July/August 2022
Vol.30 No.2

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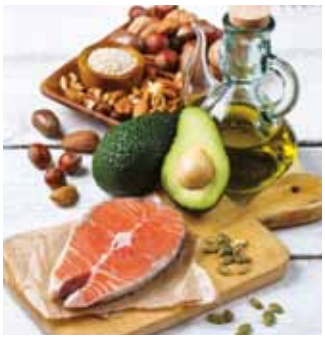

READ ONLINE!

This issue is available to read and download at

www.foodprocessing.com.au/magazine

'Lettuce' deliver on food traceability: new guide released

The origin of the food we consume has become increasingly important to consumers and industry alike. Significant supply chain interruptions around the world, coupled with extreme flooding within Australia, has resulted in a shortage of fresh produce, including organic, driving up prices and frustrating shoppers who may not realise why the shelves at the local supermarket are empty or when to expect the next lettuce delivery.

'The Australian Guide to Implementing Food Traceability: Organic Produce' is a user-friendly how-to guide for tackling traceability across the organic produce supply chain. It was developed by Deakin University's Food Traceability Laboratory in partnership with industry partners Woolworths Group and GS1 Australia.

"Produce is an increasingly important part of Australian food supply, and we developed this guide to give Australia's organic farmers assurance that their product is handled well and remains in premium condition as it makes its way to local retailers or to overseas markets," said David Downie, Chair of Deakin's Food Traceability Laboratory.

"Now more than ever, food traceability is crucial. Consumers want to know the origins of produce from farm to fork, why there may be a shortage, if a product is recalled and, with a notable increase in sales of organic produce since the start of the pandemic, it is vitally important that accurate traceability information is available every step of the way."

The guide is one of three developed by Deakin to assist Australian businesses to be able to achieve end-to-end traceability.

Traceability supports the tremendous effort growers put into their premium certified organic products as they are delivered to consumers in an increasingly complex food supply chain that is now both global and inherently dynamic. Visibility along the supply chain improves the speed and accuracy of food recalls and it's a cornerstone of actions to curb threats of substitution or contamination in storage or distribution.

Australia's fresh produce organics industry contributes approximately $2.6 billion to the Australian economy each year and the market is projected to continue to grow. Australia is also the world's largest holder of agricultural land under certified organic management, with over 23 million hectares of soil now organic.

Nicole Villiers, Head of Business Solutions at Woolworths Group, said: "For the organics market generally, and particularly for fresh produce, trust is an imperative. The pandemic has only increased consumer interest in having greater visibility over where their food originates and how it's grown."

Joanna Bunting, Future Traceability for Agricultural Trade Principal Director, said: "Traceability is not just about the origin of the product, but what happens to the product as it moves through the chain. Accurate and timely traceability systems show consumers that Australian products are safe and sustainable from paddock to plate, driving our access to premium international markets."

'The Australian Guide to Implementing Food Traceability: Organic Produce' and other guides are available for download free from Deakin University's Implementing Food Traceability website.

How Nitrogen Generators are used in the food and beverage industry

Companies that generate their own nitrogen in-house with a nitrogen gas generator enhance production flexibility by ensuring they have the nitrogen they need, at the level of purity they need, when they need it.

Nitrogen gas is inert, colourless and odourless. It's widely used in food and beverage packaging as a non-chemical preservative because it can displace oxygen—the main culprit in the air that causes spoilage.

Oxygen reacts with compounds like fat and sugars, producing a natural process (oxidation) that creates unpleasant odours and spoilage in food.

Ever notice how an apple turns brown after it has been bitten?
That's oxidation taking place. Replacing oxygen in the packaging atmosphere with nitrogen helps prevent oxidation. Nitrogen preserves freshness, protects nutrients, and prevents growth of aerobic microbes.

Packaged foods that benefit from the use of nitrogen include *fatty meats, fish, nuts, coffee, vegetables and ready-to-eat products.*

Ever notice how a new bag of potato chips seems partially filled with air?
It's not air. It's nitrogen gas. During the packaging process, nitrogen pushes the oxygen out of the bags, extending the shelf life of the product. It also provides a cushion that protects the integrity and quality of the chips.

Other applications of nitrogen in food processing including fluffing, head space replacement, blanketing of process operations to prevent unwanted combustion, and pest control and fumigation.

Benefits of using nitrogen within Food & Beverage several applications:

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Food for thought

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Researchers develop spray-on food wrap

Scientists have developed a biodegradable, plant-based coating that can be sprayed on food as an alternative to plastic packaging. The antimicrobial food-safe spray uses starch-based fibres to protect food from spoilage and prevent damage during transport.

The finding came about from Harvard University and Rutgers University researchers looking for more sustainable ways of keeping foods fresh.

"We knew we needed to get rid of the petroleum-based food packaging that is out there and replace it with something more sustainable, biodegradable and nontoxic," said Philip Demokritou, Director of the Nanoscience and Advanced Materials Research Center, and the Henry Rutgers Chair in Nanoscience and Environmental Bioengineering at the Rutgers School of Public Health and Environmental and Occupational Health Sciences Institute. "And we asked ourselves at the same time, 'Can we design food packaging with a functionality to extend shelf life and reduce food waste while enhancing food safety?'

"And what we have come up with is a scalable technology, which enables us to turn biopolymers, which can be derived as part of a circular economy from food waste, into smart fibres that can wrap food directly. This is part of new-generation, 'smart' and 'green' food packaging."

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Nestlé to acquire NZ supplements and honey brands

Nestlé Health Science has agreed to acquire The Better Health Company (TBHC) in its entirety, including its supplement brand, GO Healthy, and Manuka honey brand, Egmont, as well as its manufacturing facility based in Auckland. The New Zealand Health Manufacturing facility for vitamins minerals and supplements will allow Nestlé Health Science to develop new products with regional considerations in mind.Nestlé Health Science's Head of Oceania, Asia, Middle East & Africa region Paul Bruhn said that the acquisition is a strategic fit for Nestlé Health Science."GO Healthy and Egmont are trusted brands with a track record of strong growth which complement our global portfolio of active lifestyle and health & wellness nutrition brands very well. We also see the opportunity to accelerate growth in the region through the manufacturing facility in Auckland, which will enable us to bring new products to local markets faster." The transaction to acquire TBHC is set to be finalised by the end of 2022. It is subject to regulatory approval and financial details are not being disclosed.

Alcohol energy labelling

Food Standards Australia New Zealand (FSANZ) has begun work on a proposal to change the regulations for how alcoholic beverages are labelled, with packaging in the future possibly set to feature a minimised nutrition information panel with the amount of energy in an alcoholic drink featured prominently.

The proposal comes after a report into the possibility of alcohol's energy content being featured on its packaging was released in late 2021. The report, Energy labelling of alcoholic beverages, describes how and why alcohol packaging might include its energy content. Unlike most other packaged foods and beverages, alcohol is currently not required to have this information on its labelling. The report noted that this can make it difficult for consumers to make informed choices in regards to dietary considerations. After consultation with industry, public health, consumer and jurisdictional stakeholders, it was agreed that mandatory energy labelling would be a suitable way to address this concern.

The proposal is underway but still in its early stages, with a call for public comments expected after September 2022.

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Sweet deal for Victorian chocolate factory

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The Philip Island Chocolate Factory is being supported by theVictorian Governments' *Business Competitiveness Program*, which will allow it to increase its production capacity.

"We're supporting businesses like the Phillip Island Chocolate Factory to expand and become more competitive because it drives growth and creates local jobs," said Victoria's Minister for Industry Support and Recovery Martin Pakula.

The funding will bring in new machinery to boost production capacity of the factory from 35 tonnes a year to 550 tonnes — that's an increase of almost 16 times and means that the chocolate equivalent of one Airbus A380 or over 100 Indian elephants will be made each year.

"We are passionate about chocolate and the support from the Victorian Government allows us to share our passion with more people from around the world and treat them to some Phillip Island sweetness," said Panny Letchumanan, owner of the Philip Island Chocolate Factory.

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Australian winemakers can now access an online tool to help them target the United States market thanks to the Australian Government's Agricultural Trade and Market Access Cooperation (ATMAC) grants program, a component of the Agribusiness Expansion Initiative (ABEI).

The USA Wine Market Tool is a jurisdictional map that can be filtered by wine laws, market structure, channel availability and wine producer preference, highlighting US states based on filters including tiers of pricing opportunity, commercial opportunity, information about legal constraints on alcohol sales, direct-to-consumer models and distribution structure by state.

"The US market holds great potential for Australian winemakers, but it is not an easy market to crack," said Tony Battaglene, Chief Executive of Australian Grape & Wine. "Businesses looking to export into the USA need to look at it as not a single wine market, but rather 51 market opportunities, each requiring a unique approach to sales and distribution.

"This tool is a new concept for exporters as it shows the whole of the USA with state boundaries, commercial features, population, visa and household income trends overlayed with wine buyer information and purchasing conditions in each state. Wine businesses can now search, with confidence, the most suitable jurisdictions to suit their business and product offering."

Nikki Palun, from Susuro Wines, said: "This is a really powerful tool for any winery wanting to enter the US market. It's really easy to use and has given me deep insights that would normally be out of my reach from a cost perspective."

Absolut to launch fibre-based bottle cap

The Absolut Company has announced that it is working with Swedish start-up Blue Ocean Closures (BOC) to develop a fibre-based bottle closure cap for Absolut Vodka.

The cap is made from sustainably sourced FSC fibre material with a thin top-seal barrier label and serves to reduce the amount of plastic used in packaging. Recycled as paper and ocean biodegradable, the cap is being developed to be used on current glass bottles alongside current closures, and may possibly be used for future packaging. Prototyping and testing will occur throughout 2022, with plans to use it commercially in 2023.

Director of Packaging Development at The Absolut Company Eric Näf said: "We know that collaboration across the whole value chain sits at the heart of long-term progress and true environmental, economic and social impact. As part of our circular way of thinking, we are delighted to be working with BOC to continue designing out single-use materials and using packaging innovation for the benefit of the planet."

Lars Sandberg, CEO of Blue Ocean Closures, said: "We are proud to partner with Absolut Vodka to bring an alternative cap solution to the market. My first job was actually on the Absolut Vodka factory floor, so I've seen how quality is a key focus across every part of the production process."

Ulrika Evermark, Community Manager at Blue Ocean Closures, said: "We are excited to welcome Absolut Vodka to join us in the important development of our caps, alongside industry leaders such as ALPLA and Glatfelter."

Food FOR thought

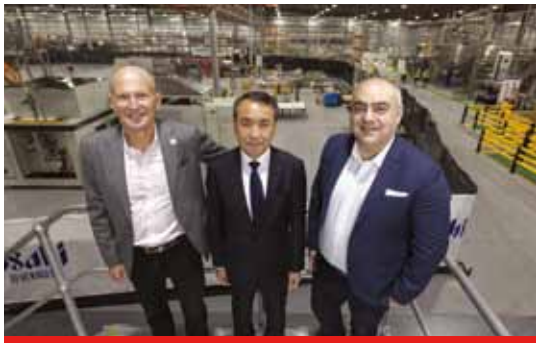
Kellogg Company to split into three businesses

Kellogg Company has announced that it will be spinning off its North American cereal and plant-based food businesses and thus creating three wholly independent companies for its brands worldwide. The companies are temporarily being called Global Snacking Co., Plant Co., and North America Cereal Co.

Global Snacking Co. will essentially contain all of Kellogg's business outside of North America alongside Kellogg's current frozen food business. Kellogg Company's three international regions (Europe; Latin America; and Asia Pacific, Middle East, and Africa) will primarily exist within this company. Global Snacking Co. will represent the clear majority of the Kellogg Company's portfolio, with the constituent brands accounting for 80% of worldwide sales in 2021.

