make a meaningful contribution to the circularity of plastics in BOPP films. In collaboration with strong global partners, this breakthrough project is demonstrating the feasibility of reusing plastic waste in safe food-grade packaging rather than losing its value to landfill or incineration."

SABIC's TRUCIRCLE portfolio also includes design for recyclability, mechanically recycled products, certified renewable polymers from bio-based feedstock and closed loop initiatives to recycle plastic back into high-quality applications and help prevent valuable used plastics from becoming waste.

A sample of this first mono-PP pasta packaging material was displayed at Interpack 2023.

istockphoto.com/Vuy Sanyuk



Edible packaging

istock.com/Stefanikolic

Scientists at The Chinese University of Hong Kong (CUHK) have developed an edible, transparent and biodegradable material with considerable potential for application in food packaging.

The team at CUHK studied bacterial cellulose (BC) — an organic compound derived from certain types of bacteria that has garnered attention as a sustainable, easily available and non-toxic alternative solution to plastics.

Professor To Ngai from the Department of Chemistry, CUHK and corresponding author of the study explained that the tensile strength and high versatility of BC are the key to its potential as a replacement for single-use plastic packaging materials.

Unlike the cellulose found in the cell walls of plants, BC can be produced through microbial fermentation, which eliminates the need for harvesting trees or crops. Ngai noted that as a result, “this production method does not contribute to deforestation or habitat loss, making BC a more sustainable and environmentally friendly material alternative to plant cellulose”.

Up until now, the widespread adoption of BC has been limited by its unfavourable sensitivity to moisture in the air (hygroscopicity), which detrimentally impacts its physical properties.

In the recent paper, published in the *SCI Journal of the Science of Food and Agriculture*, the researchers at CUHK described their novel approach to addressing the limitations of BC-based materials. By incorporating certain soy proteins into the structure and coating it with an oil-resistant composite, the scientists successfully created an edible, transparent and robust BC-based composite packaging.

Ngai noted that this approach has a high feasibility for scale-up. “It does not require specific reaction conditions like chemical reactions, but rather a simple and practical method with mixing and coating,” he said.

“This approach offers a promising solution to the challenge of developing sustainable and environmentally friendly



Image credit: To Ngai



Image credit: To Ngai

packaging materials that can replace single-use plastics on a large scale.”

The study demonstrated that the plastic alternative could be completely degraded within 1–2 months. Unlike other bio-derived plastics such as polylactic acid, the BC-based composite does not require specific industrial composting conditions to degrade.

Ngai said: “The material developed in this research is completely edible, making it safe for turtles and other sea animals to consume without causing aquatic toxicity in the ocean.”

The researchers at CUHK are now exploring the directions for future research. They hope to enhance the versatility of modified BC films, making them suitable for a wider range of applications. Specifically, they are focused on developing a thermosetting glue that can create strong bonds between bacterial cellulose, allowing it to be easily moulded into various shapes when heated.

“One of the main challenges with bacterial cellulose films is that they are not thermoplastic, which limits their potential for use in certain applications. By addressing this issue, we hope to make bacterial cellulose films more competitive with traditional plastics while maintaining their eco-friendliness,” Ngai said.

CASE STUDY

Paper sleeve to wrap fizzy drink



Coca-Cola HBC Austria has worked together with Mondi to create a paper sleeve packaging solution for its 1.5 L PET multi-packs of the Coca-Cola, Fanta, Sprite and Mezzo Mix brands sold in Austria.

The Hug-IT sleeve is designed to replace existing plastic shrink wrap, using paper made from responsibly sourced fibres as a more sustainable solution.

Made of Mondi's Advantage SpringPack Plus paper, the sleeve has high tensile strength and good stretchability so it can wrap six bottles tightly and keep them together and upright during transportation.

Advantage SpringPack Plus is 100% kraft paper made from wood that is FSC Certified as being made with responsibly sourced fibres, and recyclable in existing paper recycling streams.

The solution has taken three years to complete, from conception through to planning, trialling and getting the product onto shelf. Its development involved a number of Mondi's divisions and cross-segment collaboration, making the most of the company's expertise in paper packing and converting, and creating more sustainable solutions.

The sleeves are engineered on automated machinery provided by Krones.