Plant Co. will be concentrating on plant-based foods with hopes to expand sales outside of its current North American market, though the business may be sold.

Finally, North America Cereal Co. is, as implied by the name, the company's current North American cereal business. Kellogg Company says this company will likely spin off before Plant Co.



Asahi opens upgraded Qld factory

Asahi Beverages has opened its newly upgraded facility in Wulkuraka, Ipswich, South-East Queensland, following a $55 million makeover to boost its production capacity

The plant will now produce 300 million litres of non-alcoholic beverages a year. Brands currently produced on the site are Schweppes, Solo and Pepsi Max; the upgrade will add others such as Cool Ridge water, Lipton Iced Tea and Pop Tops juice to its repertoire.

Two new bottling lines were added to the factory, along with a 39 m-tall warehouse to facilitate drinks being shipped around Australia. The plant will be operating 24/7 – and was opened by Atsushi Katsuki, Global President and CEO of Asahi Group Holdings, Roland van Bommel, Chairman of Asahi Holdings Australia, and Robert Iervasi, Asahi Beverages Group CEO.

"Our $55 million investment has created a world-class Queensland manufacturing site," said Iervasi. "It has also nearly doubled the site's annual production capacity to 300 million litres.

"Perhaps the upgrade's most exciting part is the new hot-fill and blow-fill line, which will make Lipton Iced Tea and Pop Tops. The line's innovative design means these drinks will be made without preservatives and using bottles inflated on-site from small pieces of preformed plastic. These are more sustainable than pre-inflated bottles because many more can be delivered to site per truckload — significantly reducing truck trips and carbon emissions.

"This will help Asahi Beverages reach its sustainability goal of reducing Scope 3 carbon emissions across its entire supply chain by 30% by 2030. Asahi Beverages will also reduce carbon emissions in its operations by 50% by 2025."

Chobani unveils Dandenong South facility

Chobani has opened its new facility in Dandenong South in Melbourne, thus bringing together its operations into one consolidated location. Developed in cooperation with Aliro, the facility features new offices, a research and development pilot plant, and an additional warehouse.

The inauguration of the facility was celebrated with a visit by Chobani's founder and CEO Hamdi Ulukaya.

"We have long-term ambitions to grow our business, not only through growth in the yoghurt category but also expansion beyond dairy, and this new facility will set us up to achieve these growth plans," said Chobani Australia's Managing Director, Lyn Radford.

"Dandenong South has been our home since day one, so we are really excited that we will continue to be a part of this thriving local manufacturing hub and give back to the local community in which we operate."

Chobani celebrated its 10th year of operation in 2021. It entered the Australian market in 2011 and announced the expansion to its Dandenong South location last year as it sought continued growth.

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Taking stock

Reimagining the production line

Sam Schachna, CEO of Roma Foods, shares lessons learned and how he's rethinking the world of work with SafetyCulture. Here's a look back — and a lens on what's next.

COVID has sparked a renaissance in the local food manufacturing sector, and companies like my own are fortunate to be riding this wave. Operating for nearly seven decades and exporting to over 70 countries worldwide, Roma Foods is an Australian, family-owned manufacturer on a mission to create great food for healthier living. Despite the upheaval caused by COVID-19, the pandemic has in fact accelerated opportunities for Australian food manufacturers. As consumers increasingly demand locally made, allergen-friendly and plant-based foods, we've had to take our operations to another level.

The future is very bright for local companies — especially if you are able to double down with the right tech, teams and operational approach.

Reshaping the manufacturing industry post-pandemic

The Australian food manufacturing sector was well prepared leading into the pandemic due to the Good Manufacturing Practices that are embedded within the industry. Nevertheless, COVID has highlighted several priorities and accelerated several trends in the food manufacturing sector. Something that insulated Roma Foods against major COVID disruption was our existing focus on local, robust supply chains. The industry will face continued supply chain disruption from both COVID and global influences. It is therefore critical to purchase locally wherever possible and build strong relationships to enhance the overall resilience of the sector.

Roma Foods is proud of its strong relationships with local suppliers based on years of collaboration. As an industry, we need to invest in the depth and capability of local supply chains — from farm to plate — to ensure that we are always in a position to provide food security to all in our community.

Investing in smart operations

In a similar vein, there is a need to invest in local capability and infrastructure to improve efficiency and innovation. It is not an even playing field for local manufacturers, as Australia does not have the scale or local market size to compare to global multinationals. To thrive in the local industry, it is critical to compete where local is a competitive advantage and to invest in skills and infrastructure to improve efficiency and innovation.

With ever-changing government regulations and market dynamics, COVID led to us adopting a new mindset of 'measured urgency', proving that we can do better, more quickly and effectively. To achieve this, Roma defined a new business strategy to meet the needs of the ever-growing health shopper, launching over 40 new products into the health and mainstream aisles and adopting new technology improvements such as digitising workflows to empower our journey of growth and innovation while ensuring we prioritise safe people, safe product and safe data. We've invested in tech solutions like iAuditor by SafetyCulture that can help staff perform checks, report issues and collect on-the-ground data in minutes. It hasn't just unlocked the ability for us to achieve the step-change growth that we're driving for, but has also allowed us to do it in a manner that is safe, agile and ambitious, always looking for avenues for growth.

Always have one eye on growth

Being alive to opportunity and taking calculated risks is key to survival. This is especially so in a time where there is so much uncertainty. Through COVID we scaled up to respond to increased demand in the short term and kept one eye on growth, launching new brands into new markets. Our community relies on us and it's something we take very seriously.

A key tenet of an expansion mindset is investing in human and capital infrastructure. Our vision is to have a Roma Foods product in every family's pantry. By investing in our people, brands and capability, we are getting closer to achieving our vision every day.

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Fibre analysis

The Gerhardt FIBRETHERM fibre analysis automates the time-consuming and labour-intensive digestion and filtration processes for determining the various fibre fractions in grains, cereals and feedstuffs. It fully complies with the standard methods specified by Weender and van Soest.

The system enables the simultaneous processing of up to 12 samples, which can reduce energy and chemical consumption, and the laboratory time taken compared to the standard manual method. The analysis system automatically controls and monitors all of the boiling, washing and filtration processes within a single self-contained system and users have no direct contact with any chemicals to ensure maximum safety and productivity in the lab.

The method is based on the FibreBag technology developed by C. Gerhardt. This filtration technology can avoid the common problems associated with the classic filtration method using frits and filter beds, and it simplifies the handling and digestion of samples to help ensure fast, consistent and precise results.

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Long-cut pasta packaging system

GEA has re-engineered the H-Packer SO Plus for long-cut pasta packaging by integrating a faster technologically advanced system, comprising a double dosing unit and a continuous motion packaging machine. The system is designed to enable pasta manufacturers to increase product flow, minimise product loss, simplify line control, and ensure smooth filling in the packaging process.

The modified version is equipped with a second weighing hopper and artificial intelligence. A new electronic architecture based on the Siemens PLC provides centralised system control and a customisable operator interface.

The LC-Doser DDW dosing unit of the system has been redesigned to optimise product flow to the horizontal packaging machines for flat and rough shapes and to reduce product breakages.

The system features LED lighting for quick visibility of possible malfunctions in the process and a protective device equipped with coded sensors to achieve a high safety standard. Moreover, thanks to a motorised reel holder, the machine can work not only with conventional plastic films but also with paper films.

The machine is completed by a renewed patented stripper-gripper system.

GEA Australia
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Allergen-free legume flours

Müller's Mühle Business Solution has released its SMART Pulses Pro range of legume flours. The natural flour concentrates obtained by air separation are allergen-free, clean label and high in protein, making them suitable for the production of texturates for plant-based meat alternatives.

The key feature of the flour is the high protein content, which is increased to up to 65% through the air separation process.

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Health bar maker enhances food safety and line efficiencies

Based in Canada, Luxme International has supplied a SANILux Tubular Chain Conveyor with automated clean-in-place technology to nutrition bar manufacturer TruFood, enhancing food safety and increasing line efficiency.

In 2019, increased customer demand prompted the US-based manufacturer to embark on an expansion project to boost its manufacturing capabilities. High on the list for improvement was the company's ingredient delivery system — a multi-step manual process that required significant time and labour to prepare and transfer fine and coarse ingredient powders and inclusions such as chocolate chunks, soy crisps and cookie pieces to the mixer. It not only required an automated ingredient transfer solution that would increase yield and improve line efficiency, but it also needed to ensure food safety by reducing the risk of allergen cross-contamination between changeovers for different product ranges.

Following discussions with several equipment manufacturers, TruFood decided on the SANILux Tubular Chain Conveyor from Luxme. "As well as efficiently transferring screened and weighed powders and inclusions to the mixer, the ability of the SANILux to reduce the time required for a sanitary changeover and remove all allergens from the conveying system were ultimately behind our decision to partner with Luxme," said Mike Berko, Project Engineer, TruFood. "Their willingness to work within our constrained space requirements also impressed us."

Avoiding allergen cross-contamination

As a producer of nutrition bars with a wide range of certifications and claims — including kosher, non-GMO, organic, halal, gluten-free, fair trade and sugar-free — TruFood takes its commitment to avoiding allergen cross-contamination seriously.

The manufacturer faced a variety of challenges when seeking to upgrade its operation. "We work with mid-sized emerging brands as well as established consumer packaged goods (CPG) companies commercialising new product platforms," Berko explained. "With this comes additional complexity, requiring sophisticated systems to protect and propel their brands. To better support these partners, we not only required more flexible and consistent operations, but also easier, more efficient changeovers and sanitation protocols. Sanitary design and ease of cleaning are forefront in our minds when evaluating any new solution."

To meet these requirements, Luxme specified its SANILux Tubular Chain Conveyor technology. An enclosed, self-cleaning system, it is designed to protect ingredients from atmospheric, airborne contaminants and other bacterial elements. The automated CIP technology is designed to ensure the conveyor is fully sanitised in just 60 minutes, and is validated with allergen swab testing.

"The SANILux can go from dry to dry, fully allergen sanitised, in just one hour — about 10% of the time it took us previously when the process was manual," Berko said. "As well as improving food safety, this has translated into an uplift in our production capacity as changeover of the delivery system is achieved in a fraction of the time required on our other production lines, minimising downtime. By removing a manual process, it has also resulted in labour savings."

The conveyor itself comprises a fixed drive and tension assembly, which automatically tensions the chain continuously during the process and regulates it according to friction, product flow and variation in atmospheric/product temperature.

Capable of 300, 500 or 1100 ft^3/h capacities, the system is suited for the automatic conveying of all types of food, at any stage of receiving, processing and packaging.

The system has been running successfully at TruFood's manufacturing facility since it was installed in May 2020.

In addition to fulfilling the sanitary requirements, it has also delivered improvements such as gentler product handling, reduced ingredient fines, automated and repeatable process and waste minimisation with the sealed conveying solution.

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7 solutions to dairy CIP challenges

Emerson Automation Solutions

The dairy processing industry faces many challenges. The toughest and overwhelming majority of them involve minimising product and utility waste while adhering to the highest process and product quality standards. Efficiency is especially pertinent during the clean-in-place (CIP) process, as dairies are required to thoroughly clean and sterilise equipment throughout production. Without proper measurement, the CIP process can become a significant cost source.

Although dairy plants manufacture a variety of dairy-based goods, they all traditionally share the initial processing steps in common.

First, milk is delivered from tankers to cooling tanks at the plant. It is separated and standardised into major product categories (skim milk, whole milk, and cream) then pasteurised to significantly reduce spoiling microorganisms and destroy pathogenic bacteria. Finally, the milk is homogenised to reduce fat globules and reduce/prevent creaming.

At each stage, the plant and its process equipment must maintain scrupulous cleanliness, which requires cleaning-in-place. While CIP is vital to the hygienic practices of dairy plants, it can also be a source of inefficiencies. Accurate and reliable measurement of flow, level, pressure, temperature, and conductivity to reduce waste by using hygienic instrumentation that meets sanitary design standards and practices is of utmost importance.

CIP programs

CIP programs differ from application to application but traditionally they consist of three basic steps:

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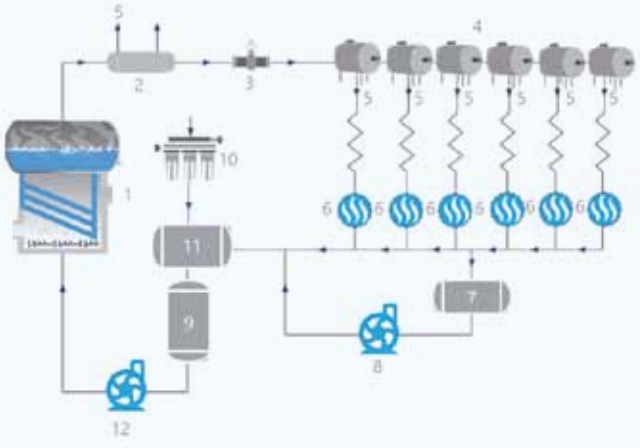

Figure

Flushing: Dairies typically start their CIP process by running warm water through the pipes for a predetermined amount of time.

Chemicals: An alkaline detergent and/or acids are circulated at a temperature between 60–75°C.

Heat: Hot water is circulated to disinfect the piping and rinse out any remaining chemicals.

These steps present measurement challenges that can induce energy loss and create waste, which ultimately leads to a higher cost of operation.

Challenges with CIP

Since all dairies run a CIP program, they also face the same challenges. In the following section, the seven common CIP efficiency challenges are presented along with seven solutions in the form of proper measurement instrumentation.

1. Steam trap failure can add costs of extra steam to keep plant running

During the CIP program, condensed steam (i.e., condensate) is collected in steam traps and a condensate tank before being pumped back to the boiler. If the steam trap is failing, steam can be lost and require more energy to keep the plant running. Effectively monitoring the health of the steam traps ensures energy is not being wasted, thus decreasing energy costs as well as maintenance hours. See Figure above:

Solution

A wireless acoustic transmitter allows visibility into steam traps and pressure relief valves by accurately communicating acoustic level and temperature data. This allows for constant monitoring of steam trap parameters, health. Steam trap monitoring software provides real-time, continuous information about steam trap conditions, energy usage, and emissions.

2. Utility steam heating can add cost when not managed properly

Dairy processing uses more energy than any other sector of food processing. Large energy usage translates to high costs if not properly managed. The CIP process, especially, accounts for a major portion of this energy use. In dairy plants, steam is used extensively for sanitation and cleaning during the CIP program. Inaccurately measuring steam while using it to clean equipment can be costly for plant operators. Therefore, selecting high-quality instrumentation allows a plant to reduce steam usage with accurate measurement.

Solution

Multivariable differential pressure (DP) transmitters can accurately measure the flow of steam, ensuring it is used efficiently and effectively. Ultimately, this leads to a great energy cost reduction.

3. Leftover product within pipes becomes waste during the CIP process

During the CIP process, any product left over in the circuit will be unusable as soon as it encounters the caustic chemicals used for cleaning. Pigging, a common practice used to clean pipes, often cannot be performed as intrusive measurement sensors, which penetrate a pipe, would be damaged by the pig. Using non-intrusive process temperature measurements allows operators to use pigging-like processes to harvest additional product before the CIP program begins, resulting in less product waste.

Solution

A surface temperature sensor allows for accurate process temperature data without the need for thermowells or process penetrations that would impede the use of pigging. Using an advanced surface temperature sensor that uses a thermal conductivity algorithm measures the ambient and pipe surface temperatures and calculates an accurate and repeatable process measurement.

4. Chemical tanks hold costly chemicals to clean plant

As mentioned in the CIP overview, large tanks are used to hold chemicals used in the CIP process. Making sure these chemicals are used efficiently is vital to reducing costs and ultimately saving money. Optimising chemical usage and storage by using accurate level measurement and reliable high level alarms ensures no chemicals are wasted during the CIP process.

Solution

A hygienic pressure transmitter with high accuracy at low pressure ranges allows for repeatable and accurate readings. This ensures reliable hydrostatic level measurements at all times. A hygienic fork switch allows for accurate level readings. Adjustable switching delay prevents false switching in turbulent applications.

5. CIP processes running too long increase material and energy costs

Some of the most critical CIP measurements are return temperature and conductivity. Accurate temperature measurements with drift alert and hot backup ensures temperature stays online and limits the need for additional CIP runs. Conductivity is important to detect what fluids returning to the CIP skid may be water, milk, chemicals etc., as they all have a different conductivity. So when the conductivity changes, it is assured the milk/water/chemicals were flushed out and the next process can start without additional processing of CIP.

Solution

A hygienic four-electrode conductivity sensor is intended for measuring conductivity in the pharmaceutical and food & beverage industries can be used to accurately measure conductivity. The broad dynamic range of the sensor (1–1,400,000 uS/cm) makes it suitable for CIP applications. It also allows for quick responses to the needed temperature changes.

A surface temperature sensor allows for accurate process temperature data without the need for pipe penetration. In addition, non-intrusive temperature measurements can help monitor temperatures in hard to measure places, ensuring that CIP processes are not running longer than necessary. This, in turn, limits waste of chemicals and utility heat.

6. Plants are unable to differentiate between milk and water during CIP cycle

During the CIP program, it is important to be able to detect different phases in the process. This allows the plant to differentiate between milk, water and caustic chemicals. When a plant has access to this information, they can fully utilise the product and minimise waste. Knowing the process phase also allows for quicker changeover from CIP back to product production.

Solution

Utilising density measurement phase detection, such as a Coriolis meter, allows dairies to identify different densities of the product, effectively making plant operators able to detect the difference between the product, water rinse and caustic cleaning solution.

7. CIP process requires a certain turbulence to maintain cleanliness

The CIP process requires that the liquid moving through the pipes maintains a certain velocity for optimal cleanliness. Liquid moving too slowly can leave behind undesirable chemicals and spoiled product. Utilising accurate velocity measurement allows for plants to maintain the highest degree of sanitation.

Solution

A hygienic Coriolis transmitter can be used to provide accurate measurement of velocity. It can calculate derived variables such as volume flow rate, flow totals and concentration measurement, which can then be translated into an output signal useful for process control.

Summary

Reducing waste and increasing efficiency are key to running a successful dairy processing plant. With these seven instrumentation solutions to common CIP challenges, dairy plants can save time and money while increasing productivity.

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Food-approved cleaning and oil products with detectable removable equipment

The presence of foreign bodies in food is the primary cause of consumer complaints that can lead to the recall of all products. As blue food is rare in nature, any foreign body that could contaminate food is colour coded blue as standard for detection.

iBiotec-manufactured NSF products allow this detection. All removable bodies, capsules, caps, covers, diffusers, nozzles, extenders with risk, are blue and detectable — Detect Blue equipment. This means that all components that can be separated from their packaging, and which can present a danger in the event of an accidental migration into food, are easily detected by visual control or detectable by industrial vision.

iBiotec products that are approved under the various NSF categories include: H1 lubricants: usable in food manufacturing areas and used as anti-corrosion agents, non-stick seals on tank closures, lubricants for materials located in areas of potential contact with food; K1 solvents: usable outside the food manufacturing areas (the vapours must not enter the manufacturing area) to degrease materials (eg, conveyor rollers, other mechanical maintenance, etc) used in manufacturing areas; and A1 cleaners: usable in food manufacturing areas and usable as general cleaning detergent on all surfaces with a rinse with drinking water necessary after use.

The iBiotec Production site is a Certified Production Facility in Saint-Rémy de Provence, France: ISO 9001, OHSAS 18001, ISO 14001, SMI Customer Service and Satisfaction, Certifications underway: ISO 14040 Lifecycle analysis, and ISO 26000 Social Responsibility.

iBiotec NSF approved products are available through Orana Technologies in the following categories: cleaning degreasing solvents; cleaning detergents; lubrication and maintenance oils; penetrating fluids; release agents; and technical greases.

Orana Technologies

www.oranatech.com.au

Hygienic stainless steel enclosures

All areas of the food industry require different hygiene standards. Particularly in open processes, where the resistance of the seal to detergents and disinfectants is crucial, it is vital for production plant to be equipped with optimised enclosures, terminal boxes and command panels.

APS Industrial is offering Rittal's range of hygienic design enclosures which are suited to food and beverage manufacturing environments — from the housing and the power distribution to the climate control and the IT infrastructure.

Crafted from stainless steel, they feature a smooth surface grain, internal hinges, washable gaskets and latches, and no crevices to trap debris or contaminates. In addition, compatible accessories such as wall spacer brackets and cable glands are available as part of the range.

The enclosures are available with screw covers for smaller, integrated applications or hinged doors for larger installations. Both are created from 304 stainless steel with a 400-grain brushed surface. Wall and door surfaces are angled to prevent objects from adhering so water runs off easily.

The products can be mounted with rounded stand-off brackets on the back to improve the flow of water around the unit during washdown procedures. Further, using optional hardware, larger enclosures can be mounted on levelling feet and fitted with a wire shelf to assist with cable routing.

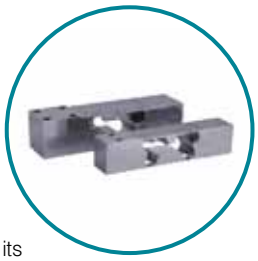
All mounting threads are concealed to keep them free of debris and contaminants. Optional stainless-steel cable glands have smooth, solid exterior surfaces and are self-sealing to enable high-pressure washing.

Continuous silicone seal door gaskets can be replaced as necessary without the need for special tools. The blue gaskets align with a specifically engineered fitted channel for a tight seal without any adhesive. The distinctive colour makes any particulate splashed on the seal stand out for easier recognition and removal.

APS Industrial

www.apsindustrial.com.au

Hermetically welded load cell



The Lorenz AX series single point load cell is made from stainless steel with hermetically welded design with IP69K certified protection. The load cell is designed to provide a high degree of protection against external factors, making it suitable for food industry applications such as measurement in high-pressure cleaning.

The compact industrial load cell can be easily fitted in a weighing platform with dimensions up to 600 x 600 mm. Due to its good protection class, it can allow for accurate force measurement in a challenging environment such as a high humidity and highly corrosive environment. It can also allow for load compensation when the force is not equally distributed at the centre of the load cell.

The load cell offers flexibility for a wide range of measurement applications with multiple nominal measurement ranges starting from 0–10 up to 0–500 kg. Despite its large measuring ranges, it provides stable measurement over the entire measuring range with the combined error of less than 0.01%. It has been rated with class C3 as per OIML R60 international accuracy standard.

The patented design of the load cell combines high accuracy measurement with good protection. Additionally, it can also be optionally designed as an intrinsically safe version and tested for IeCEx certification for measurement in a potentially explosive atmosphere.

Bestech Australia Pty Ltd

www.bestech.com.au

Mobile flow cytometer

CytoQuant is a handheld, mobile impedance flow cytometer. Using a simple swab test, users can detect and measure all bacteria and residues on food processing surfaces in 30 s.