Mondi Group

www.mondigroup.com/en/home/

CASE STUDY

Aseptic packaging for coconut milk

A coconut snack food maker in China has chosen Sidel's Aseptic Combi Predis to enable it to expand into the beverage market through the production of its coconut milk.

Established as a coconut food snack maker, Hainan Chunguang Foodstuff Co launched its coconut milk on the market in 2022. The Sidel aseptic solution was chosen as it provided a complete service provision across the entire line and had the ability to use dry technology over traditional wet aseptic solutions, which allowed the manufacturer to meet economic and environmental sustainability targets.

Based on Hainan Island, also known as Oriental Hawaii where coconuts are naturally grown and sourced as a raw material, Hainan Chunguang is able to produce coconut milk, from plant to bottle, locally.

Bottled in Sidel's PET design in a 350 mL format, Hainan Chunguang's installation can run 28,000 bottles per hour (bph) and adds to the 100+ aseptic line installations previously placed across Greater China.

The packaging solution is suitable for sensitive products, especially those made of natural ingredients such as coconut. Sidel's Predis aseptic filling solution, with dry preform decontamination, uses hydrogen peroxide mist for packaging sterilisation, which is designed to ensure product integrity, production flexibility, cost efficiency and sustainability. Using no water in the process and only a small amount of chemicals to decontaminate the preform, the Predis is designed to ensure a safe product with increased shelf life.

Xin Yan, Hainan Chunguang Board Member, said the company's decision to move into the beverage market in 2020



was the result of many years of preparation, including product development and identifying technical resources needed to deliver the product.

"As this was the first time that Hainan Chunguang had expanded to the market of sensitive beverages, expertise and proven results played significant roles in identifying a partner to engage with for the installation of this solution.

"We have been very satisfied with the service we have received from Sidel from the point of engagement to aftersales support."

Min Xianglong, Sidel Account Manager, said sustainability and total cost of ownership were significant factors in Hainan Chunguang's decision to choose the Sidel solution.

"Sidel's dry solution addresses and benefits both of these issues. We are happy to have been able to work alongside our customer in their first venture into aseptic packaging and pleased that we have satisfied the company through performance across both machine installation and project delivery. We hope this is the first in a line of projects working with Hainan Chunguang," Xianglong said.

Sidel Oceania Pty Ltd

www.sidel.com

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Scientists develop sensor to detect honey adulteration

In a sweet world of honey, adulteration is a bitter truth. Honey is often purchased for its purity and health benefits, but it sometimes contains hidden additives, most commonly water.

Standard methods to detect honey adulteration can be expensive and can have complicated operation methods or low accuracy.

In *Review of Scientific Instruments*, from AIP Publishing, a team of scientists from the Nanjing University of Aeronautics and Astronautics and the Hebei University of Technology developed a microwave microstrip line planar resonator sensor tool to detect water adulteration in honey. The compact tool is designed to be cost-effective and easily fabricated.

The sensor is fabricated on a dielectric substrate, which is an insulator that can support electrostatic fields, such as ceramic or glass. There are three thin copper strips on top, separated by two gaps. The length of the middle strip and the electric field intensity at the gaps determine the resonance frequency of the device.

According to author Zhen Li, water changes how the electromagnetic field around honey behaves. "When placed in the sensor, adulterated honey shifts the sensor's resonance frequency. By measuring this shift, we can detect water adulteration in honey," Li said.

The team tested honey samples with varying water content. They found that the sensor's resonance frequency consistently decreased with increased added water content.

The device could inspire further applications in liquid analysis, in industries such as food quality control, pharmaceuticals and petrochemicals, for detecting impurities or composition changes, potentially advancing sensing technology.

"We aim to extend our research to detect adulteration in other liquid products and develop more sensitive sensors for broader applications in quality control and food safety, starting with the impact of temperature on our sensor's performance," Li said.

iStock.com/AndreyCherkasov



Clean-label caramel colour range

Oterra has launched its Simply Brown range, which is crafted from apples to create clean-label caramel replacement solutions as part of its FruitMax colouring food range.

While caramel has long been a food colouring staple, changing consumer preferences show the need for clean brown replacements.

Oterra's Simply Brown range, which includes four products, a powder and liquid for human consumption, and two pet products, is designed to meet this demand by using a gentle cooking process that results in rich, stable natural brown shades without unwanted caramelisation.