Food safety depends largely on the cleaning and disinfection practices of food manufacturing facilities. The absence of bacteria (like ***Salmonella*** and ***Listeria***) in food processing environments is essential for preventing illness and increasing shelf life and quality of food products. Current test methods, like ATP swabs, are a useful indicator of cleaning efficacy but do not tell the user if surfaces are properly disinfected. Traditional plate count methods also have limitations in that they take days to return a result and only 1% of all bacteria is culturable. CytoQuant enables the detection of all bacteria with an intact cell wall, and the results are available on-site instantly.

Bacterial cells have a non-conductive cell membrane and a conductive cytoplasm. It's these unique electrical properties which act as a fingerprint allowing the device to distinguish between bacteria and all other particles in a sample. The device is designed to give separate, precise results for bacteria (intact cells/mL) and residues (particles/mL).

Simple to use, the test can be performed by anyone and requires no special training. Measurements are not influenced by disinfectants or temperature and there is no need for pre-treatment, incubation or chemical reagents.

It can be used as a tool by QC managers to make fast and informed decisions during food production and improve the efficiency of their cleaning procedures.

The product has been developed and manufactured by Romer Labs and is available in Australia exclusively through Vendart Diagnostics.

Vendart Diagnostics Pty Ltd

www.vendart.com.au

Salmonella and chocolate

Just prior to Easter, there was a recall in the UK and Ireland of chocolate products manufactured in Belgium. The recall was due to potential microbial (salmonella) contamination and was later extended to a global recall, which included the products being recalled from sale in Australia and New Zealand.

The European Food Safety Authority (EFSA) and the European Centre for Disease Prevention and Control (ECDC) are now investigating the transnational outbreak of salmonellosis linked to chocolate products, to identify the root cause, time and possible factors behind the contamination, including the evaluation of possible wider use of contaminated raw materials in other processing plants.

While awaiting the results, the German Federal Institute for Risk Assessment (BfR) has compiled the following information on the topic of salmonella in chocolate.

After Campylobacter germs, salmonella is the most common bacterial causative agent of intestinal diseases in Germany. High-risk foods are, in particular, undercooked or raw meat and products made from it, eggs and egg-products that have not been heat-treated, and plant-based foods. However, fatty foods such as chocolate can also be contaminated with salmonella.

In the case of chocolate, even small amounts of germs can be enough to cause a disease. The low infection doses are attributed to the fact that the salmonella in the high-fat chocolate is protected against the acidic conditions in the human stomach and, for the most part, reach the intestines alive, where it can cause an infection.

The disease, known as salmonellosis, is often accompanied by diarrhoea and abdominal pain, but fever, nausea and vomiting are also possible. Children in their first years of life and people whose immune system is weakened, for example due to old age or previous illnesses, are particularly at risk.

Salmonella is very rarely detected in chocolate. As part of reporting on zoonotic pathogens in the food chain, the authorities of the federal states in Germany reported tests for the occurrence of salmonella in around 2500 samples of chocolate-containing products to the BfR between 2012 and 2019. Salmonella was not detectable in any of the reported samples from these years. Since 2020, the Federal Office of Consumer Protection and Food Safety (BVL) has been responsible for data collection and reporting on this topic.

Nevertheless, outbreaks of disease caused by salmonella in chocolate products are known primarily through scientific publications. The last outbreak of salmonellosis in Germany known to the BfR in connection with chocolate occurred in 2001 and was caused by the salmonella type Salmonella Oranienburg.

Salmonella can survive in chocolate for up to several years. It is also very well protected against heat due to the low water content of chocolate and the protective effect of the fat.

There are almost 2700 different salmonella serotypes (serovars). A prevalence for certain serovars to be more common in chocolate than others — such as with eggs, which are mostly contaminated with *Salmonella (S.) enteritidis* — is not evident in chocolate products. For example, in known salmonellosis outbreaks caused by the consumption of contaminated chocolate products, the serovars S. Napoli, S. Oranienburg or S. Typhimurium were found. S. Durham has been found in cocoa powder, S. Eastborne in cocoa beans and S. Nima in chocolate coins.

In the National Reference Laboratory for salmonella at the BfR, the serovars S. Hull or S. Salford (isolate from chocolate), S. Nigeria (isolate from cocoa shells), S. Typhimurium (isolate from chocolates) and S. Senftenberg and S. Weltevreden (isolates from cocoa) were identified during the last four years.

The recent outbreak in Belgium was reportedly suspected to be caused by monophasic Salmonella Typhimurium from the buttermilk tank at the Belgium processing plant.

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4 food tech trends to watch

Over three decades of research into food technology, **Professor Benu Adhikari** has seen powerful changes in our approach to food and nutrition. Leading a team in RMIT's Food Research and Innovation Centre, he brings researchers and businesses together to develop innovative new products for the global marketplace. Here Adhikari shares the four key technological trends he sees shaping the future of food.

Plant proteins: a booming industry

With consumers now more knowledgeable about where their food comes from and its impact on the environment, it's no surprise the global plant-based food industry is growing exponentially.

According to a report by Bloomberg Intelligence, the industry is predicted to leap from US$24.9 billion in 2020 to US$162 billion by 2030.

One of the booming trends is plant proteins. Industries that have traditionally sold animal protein-based products are now branching out with plant-based offerings like mock and alternative meats and vegan protein shakes to target a new market.

The plant-based food industry is predicted to be worth US$162 billion by 2030.

"Plants are made up of different compounds that are nutritionally important like protein, carbohydrates, vitamins, minerals and phytochemicals such as polyphenols," Adhikari explained.

"Some plants contain a large amount of protein. This can be extracted and used to create nutritional and delicious products that replace animal proteins."

While soy, pea and lentil proteins are used widely in existing plant-based foods, Adhikari's team are researching proteins from plants such as hemp and potato to bring greater diversity to plant-based diets.

Plant proteins also have economic and environmental benefits. A study published in *Nature Food* found meat accounts for almost 60% of greenhouse gases created from food production.

"Production of animal protein costs a lot per kilo," Adhikari said. "Plant proteins cost much less to grow and harvest; they are nutritious and have less environmental impact than livestock."

Some plant proteins like flaxseed and canola proteins are by-products of oil extraction. While historically these proteins were sold off as animal feed for their high nutritional value, scientists have found ways to repurpose them to improve the texture of many plant-based foods.

Next big thing: algal proteins

As the food industry focuses on more sustainable practices, Adhikari said companies are looking at algae as a potential source of protein.

"Plant protein is already here but algal protein will be the next big thing," he said.

In many ways, plant and algal proteins are nutritionally similar, but algae take less land to grow.

"Algae growing in a bioreactor can create the same amount of protein as plants, saving hectares of land," Adhikari said.

Algae requires less land to grow and creates the same amount of protein as land plants.

Like plant proteins, algal protein is a by-product of algae oil extraction. Adhikari and his research team at RMIT are working with companies to investigate how they can best use algal protein in food.

Adhikari said these proteins have great potential to create diverse food offerings, especially for people with restricted diets. This could include substitutes for animal-based ingredients to improve texture of plant-based foods, as well as fortify health supplements like squalene.

Polyphenols: giving healthy foods a boost

Drinkers of green tea already reap the benefits of polyphenols, which are antioxidant-rich compounds occuring naturally in plants.

Polyphenols are added to health or medicinal foods like supplements for added health benefits beyond basic nutrition.

For example, when a person does not get enough rest, their cells create more reactive oxygen, which contributes to aging. Polyphenols take out this reactive oxygen and help slow down the aging process.

"Polyphenols are produced by plants to protect themselves from insects, cuts and wounds. If we use polyphenols in a calculated amount, they have a protective effect especially against reactive oxygen," Adhikari said.

While the use of polyphenols to fortify health food is not new, the research into the compounds is still in its fundamental stages.

"Researchers are now exploring different types of polyphenols, looking at their function and where we can take them," Adhikari said.

His team is currently studying the properties of the roselle plant (also known as hibiscus), which could contribute to how we treat diabetes and manage obesity.

Properties in hibiscus tea could help treat diabetes and manage obesity.

"We know there are polyphenols in the roselle. We are looking into how they behave and how good they are compared to known polyphenols.

"We think that some of the polyphenols from the roselle could help reduce diabetes by not letting the adipose cells, which are fat cells, multiply too much."

4D-printed foods: a future frontier

You may have heard of 3D-printed foods, but Adhikari says 4D-printed food is the next iteration.

> *As the food industry focuses on more sustainable practices, Adhikari said companies are looking at algae as a potential source of protein.*

4D-printing is the process where a 3D-printed object transforms its structure over time, usually triggered by an environmental factor like humidity, heat or microwave energy.

From donuts morphing into new shapes to biscuits changing colour over time, the excitement over 4D-printed food currently rests with its novelty factor, but there is potential for this technology to help people with dysphagia, who have trouble swallowing foods.

"There are lots of parameters to factor in — size, shape, texture, nutritional density and the combination of ingredients — that not only makes swallowing and digestion easier, but also avoids choking hazards," he said.

Shape-changing donuts are just the tip of what's possible with 4D-printed food.

So does Adhikari see a future of 4D-printed, self-hydrating pizzas like in *Back to the Future 2*? Maybe.

"It will depend on the technological advances in hardware, software and materials to come. And it will all depend on the market — if there's demand, experts in food technology will try to get us there."

Benu Adhikari is Professor of Biosciences and Food Technology at RMIT, with a focus on food engineering, proteins, structure and function.

RMIT University
www.rmit.edu.au

Semi-automatic batching station

The Sterling Systems & Controls Semi-Automatic Hand Prompt Batching Station is designed to eliminate bad batches typically associated with manual batching, and assist in meeting product safety goals with lot tracking and batch validation capabilities.

Suitable for a range of industrial applications, the batching station uses operator involvement through each step in the batching process, and provides automated operator instructions or prompting, ingredient lot tracking, automatic weighing with over/under tolerance control, compliance with recipe/formula, etc. Eliminating bad batches resulting from operator error and interruption is a primary benefit.

The unit's PC will prompt the operator to add ingredients to the batch for weighing, and will sequence an operator through the chosen recipe/formula one ingredient at time. It is designed to ensure that each ingredient added to the container is within programmed weight tolerance, and that the ingredient lot is correctly logged before the batching station will index to the next required ingredient.

As batches are produced, the batching station records the ingredient and batch data, and can locally print batch reports.

If an alarm condition occurs during the batch creation, the system can print an alarm message. Batching reports can be printed automatically at the end of a batch, or can be recalled and printed on demand through either the unit's software or WebCentral (optional supervisory control software application).

A barcode scanner can be provided and attached to the batching station using a NEMA 4X quick disconnect bulkhead connector mounted on the control panel. A wireless version of the barcode scanner is also available.

Sterling Systems and Controls Inc
www.sterlingcontrols.com

Mixer

N&N Nadratowski has released its largest Tiltable Z Arm Mixer — the MIX-2600ZV. The mixer has a bowl capacity of 2600 L and is constructed with a reinforced bowl that can be used under vacuum. The bowl and surface of the intermeshing shafts are highly polished to reduce product adhering to them during processing.

The Z series is equipped with a colour, user-friendly HMI touchscreen with software allowing access control and manual as well as automatic operation for up to 100 programs with five steps in each.

Using vacuum in the process is designed to improve protein extraction, absorption of both liquids and spices, and removal of air in the product.

The mixers are suitable for heavy, thick products such as kebab meat, bakery and confectionery.

N&N Nadratowski has a range of various types and models of mixers for all the facets of the food processing industry. The mixers can be specified with or without vacuum, single or twin shaft, including CO_2 and N_2 cooling or heated jackets for cooking. The Nadratowski program includes vacuum tumblers and frozen block breakers.