Suitable for bakery, cereal, snack and savoury applications, the range is gluten-free, and devoid of 4-MEI and sulfites.

It can also be used in dairy applications, as it is designed to deliver a chocolate milkshake appearance without interfering with other proteins and minerals in the mixture.

Oterra Australia Pty Ltd

oterra.com

Canopy hoods

Island Canopy Hoods are suitable to locate over peninsulas and are designed to collect and exhaust corrosive vapours, heat, steam and odours when mounted



over areas with water baths, hot plates or portable equipment.

Manufactured of moulded one-piece composite resin, canopy hoods are lightweight and can be wall-mounted or suspended from the ceiling. The canopy fume hood's glass-smooth surfaces provide chemical, corrosion and heat resistance. Optional side panels prevent cross drafts and further improve airflow while providing a way to contain chemical spills.

HEMCO Corporation

www.hemcocorp.com



APPEX coming to Melbourne in March 2024

APPEX, Australia's premier Processing and Packaging Expo, is coming to the Melbourne Convention and Exhibition Centre from 12–15 March 2024.

Previously known as AUSPACK, APPEX 2024 is set to be Australia's largest event in the country for manufacturing, retail and distribution to source the latest in machinery, equipment, materials & packaging, food processing and industry services.

Owned and presented by APPMA, the Australian Packaging and Processing Machinery Association, APPEX is built on a strong foundation laid by 35 years of successful AUSPACK exhibitions and is set to represent the entire processing and packaging industry, uniting all sectors for a comprehensive exploration of innovation and collaboration.

With experience and learnings from international events, on-the-floor special features and activities, APPEX promises to deliver a unique and valuable experience not previously seen in Australia.

Taking over the entire 20 bays of the Melbourne Convention and Exhibition Centre, the exhibition will be divided into zones to assist visitors in navigating the products and services they are looking for:

- IT & Services
- Materials & Packaging
- Packaging Machinery
- Packaging & Processing Machinery

In addition to the main exhibition, APPEX will feature a series of educational and networking events throughout the four-day event. One standout is Meat Industry Day, which is a dynamic collaboration between three key industry partners, including the Australian

“As a supplier of both packaging and processing equipment, these are great changes that will bring the whole machinery sector in Australia together. We are looking forward to APPEX 2024.” — Andrew Hutchinson, Managing Director at Multivac Australia.

Meat Industry Council (AMIC), the Australian Meat Processor Corporation (AMPC) and Meat & Livestock Australia (MLA).

Coming together during APPEX 2024 on Wednesday, 13 March, Meat Industry Day promises a curated blend of educational content, a showcase of cutting-edge processing and packaging technology, and the latest industry developments. It provides a unique opportunity for both sectors to forge connections, foster development and engage in business activities including an exclusive networking event.

For those seeking knowledge and insights, the APPEX Seminar Theatre will host daily educational sessions from industry leaders and businesses each day:

- including sessions from the team at Robotics Australia, exploring the role and future of robotics in processing and packaging for manufacturers;
- as well as the new F&B focused sessions, in the 'Food Industry Solution Series', which will cover key topics for food and beverage manufacturers.

An integral part of APPEX 2024 is the APPMA Awards of Excellence Gala Dinner. Held on Wednesday, 13 March, the night will bring together 700+ industry guests for an evening of inspiration, celebration, entertainment and networking opportunities.

Run by APPMA, the Awards of Excellence recognises excellence, innovation, leadership and best practice in the Australian packaging and processing industry.

The Awards of Excellence will acknowledge achievements in various categories, including Emerging Leader, Digital Innovation, Sustainability Excellence, Packaging Design Innovation, Customer Systems Integration, Australian Machinery Manufacturer (SME and Corporate) and Import & Distribution Machinery (SME and Corporate).

APPEX 2024 stands out as a must-attend event for industries across packaging, processing and manufacturing. More than just an expo, it represents the future of the processing and packaging sector. Notably, APPEX will move to a three-year rotation, with its next return to Melbourne scheduled for 2027.

Registrations for APPEX 2024 are set to open in mid-November, inviting industry professionals to secure their place at Australia's largest event shaping the future of the processing and packaging industry.



APPEX 2024
www.appex.com.au

NEWS

Colour-changing tech for plant-based meat

Plant-based protein company v2food has revealed its new colour system for plant-based meats. The technology, known as RepliHue, will change the colour of plant-based meats through the cooking process, mimicking animal meat and creating a generation of 'bleeding' plant-based proteins.