Global Machinery & Supplies Australasia Pty Ltd
www.globalms.com.au

Flow meter

The McMenon averaging Pitot tube is a multiport self-averaging flow meter with a design based on the classical pitot tube concept of fluid flow measurement. The product produces an averaged differential pressure (DP) signal proportional to the square of the flow rate. The DP output is normally piped to a differential pressure transmitter in order to generate an electrical signal proportional to the flow rate.

The outer impact tube has a number of pressure sensing holes facing upstream which are positioned at equal annular points in accordance with a log-linear distribution. This pressure is represented at the head as the high pressure component of the DP output. The low pressure component is generated from a single sensing hole located on the downstream side of the outer impact tube, measuring static pressure. The product's profiled flats are positioned around the downstream hole and define the separation point at which the flow lines separate as the fluid passes around the outer impact tube. This creates a stable pressure area at the downstream pressure sensing hole thereby maintaining a more constant flow coefficient at high velocities enabling a wide range of flow measurement (turndown).

AMS Instrumentation & Calibration Pty Ltd
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Food science eBook

The 'Efficiency and sustainability for Food industry' eBook has a focus on innovation and shows how robust measurement solutions can help the food industry increase profitability and eliminate waste in processes.

Circular food economy is possible with a bite of science. Measurements of such critical parameters as carbon dioxide, relative humidity, temperature and Brix enable food and drinks producers to streamline their operations, produce more yet in a sustainable way and at a lower cost. And food waste can be turned into value by producing biogas and biomethane.

Learn the details from the Food Science eBook, which is available for download here.

Vaisala Pty Ltd
www.vaisala.com

Dairy spectrometer

The PerkinElmer LactoScope 300 FT-IR analyser enables users to quickly and easily analyse important nutritional information about liquid dairy products as well as to search for any abnormalities within them.

The product is able to detect important factors in dairy products such as fat, protein and lactose levels, enabling producers to keep track of the nutritional profiles of milk, cream and whey.

It is also capable of detecting adulterants such as urea, ammonium sulfate, maltodextrine, sucrose and water in raw and processed milks.

The system has a touch-screen and simplified software interfaces to enable ease of use. Liquids samples can be quickly placed into the instrument and analysed with the push of a button. The results will be displayed on the product's 12-inch display within 45 seconds; the number of analyses done per hour is therefore around 60.

The system is cloud-based, enabling remote access and reporting, and giving users the ability to access the results when not physically at the site of analysis.

PerkinElmer Pty Ltd
www.perkinelmer.com

Fingerprint technique for virgin olive oil

Food fraud in the olive oil industry is becoming increasingly common, especially when it comes to the origin and varieties of a product. Now, a team in Spain has presented a new authentication tool to check the geographical origin of virgin olive oil as a control on the quality, tradition and product linked to the territory.

The team, from the Faculty of Pharmacy and Food Sciences, Torribera Food and Nutrition Campus and the Institute for Nutrition and Food Safety Research (INSA) of the University of Barcelona, developed the new tool to provide an official authentication method that could be applied at different geographical scales.

The methodology, which has been published in the journals *Food Chemistry* and *Food Control*, enables the discrimination between virgin olive oils produced in the European Union and those that are not. The geographical authentication strategy is based on the analysis of sesquiterpene hydrocarbons — organic compounds formed by three isoprene units — which proved to be good origin markers for olive oil.

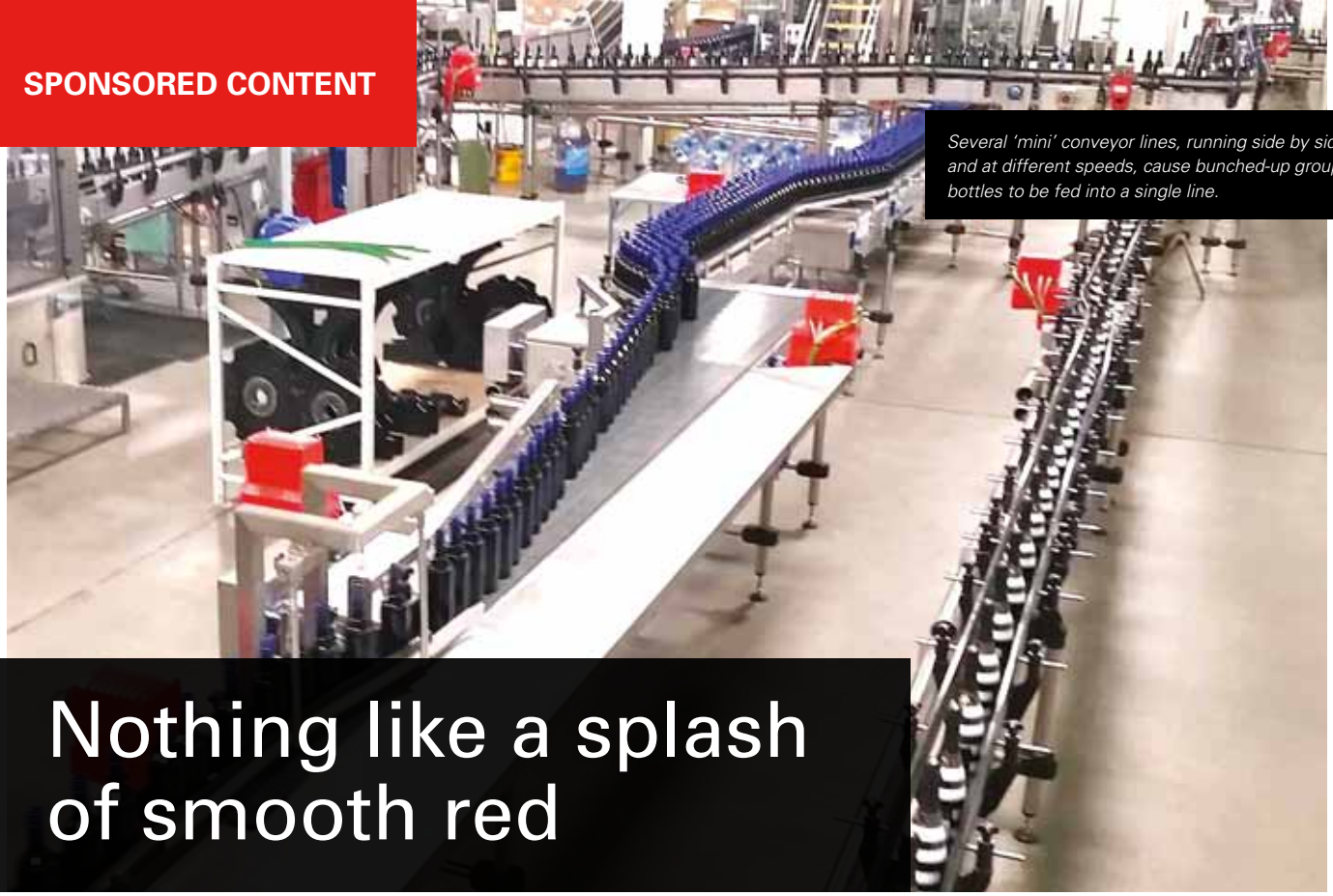
"The cornerstone of an efficient authenticity tool is for it to be based on robust analytical markers. In the case of the geographical authentication of the virgin olive oil, the markers depend largely on the variety of olive tree and the area where it grew, without being significantly influenced by other factors related to the process of extracting or preserving," notes researcher Beatriz Quintanilla-Casas (UB-INSA), first author of the studies.

"The sesquiterpene hydrocarbons present in the virgin olive oil meet the requirements from above, and are robust geographical markers of this commercial product. Also, since they are semi-volatile compounds, they can be easily analysed with a widely used analytical tool — mass spectrometry-coupled gas chromatography — with a previous solid-phase microextraction, a relatively quick and automated procedure which does not require the use of solvents."

The new protocol can authenticate virgin olive oils through a fingerprint, which works similarly to the recognition of people using fingerprints. "In this case, the sesquiterpene fingerprint is used for the development of geographical discrimination models that enable us to identify those oils that show an analytical signal very different from those considered as reference oils," said researcher Stefania Vichi.

"Traditionally, reference methods for the authentication of products are based on the determination of one or a few compounds, so that the legal limits are set to decide whether the product meets certain specifications. Non-directed methods — like fingerprinting — enable using all the available analytical data, instead of focusing on certain compounds like traditional methods do," noted researcher Alba Tres.

The process of transforming an analytical method into an official methodology with a legal validity is slow and complicated, especially if the provided innovation is based on an untargeted approach. In the case of the new technique, created in collaboration with the virgin olive oil producers, the first potential users would be the inspection and control laboratories, certification entities and marketing companies of the olive oil sector.



Several 'mini' conveyor lines, running side by side and at different speeds, cause bunched-up groups of bottles to be fed into a single line.

Nothing like a splash of smooth red

Taking the time to plan and prepare has paid dividends for this winery, after a re-design and refit of its bottling plant. Completed in only eight weeks, the upgrade required new drives for the bottle-conveyor system, plus the addition of air conditioning and hospital-grade air filtration. The result? Three years on, productivity is up by 50% while energy consumption is down, despite the power requirements of the additional equipment.

At a time when energy costs continue to spiral upwards, saving energy is not just good for the environment. It is just as important for the commercial bottom line. According to Jesse Auricht, Engineering Manager, Yalumba, decisions taken when planning the upgrade have turned out well in both regards. He says the choice of energy-efficient SEW-EURODRIVE MOVIGEAR® mechatronic drive units to keep the conveyor lines and bottles moving contributed significantly to this positive outcome.

The winery is serious about reducing energy costs, and monitors energy consumption continuously. Auricht says that typically half the cost of energy is based on network charges, so it is important to avoid any spikes in consumption as the wine bottles are filled, capped, labelled and packed in the bottling plant. "In the energy market, 50% of your cost can be dictated by a half-hour event," he says. "If you hit that peak once, depending on the time of day, you'll see an ongoing energy cost increase."

John Gattellari, National Industry Specialist – Food & Beverage, with SEW-EURODRIVE, says the MOVIGEAR units are carefully designed to minimise the use of electrical power and help manufacturers make savings. MOVIGEAR complies with efficiency class IE4 (Super Premium Efficiency) and reduces energy costs by up to 50%, due to the high efficiency of all its components.

Planning pays off

Once it was clear that the plant needed refurbishing, Yalumba decided not to rush in. Instead, they embarked on a precision planning exercise that led to a completely redesigned system. Starting with their own design concepts, they issued a tender for detailed design and implementation of the project, and awarded it to Foodmach, a specialist Australian provider of machinery-design, manufacturing and control services.

Working closely with Yalumba, Foodmach designed and installed the new conveyor and line control system. The revamped system consisted of the original bottling line with new controls, a new conveyor and new palletisers, and a second line with a new de-palletiser, filler and packer.

A radical new layout of the two conveyor lines meant that all the operators would be working in a shared space, so they could help each other for changeovers and other tasks.

SEW-EURODRIVE's engineering and customer service together with the energy efficient MOVIGEAR mechatronic drive system and high precision servo motors and MOVIDRIVE controllers were fundamental in obtaining the desired result.

In addition to saving costs by reducing energy consumption, the upgrade led to a safer work environment, as forklifts no longer enter the bottling operator area. Instead, because of the improved layout, the bottles are palletised outside the main bottling area, away from pedestrian traffic.

The upgrade also provided an opportunity to solve an engineering challenge in the labelling area. Labels on wine bottles need to look good. If the corner of a label is lifting slightly from a bottle on display, the consumer may select a different bottle.

One of the problems for wine bottlers is condensation build-up in the labelling area due to the prevailing dew point temperature. If the wine temperature is lower than the dew point, there is a likelihood that the labels won't adhere properly. To overcome this, Auricht and his team introduced an enclosed air-conditioned room around the bottling area, set to the correct dew point. At the same time, they introduced a positively-pressured, hospital-grade filtration system to maintain clean conditions.

"It was a large investment for something that might have seemed trivial at the start but, in hindsight, everyone is rapt with the decisions that were made. We look back now and don't know how we managed without that room," says Auricht.

Noise amplification — and reduction

While solving the dew point problem for better labelling conditions, the fully enclosed air-conditioned room introduced additional noise. "By effectively putting it in a big esky, all the noise in the bottling area was amplified," says Auricht.

The issue of noise is significant, especially given the running speeds of the conveyors. Line 2, which is used for wine only, runs at 12,000 bottles per hour. "You get glass bottles banging into each other at that rate and it's noisy — and potentially dangerous as well," he says.

Trevor Burgemeister, Process Control Technician at Yalumba, says that to alleviate the noise and danger of uncontrolled collisions, the system has been designed to detect when bottles are about to collide. When this happens, it sets a maximum collision speed.

Auricht says that to achieve this, the drives need to be accurate, reliable, efficient and controllable. As for the noise component, he says that the MOVIGEAR is so quiet it's negligible in comparison to the rest of the system. These characteristics, along with past performance and a strong relationship, were major factors in the choice of SEW-EURODRIVE. "They have been a solid partner of ours for a long time. It's a recognised brand and we've had a lot of success," he says.

No pressure

Key to reducing the noise is creating a 'pressure-less line'. In this case, pressure refers to the accumulation of bottles at any point on the conveyor system, and not to the pressure of the wine within the bottle. It occurs when the conveyor is transporting more bottles than the individual machine process rate. If a processing machine for filling, capping or labelling is operating at a slower speed than bottles are being delivered, the bottles bump into each other, and that familiar sound of glass against glass can be heard. On a grand scale, though, it's not a pleasant clinking sound that you might hear in a restaurant. At a rate of thousands of bottles per hour, it's more of a cacophony.

Auricht says that if the conveyor keeps running when this happens, the pressure continues to build up. This means energy wastage, inefficiency and noise, along with wear and tear on all the conveyors.

On Line 1, which is used for many different bottle types ranging from sparkling wine with a cork to table wines with screw tops, the flow is between 5,000 and 9,000 bottles per hour. While the aim is zero pressure on the conveyors, the processing machines require a degree of pressure to function correctly. To achieve this, the conveyors on this line run at set speeds, while the line's process machines vary their speed as necessary to maintain head pressure of between five and eight bottles.

In the Foodmach line control system speeds are controlled by software programmed according to a 'recipe' that varies for each production variety. The recipe specifies which processing machines are required for the product and also their operating parameters. Recipe data — speed, diameter of bottle, gap between bottles and the like — is communicated from the programmable logic controller (PLC) to the SEW-EURODRIVE gears and units. These are calibrated so that the speed of the conveyor is set correctly. Burgemeister says that connecting the motion-detecting sensors to the motors and gear units, in order to manage the flow of bottles, was a simple operation. "It was just a matter of plugging the photoelectric in," he says.

If further calibration is required during production, or if pressure build-up does begin to occur at one of the process machines, the conveyors are progressively halted to correct the situation. At the same time, the machine will be instructed to operate faster, so that the flow evens out again.

Gavin Alder, Foodmach's Controls Manager, says: "An added benefit of such fine line control is the ability to run reverse taper bottles (bottles wider at the shoulder than the base) which traditionally are difficult to run at speed, as bottle collisions result in fallen bottles."

Poetry in motion

Correct flow is set up at the start of the operation on the Foodmach de-palletisers, where thousands of bottles per hour are fed into the two bottling conveyor lines. At this point, several 'mini' conveyor lines, running side by side and at different speeds, cause bunched-up groups of bottles to be fed into a single line. Complex programming, communicated to each MOVIGEAR drive in the system, makes the operation look easy. For Auricht, this is what good engineering is all about. He describes the process with a single word: "Poetry."

According to Gattellari, the compact design of the MOVIGEAR is optimised for horizontal conveyor systems like these. "The motor, gear units and electronics are combined in a single mechatronic drive system," he says. "It caters for a range of communication systems, single line network installation (SNI), SEW system bus controller (DSC), binary (DBC) or AS-interface (DAC)."

Taking it to the world

A flow-on benefit of the well-planned upgrade has been preparedness for recent tightening of international quality standards in the wine industry. Because of the upgrade, the plant has continued to achieve positive audit outcomes, resulting in consistent export sales for this important Australian industry.

"This was probably one of our most successful projects undertaken — both in timeframes and outcomes," says Auricht. "In the scheme of things, the premium for the high-efficiency, low-energy drives was not that much and, looking back on it now, it absolutely was the right decision."

MOVIGEAR® complies with efficiency class IE4 (Super Premium Efficiency) and reduces energy costs by up to 50%.

SEW EURODRIVE

SEW-Eurodrive Pty Ltd
www.sew-eurodrive.com.au

Docker containers with REST API

The edgeConnector products from Softing's dataFEED range now include a REST API, making integration into configuration platforms easier. In addition, a new licensing model offers more flexibility when deploying the individual products.

The REST API in version 3.0 of Softing's edgeConnector products makes local or remote configuration much easier for users. The product family currently includes edgeConnector Siemens, edgeConnector 840D and edgeConnector Modbus. The software modules are based on Docker technology and provide access to process data in SIMATIC S7, SINUMERIK 840D and Modbus TCP controllers. In the past, a separate login via the local configuration interface was necessary for each product. This is now done by the new edgeConfigurator, which allows all edgeConnectors to be accessed via the REST API. The edgeConfigurator is also based on Docker technology and is used in parallel with the edgeConnectors. The configurator can be deployed on-premise or additionally in the Microsoft Azure cloud, allowing REST API access from the cloud to the edgeConnectors' on-premise environment. Using the REST API, edgeConnectors can now be configured more easily from a third-party application.

The new licence model of version 3.0 distinguishes between Basic (edgeConnector Modbus), Advanced (edgeConnector Modbus and edgeConnector Siemens) and Premium (all edgeConnector products). The licences no longer refer to data points; instead they only account for the connected controllers. The user can choose between licence options of 1, 5, 10 and 20 connections.

Ti2 Pty Ltd
www.ti2.com.au

Leakage valve

The GEA Aseptomag LV leakage valve is a mix-proof double-seat valve designed for extended shelf life (ESL) process lines. The valve has been designed for flexibility and to mitigate the risk of contamination, while also boosting the life of manufactured products by protecting them from bacterial contamination.

The valve has been developed to be used in the manufacture of products that do not require an aseptic method of hygiene but that still need to be treated in a careful way. As such, extended shelf (ESL) products such as iced tea, juice and milk can be processed without the need for a separate sterile chamber.

The product uses stainless steel bellows to prevent bacteria and other unwanted microbes entering the chamber. Hermetically sealing valve stems result in a higher standard of hygiene. The double-seat valve is compact, meaning that it can be used in ESL processes with less space, and can be easier to install and maintain than aseptic alternatives.

The bellows prevents the elevator effect, or the unintentional introduction of microbes back into the product chamber, because it is inseparably welded to the surrounding components.

GEA Group
www.geagroup.com.au

Hollow cone liquid spray nozzle

The EXAIR ¼″ HollowStream liquid atomising spray nozzle provides a hollow cone spray pattern for pressurised liquids. The nozzles are applied to solve cooling, cleaning, foam breaking, rinsing and dust suppression applications for industry. The tangential flow design is vaneless, with wide open internal features to resist clogging while producing a uniform distribution in a ring pattern with medium to large droplets. The product's right-angle design is compact and works well with liquids containing particulate. Liquid operating pressure is up to 250 psi.

With HollowStream nozzles, the liquid is supplied into the body of the nozzle creating a swirling action within a vortex chamber. This vortex produces the spray pattern when the machined nozzle breaks the liquid surface tension as it exits the orifice into a controlled spray angle.

The product's stainless steel construction adds to its durability and corrosion resistance. It is CE compliant and available in a variety of flow rates.

Compressed Air Australia Pty Ltd
www.caasafety.com.au

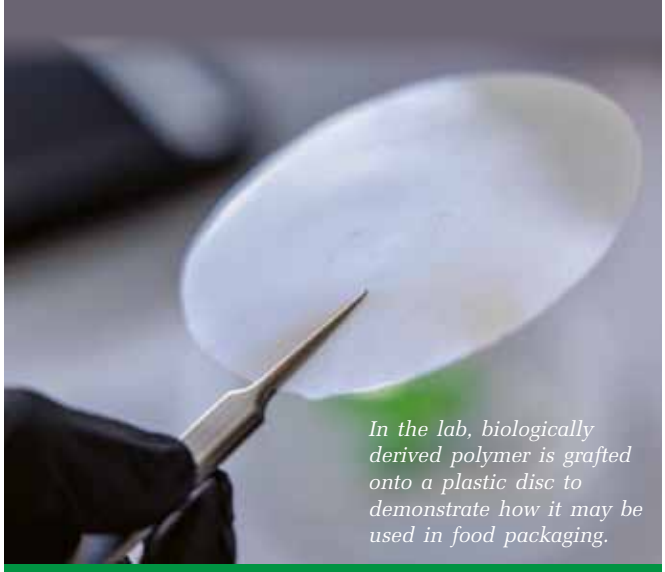


Image credit: Ryan Young/Cornell University

In the lab, biologically derived polymer is grafted onto a plastic disc to demonstrate how it may be used in food packaging.

Developing active packaging to preserve food and reduce waste

Cornell University scientists are finding ways to make active packaging materials that can address both the consumer demand for fewer preservatives and the environmental need for less plastic in packaged food. The latest research, which was published in June in the journal *Food Packaging and Shelf Life*, uses biologically derived polymer that helps salad dressings, marinades and beverages last longer in the fridge.

"Active packaging gives us a new way to prolong shelf life despite consumer demands for cleaner labels," said Ian Kay, a doctoral student in food science. "But it's tricky. Foods and beverages have varying and complex composition, so we need to know a lot about the chemistry of the food and the active packaging to figure out which system works for which foods."

Joshua Herskovitz, who studied in the laboratory of Julie Goddard, professor of food science in the College of Agriculture and Life Sciences, grafted the corn-derived polylactic acid polymer with the antioxidant nitrilotriacetic acid to use it in food packaging. Kay, following up on Herskovitz's work, figured out the material's 'interfacial pKa', which tells you at which pH the foods in this packaging might work to keep from spoiling.

As the antioxidant is bound to the polylactic acid, the preservative can interact with the food but not migrate into it.

"In other words, you get the shelf-life benefit of the preservative without consuming it," Goddard said. "This allows for cleaner label foods, which consumers are really looking for these days."

"As a food scientist, I'm excited about new ways to reduce food and packaging waste," Goddard said. "I'm not anti-preservatives as a whole, we need to remember things we use in the kitchen like heat, salt and lemon juice are important ingredients in food preservation.

"So if we take preservative out of our food, at the same time, we need to think about the environmental impact if food spoils faster," Goddard said. "Using a greener active packaging technique, we can extend shelf life while moving closer to a circular plastic economy."