Most plant-based proteins often remain the same colour prior to and following being cooked. RepliHue is designed to change colour at the same time and temperature as animal meat does, creating a more 'normalised' experience for those cooking with plant-based meats.

The product is derived from red algae and plants. The algae are produced sustainably, consuming carbon dioxide and using light for energy.

The technology was revealed at Sydney's South by Southwest, an expo to spotlight innovation in technology. Audience members saw the cooking process and tasted samples of the product, presented by Chefs Miguel Maestre and Neil Perry.

At the event's 'Discovery Stage', v2food, alongside Australian food tech company Nourish, presented the following technology:

- v2food revealed RepliHue.
- Nourish Ingredients revealed Tastilux, a fat that will make plant proteins deliver the same taste, smell and experience as animal meats.

Tim York, v2food CEO, said RepliHue incorporates multiple advancements in the texture, flavour and colour of meat alternatives.

v2food has developed RepliHue solutions for beef, pork and chicken under the RepliTech science & technology platform, and is hoping to commence retail distribution in 2024. The technology co-invention and development of RepliHue has been conducted along with CSIRO, UTS C3 Facility and Lgem.



Cooked RepliHue burger.

NEWS



Crafting next-generation dairy products

Australia's Food and Beverage Accelerator (FaBA) is planning to develop next-generation milk, cheese and yoghurt ingredients using precision fermentation.

A team led by Associate Professor Esteban Marcellin from The University of Queensland's Australian Institute for Bioengineering and Nanotechnology (AIBN) will work with industry partner All G Foods developing 'nature-identical' proteins for dairy ingredients and products.

FaBA Director Dr Chris Downs said the four-year project represents the future of food and beverage manufacturing. Nature-identical dairy proteins allow scientists to replicate the ingredients of foods, providing

an opportunity to add value to food and beverage products and position Australia as a global leader in an emerging area.

"FaBA is delighted to be working with industry partners to develop ingredients and products that will make their way into pantries and fridges across Australia and be exported to major international markets," Downs said.

Jan Pacas, CEO of All G Foods, said the FaBA project would develop high-value dairy ingredients such as Lactoferrin, as well as products that consumers expect.

The precision fermentation process is anticipated to yield highly efficient microbial strains capable of producing nature-identical dairy proteins, which can be used to craft dairy products that mirror the functionality of traditional dairy.

"This technology offers Australia a unique market opportunity in an emerging industry with the potential for a substantial commercial impact, especially the ability to supply the Asia-Pacific region," Pacas said.

According to Downs, this project will be the first of many to be supported by FaBA, which has \$50 million in federal investment and an additional \$100 million being secured from industry and research participants.

"To allow the industry-led Food and Beverage Accelerator to address the challenges businesses face today, we need to listen and respond so we can help build the industry of tomorrow," Downs said.

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



Beer aroma study

iStock.com/Rouzas

Hop-derived constituents can not only increase shelf life and bitterness of beer, but can also have a significant influence aroma.

Under the leadership of the Leibniz Institute for Food Systems Biology at the Technical University of Munich, a team of scientists has disproved a roughly 20-year-old assumption about the linalool odourant, which has a floral and citrus-like scent. The new study contributes to a better understanding of changes in beer bouquet during the brewing process and beer aging.

Two molecular variants of the odourant linalool are found in hops and beer: the enantiomers (R)- and (S)-linalool. Both molecules consist of the same number and type of atoms, and show the same connectivity. Nevertheless, they have a different spatial structure and differ like an image from its mirror image. This ‘small’ but nevertheless crucial difference is also reflected in different odour intensities of the molecules.

In addition, it has long been known that beer aroma changes during the brewing process and storage because, among

other things, part of the (R)-linalool predominant in hops is converted to (S)-linalool. Previously, based on a 1999 paper, researchers assumed that the odour threshold concentration of (R)-linalool is about a factor of 80 lower than that of (S)-linalool. Put simply, they assumed that (R)-linalool has a much stronger influence on beer aroma than its mirror-image counterpart. However, data on the odour thresholds of both substances were lacking.