The use of Radial Flow Column (RFC) for large-scale chromatography processes

Michael Feische, Head of R&D, Albert Handtmann Armaturenfabrik GmbH & Co. KG

RFC columns for lactoferrin extraction

Huge market growth

Lactoferrin (LF) is found in the milk of all mammalians, also in milk and whey derived from cow milk. It is an 80 kDa iron-binding protein and represents about 0.3% of the total protein content of milk, which equals 60–200 mg/L. The thermal stability is 55°C.

Lactoferrin is a very powerful protein: it has antibacterial, antiviral, antifungal, anti-tumor, anti-inflammatory and anti-allergic effects. Isolated from cow's milk, it is therefore a sought-after additive for foods such as functional food or sports nutrition. The use of lactoferrin has exploded in recent years, particularly as a supplement for baby nutrition.

Column chromatography

In chemistry, chromatography refers to all those physico-chemical separation processes in which the separation process is based on the distribution of a substance between a mobile and a stationary phase. Different substances of a sample are retained to different degrees by the stationary phase, while the mobile phase takes over the transport. Chromatographic analysis methods can include the following: classical column chromatography, high-performance liquid chromatography (HPLC) or ion exchange chromatography (IEX) as a special form of HPLC.

Fast protein liquid chromatography (FPLC) is a form of high-performance liquid chromatography that is often used for the analysis or purification of protein mixtures. In FPLC, the mobile phase is an aqueous solution or 'buffer'. The buffer flow rate is controlled by a positive displacement pump and maintained at a constant flow rate. For equilibration and elution, substance-specific buffers are required. To adapt the elution to the substance to be separated, the buffer composition can be varied by dosing the individual components from external containers. The stationary phase is usually a spherical resin, which for example consists of cross-linked agarose or polymethacrylates, packed in a cylindrical stainless steel column. FPLC resins are available in a wide range of particle sizes and surface modifications, depending on the application.

In ion exchange chromatography, substances can be separated according to their charge. It is based on the formation of heteropolar bonds between the matrix and the mobile phase, whereby the desired charged protein binds. The elution can be done by means of gradients. As soon as the charge binding between eluent and protein is higher than between matrix and protein, the protein migrates into the solution. By detecting the flow at 280 nm, any passing protein can be detected as a peak. In lactoferrin recovery, LF is obtained by ion exchange chromatography.

What is radial flow?

The radial flow stands for a continuous flow and high flow rate through the entire adsorber (24/7), a low differential pressure at a high flow rate, the processing of large feed volumes and a good scalability by increasing the separation distance of the corresponding radial flow column.

More advantages of RFC are the following:

- Bidirectional flow
- Ability to sterilise and autoclave the column
- Availability of different screen sizes
- Small footprint
- Low dead space volume
- Minimum P
- Robust design
- Specific packing station for easy packing and unpacking, together with minimizing chromatographic resin losses

The standard column volume (CV) is 240 and 260 litres respectively at a separation distance of 13.5 cm. In principle, up to 2000 litres of resin volume per column are possible. For beer applications, this will allow processing flow rate of ~ 22,000 litres per hour, for milk applications ~15,000 litres per hour.

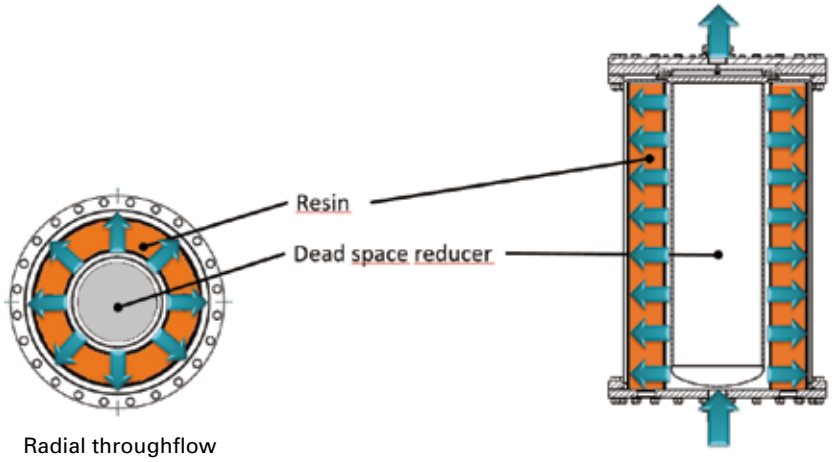
Axial vs. radial flow column

While an axial flow column design offers the advantage of a higher flexibility in the separation distance, the radial flow column has much more to offer. Below are the specifications for a radial flow column, which make a radial flow column superior to an axial flow column:

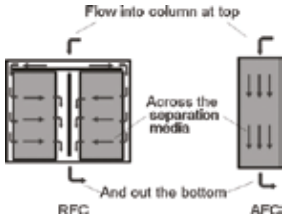
- Reduced pressure drop of 20–50 %
- Improved loading efficacy
- Reduced feed handling complexity
- High binding kinetics (dynamic binding capacity)
- High process robustness (larger process tolerance window)
- Higher throughput
- Higher efficiency
- Higher purity

Is it possible to convert existing processes from axial to radial flow columns?

A conversion from an axial to a radial flow column is possible as long as the required separation distance for the efficient separation is max. 13.5 cm, which is in most of the ion-exchange based chromatography processes the case. The change from axial to radial can be justified as described above: radial flow columns have significantly lower pressures than axial columns. This means that the column can be operated at a higher flow rate, resulting in a higher throughput and, in relation to time, a higher turnover.



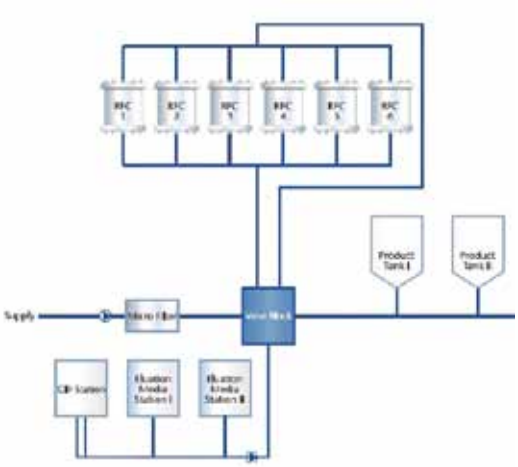
Radial throughflow



Example for axial and radial flow chromatography flow patterns

How to extract lactoferrin from milk

For the industrial extraction of the protein lactoferrin from milk and whey, radial flow columns are used. The whole milk is collected at dairy farms and stored in refrigerated conditions until quality test passed and transported to a dairy processing facility. Once the milk arrives at the dairy facility, it undergoes cream separation to remove fat and collect skim milk. Then the skim milk goes through a pasteurizer to kill pathogenic bacteria before any further process. For bovine lactoferrin (bLF) extraction, the ideal option is to extract the lactoferrin before the pasteurizer process step. In such cases, skim milk is pumped through a chromatography column packed with a suitable resin (strong ion exchanger) until the maximum binding capacity of the resin has been reached. The column is then washed with water and low salt buffers, before the bovine lactoferrin is eluted by applying a buffer with high salt solution. Afterwards the resin in the column is regenerated for next purification cycle by a CIP procedure using sodium hydroxid (NaOH). The purified lactoferrin-/salt solution is further processed to remove the salt and concentrate the solution by diafiltration (DF) and ultrafiltration (UF). LF is further concentrated using a second UF process step and then dried using freeze-drying or spray drying technologies. The powder is formulated and packed to a desired pack size.



Process flow of lactoferrin extraction

Applications of column chromatography

In addition to lactoferrin extraction, the radial flow column is also used in the food industry and in large-scale chromatography processes. Here are just a few areas of application:

- Bitter substances from citrus juices
- Polyphenol reduction in beer
- Taurine extraction
- Extraction of potato protein
- Taste and smell removal from collagen
- Removal of riboflavin from whey
- Milk and whey protein purification

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For more details, contact Handtmann Group's Australian agent, Sandy Ross at Rossbrew on sandy@rossbrew.com.au.

Round bar material for food sector

Treotham has expanded its range of igus iglidur round bars with four materials; among them two for the food sector: the heat-resistant material iglidur AC500 and the resilient material A250. The hard-wearing material iglidur H3 and the wear-resistant endurance material iglidur E complete the product range. This makes it possible to mill and turn lubrication-free and maintenance-free prototypes and special components for a wide variety of applications.

For the production of special bushings, rollers and other sliding elements that come into contact with food, igus has developed iglidur AC500 — an FDA-compliant high-temperature material for the food industry that withstands extreme temperatures of up to 250°C. Thus, components made of AC500 are suitable, among other things, for sliding elements in baking lines. When a plain bearing made of AC500 rotates on a high-grade stainless-steel shaft, wear is only 0.16 micrometres per kilometre, as tests in the in-house test laboratory showed. In addition, the material has high chemical resistance, so that it withstands cleaning agents common to the food industry. Lubrication is not necessary in this case. A double advantage, as the risk of contamination and the maintenance effort are reduced.

The iglidur A250 round bars from Treotham are also predestined for the food and packaging industry. They are suitable, among other things, for the production of so-called knife edge rollers, which are used in the deflection of conveyor belts. In this function, the material reduces the drive power required and the energy consumption of the belts thanks to its low-friction, lubrication-free dry operation. In addition, the material impresses with its high load-bearing capacity. iglidur A250 is designed in such a way that it can be used for high belt speeds in the food and packaging industry. And just like AC500, A250 also has the approval for direct contact with food. The material complies with the hygiene guidelines of the US Food and Drug Administration (FDA) and EU Regulation 10/2011.

iglidur H3 was developed primarily for contact with aggressive media and the application in pumps, eg, in fuel pumps. The fourth material is iglidur E, which is used to manufacture plain bearings that dampen vibrations in combination with aluminium shafts.

Treotham Automation Pty Ltd
www.treotham.com.au

Stainless steel enclosures

The new Kraus & Naimer enclosures added to the 6S Series of stainless steel enclosures provide rigorous protection for vital switchgear but with the same footprint as the plastic versions, combined with bottom threaded entries and four screw cover fixings with removable mounting feet.

Suitable for dairy and food & beverage industries, the enclosures can also be used in sewerage treatment plants, mining and marine.

The enclosures are Australian manufactured, constructed from 1.6 mm 316 stainless steel and are rated to IP66.

Kraus & Naimer can also meet users' unique application needs, such as EMC/RFI screened glands suitable for stainless steel, mild steel or plastic enclosures.

Kraus & Naimer Pty Ltd
www.krausnaimer.com.au

Air compressor

The latest compressor from Kaishan, the PMV 250, uses permanent magnet motors and variable frequency drive technology. The combination of integrated systemic optimisation of the compressor unit with an advanced permanent magnet motor, SKY 2-stage airend and rapid response variable speed drive is said to result in a compressor that needs less energy input to drive an efficient compressor while generating greater output.

Rare earth technology gives the permanent magnet motor higher energy efficiency compared to conventional induction motors. PM synchronous torque motors provide faster acceleration and deceleration, a great advantage in compressor applications as they can rapidly vary output to match application demands.

With integral variable speed control, the compressor operates at the level of immediate demand, reducing both input energy needs, machine wear and tear and maintenance requirements. These air compressors are therefore designed to deliver high efficiency and performance in a heavy-duty machine that is also said to possess durability and reliability.

Kaishan offers the PMV compressors in power ranges from 15 to 250 kW to suit the needs of a wide range of industry applications.

Kaishan Australia Pty Ltd
www.kaishan.com.au

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Our in-depth knowledge of the food processing environment gives us the edge. This expertise enables us to provide food processing solutions industry wide. We specialize in processing techniques of raw materials and ingredients, product and process development, machinery selection, installation and project management, providing on site configuration and training to build your operational expertise.