To close this knowledge gap and enable more precise predictions of changes in beer aroma, the team led by brewing and beverage technologist Klaas Reglitz and food chemist Martin Steinhaus from the Leibniz Institute first optimised a preparative method. In close cooperation with the Research Center Weihenstephan for Brewing and Food Quality, the researchers thus succeeded in isolating enantiomerically pure (S)-linalool.

Having the pure substance available in sufficient quantities helped to determine the specific odour threshold concentrations of the two odourant variants in water and unhopped beer using a trained sensory panel. This was essential because

only (R)-linalool is commercially available as a pure substance.

As the team showed, the thresholds of (R)- and (S)-linalool in water were 0.82 and 8.3 micrograms per kilogram, respectively. In unhopped beer, the team determined thresholds of 6.5 micrograms per kilogram for (R)-linalool and 53 micrograms per kilogram for (S)-linalool.

“Our results thus confirm the previously postulated higher odour potency of (R)-linalool. However, they also refute the previous assumption that the odour threshold concentrations of the two enantiomers differ extremely. Instead, the study shows that the difference is only about eight- to tenfold,” said Martin Steinhaus, head of Section I and the Food Metabolome Chemistry Research Group at the Leibniz Institute.

First author Klaas Reglitz said, “The conversion of (R)- to (S)-linalool thus does not have as great an influence on beer aroma as has long been assumed. Thanks to our study, we now better understand how and why the aroma changes during storage.”

The research has been published in *Brewing Science*.

What's new



Frozen snack foods

SPC is entering the frozen snacks category for the first time with the launch of its Street Eats brand. The Street Eats range of snacks will deliver convenient frozen mealtime experiences. Its first foray into frozen snacks will be Street Eats Mexican Style Chicken Chipotle Quesadillas and Street Eats Mexican Style Beans & Cheese Quesadillas.

www.spc.com.au/

Lollipop-flavoured beverage

Asembl has created a collaboration between Perfetti Van Melle's Chupa Chups brand and boba franchise Chatime. The collaboration will see Chupa Chups' lollipop flavours Grape and Strawberry & Cream turned into boba-inspired beverages.

www.asembl-brands.com/index.html



100th Anniversary wine

Grant Burge Wines is celebrating the 100th anniversary of a Barossa vineyard with the launch of the limited edition Filsell 100 Shiraz. Crafted from fruit from the 100-year-old vines at the Filsell Vineyard, this premium Shiraz is limited to just 6000 bottles. It has a rich aroma with notes of Kirsch, hazelnut and nutmeg, and tasting notes of cherry chocolate fruit, damson plum, spice and espresso.

www.grantburgewines.com.au/

Fruit sorbet snack

Frosty Fruits has launched the Frosty Fruits Fruit Stack, a sorbet stick with flavours of strawberry, orange and green apple. It is available in grocery stores and petrol/convenience stores.

www.peters.com.au/brands/frosty-fruits/



Melbourne-blend chai

Calmer Chai is releasing a 'Melbourne Blend' to celebrate the influence chai has made on the city. Previously known as Calmer Sutra Tea, this release comes as part of Calmer Chai's rebrand, to stay up to date with Melbourne's adapting beverage scene.

www.calmerchai.com.au/

Plant-based yoghurt

Vitasoy has released a range of Oat Yoghurts, available in three flavours including Blueberry, Vanilla and Summer Fruits, which includes a blend of mango, guava, passionfruit and pineapple.

www.soy.com.au



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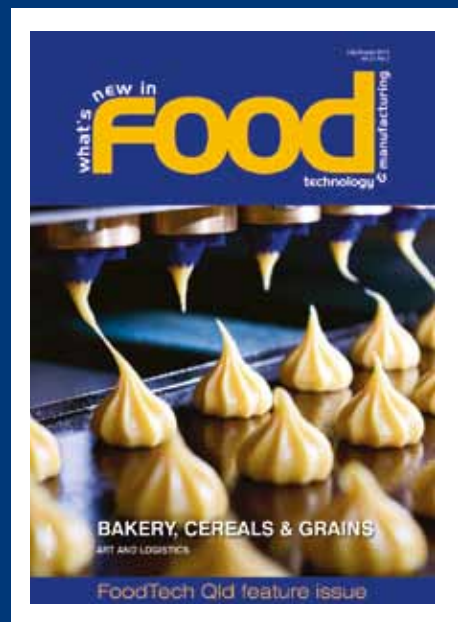
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