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ASTECH automatic bandsaw, portion cutting
KOLBE bandsaws, mixing/grinding, grinding
TREIF slicing, dicing, portion cutting
SCHRÖDER injecting, brine mixing, massaging
REX vacuum filling, auto linkers, mince lines, forming attachments
STEPHAN cutting, mixing, emulsifying
LORENZO BARROSO clippers
VAKONA vacuum, massaging, tumbling, mixing, marinating
REICH smoke houses, ovens, fermentation rooms, water cookers
BOSS vacuum packing, dip tanks, auto packing lines

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info@cbsfoodtech.com.au

AVEVA Plant SCADA 2020 R2 taps into the full potential of the AVEVA Portfolio

As global industry accelerates plans for digital transformation and seeks reliable and flexible SCADA solutions, many companies are shifting to tightly integrated stacks of solutions to solve increasingly interconnected operational challenges.

As HMI/SCADA software continues to evolve, AVEVA™ Plant SCADA has grown as well. You'll find it easier than ever to explore solutions that deliver collaboration, skills management, deep analytics, and artificial intelligence. Industrial operations must reimagine traditional HMI/SCADA to support the future potential of operations control.

AVEVA Plant SCADA unlocks the full potential of integrated operations control

AVEVA is already exploring ways to bring the familiarity of traditional HMI/SCADA software to a more integrated style of operations, centered around common information platforms and unified operations. AVEVA Plant SCADA represents an example of the way legacy SCADA software can be updated to play a powerful role in unified operations while maintaining features that customers have come to rely on over decades.

AVEVA Plant SCADA began its development lifecycle as a part of Citect, and quickly gained dominance of the SCADA market in the Asia Pacific region. When Citect became part of Schneider Electric and then AVEVA, Citect SCADA was integrated with the AVEVA portfolio.

Now, the same team who brought you Citect SCADA brings you AVEVA Plant SCADA. They've kept the features customers have come to rely on like legacy image libraries and graphics editors, but they've infused Plant SCADA with common tools shared across AVEVA's rich portfolio, like

industrial graphics and a powerful read/write web client based on HTML5.

Comprehensive operations with AVEVA

AVEVA hasn't just made this trusted SCADA software better, it has made it a full part of AVEVA operations capabilities. Operations control is a framework of information and teams that allow organizations to break down operational silos and show one unified vision of operations that managers and operators can use to make better decisions and improve processes.

Plant SCADA serves an important role within operations control, and organizations using Plant SCADA can already take advantage of other powerful AVEVA solutions designed to unify systems and teams. For example, Plant SCADA supports industrial graphics, which allows users to import and export rich graphics libraries to other systems.

AVEVA Connect is another important piece of the AVEVA operations control portfolio. Within AVEVA connect, Plant SCADA users can centralize their data with AVEVA Data Hub or use AVEVA Insight to understand their asset health and performance.

AVEVA Plant SCADA is also a part of AVEVA Flex, a subscription credits system that allows customers to use the entire AVEVA operations portfolio with much lower upfront costs. Want to use FLEX to augment Plant SCADA with the edge management solutions of AVEVA Edge? Now you can! Want to bring Plant SCADA data directly into a Unified Operations Center? AVEVA Flex makes it possible and cost-effective to start experimenting with more complex system architectures and take advantage of powerful automation tools.

AVEVA Select Distributors offer a personal touch

As an AVEVA Select Distributor, Schneider Electric offers the full AVEVA portfolio. This allows them to provide a personal touchpoint for companies executing their digital transformation plans as they explore new ways to structure their teams and break down information silos for a more unified experience of operations.

Schneider Electric's partnership with AVEVA provides a rich set of solutions that help organizations optimize operations and asset performance, and more easily adopt technologies like artificial intelligence, industrial IoT, big data, cloud, and hybrid-cloud capabilities.

Upgrading to AVEVA Plant SCADA

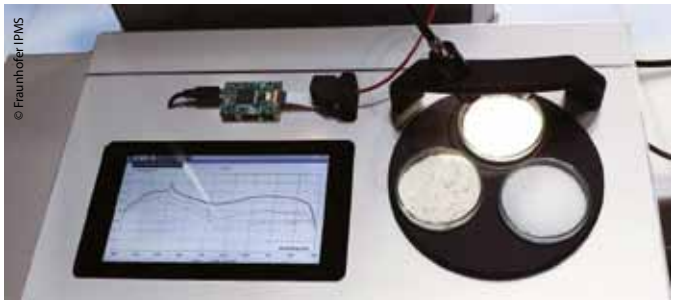
AVEVA and Schneider Electric always recommend that you use the most recent versions of software to mitigate security risks and implement the latest features and capabilities. If you're currently using a legacy edition of Citect SCADA, updating to AVEVA Plant SCADA will bring you the future-ready technology you need to stay competitive.

Never used AVEVA Plant SCADA? Contact our team to request a demo so we can demonstrate how you can reduce your operating costs and improve productivity and product quality.

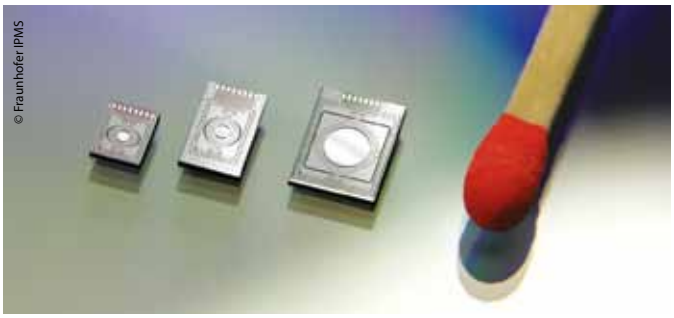
Schneider Electric
se.com/au/getreadyformore

Mobile analysis

Example of a mobile on-site food analysis using avocados.



Demonstration system for the identification of white powders.



Example of the miniaturised MEMS scanning mirror.

In food manufacturing, it is crucial to correctly identify visually similar substances, such as sugar and salt. Complex compositional analyses can also provide information about the quality, ripeness or freshness of products. Fraunhofer IPMS is currently researching and developing small energy-efficient scanner systems, which enable non-contact and mobile freshness testing onsite using near-infrared spectral analysis.

Near infrared (NIR) spectral analysis has been used in the laboratory to determine the food's freshness. Highly accurate instruments are able to provide precise information about the condition of the product at the time of measurement. However, it becomes problematic when the sample changes in the period between sampling and measurement in the laboratory, or when results are needed quickly. Many new applications could benefit from NIR spectral analysis if the systems can be miniaturised sufficiently for mobile use and made available at low cost.

For this reason, the Fraunhofer Institute for Photonic Microsystems IPMS is developing small analysis devices that can be integrated into handheld devices such as tablets or smartphones.

The use of micro-electromechanical systems (MEMS) enables compact systems that can be manufactured cost-effectively in large quantities. The quality of the measurements is suitable for many applications despite the small size and the data can be chemometrically analysed onsite or online. This makes it possible, for example, to make direct statements about the ripeness and freshness of food. Other applications include checking correct mixing ratios in food processing or making selection of food for recycling or re-use processes.

Current research at Fraunhofer IPMS combines a simple technology for the MEMS component with a large addressable spectral range of the system and a high degree of modularity. The core of the system is a MEMS scanning mirror, which deflects the incident collimated light beams onto a grating mounted in the system. A selection of different spectral diffraction gratings is possible, which can be optimised and used for specific applications.

The current demonstration system, which can also be seen at the Fraunhofer IPMS booth at the Analytica trade fair in Munich from 21–24 June, addresses the proven spectral range from 950 to 1900 nm with a spectral resolution of 10 nm. Currently, the system achieves a build volume of about 2 cm^3. However, further miniaturisation is possible.

The measurements are performed in typical arrangements depending on the sample properties, for example in transmission for liquid media or sufficiently transparent solids or in diffuse reflection for less transparent samples with sufficient scattering in cross-section. The optical coupling of the spectrometer is possible as free-beam optics or via coupled fibres. In the demonstration system, the detection of white powders is shown. This could be salt, sugar, starch or flour, but numerous substances that appear visually similar can be detected and assigned.

"In the context of evaluating food quality parameters, it has been shown that pressure and damaged spots can be detected very early on, using apples as an example, so that suitable selection allows recovery with the highest possible added value and minimises avoidable destruction," said Dr Heinrich Grüger, scientist at Fraunhofer IPMS. Quantitative analyses are also possible using appropriate mathematical models and compositional analysis has been implemented to evaluate the quality of olive oil.

Applications in the agricultural context range from soil evaluation to monitoring growth to maturity evaluation for harvesting, then in the supply chain context, in storage, logistics and distribution. At the 'point of sale', an important application is for the selection of goods to be sold at a reduced price for immediate consumption just before they lose freshness, instead of disposing of them the following day. On the other hand, simpler systems can be developed for the private user at home.

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NEWS

Recycled plastic wine bottle launches in Australia

A plastic wine bottle made from 100% recycled plastic is launching in Australia. Coles will soon be carrying wines packaged in Packamama's eco-bottles, with certain products from Accolade Wines' Banrock Station and Taylor Wines' One Small Step ranges packaged in the bottles available in select Liquorland and First Choice Liquor Market stores.

The bottles are made of PET and are 100% recyclable. They are 83% lighter than glass ones and due to their flat shape — intentionally designed to have a silhouette similar to traditional Bordeaux wine bottles — can be packed more tightly. This means more bottles can be transported in the same truck, saving money and reducing relative emissions per bottle.

Packamama has said that it is hopeful that the bottle, despite straying from conventional and historical designs, will prove to be a good choice for winemakers.

CASE STUDY

Compostable packs for organic apples

R&R Smith has upped its environmental commitments, ditching plastic in favour of organically recyclable packaging.

TIPA's home-compostable bags will be used to package R&R Smith's 1.5 kg bags of Pink Lady and Royal Gala apples.

The shift comes in response to consumer demand and Australia's incoming phase-out of single-use packaging by 2025. R&R Smith's entire produce pack — including packaging and any apple remains — can now be fully decomposed in home compost or sent to industrial compost in Food Organics Garden Organics (FOGO) bin, making the company's products fully circular.

R&R Smith has been growing apples in its Tasmanian orchard since 1888 and opened Australia's first certified organic apple orchard in 1998. Its apples meet the standards of organic certification through the NASAA (National Association of Sustainable Agriculture Australia). The company views the health of soils, people and the planet as one continuous, circular system.

While researching compostable solutions, R&R Smith chose TIPA due to its high regulatory certifications to ensure authenticity, transparency, strength, quality and food-safe processing from the orchard to the consumer.

TIPA supplies compostable films and laminates that mimic plastic, and recently expanded into the ANZ market. Its compostable packaging solutions perform like conventional plastic and are certified compostable, leaving no waste behind.

R&R Smith provide apples for well-known brands, including Australia's supermarket chain Woolworth's and cider company Willie Smith's Organic Cider.

Andrew Smith, Managing Director of R&R Smith, said: "We know that our customers want sustainable alternatives to single-use plastic, and we are extremely proud to introduce the first fully home-compostable package for our pre-packaged fruit.

"TIPA has provided the best solution for our produce, and we are pleased that our packaging now returns back to organic matter, making our products fully circular."

Chen Katz, Chief Revenue Officer at TIPA, said: "Interest in compostable packaging is booming and this has been driven by positive environmental legislation and consumer demand for plastic alternatives. TIPA's technology is prepared to meet this demand, and we are ready to support the Australian market transition to compostable packaging."

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Shelf-ready carton

The Abbe Wingman shelf-ready carton packaging has been designed with a different orientation that allows more product to be packed, resulting in more product on the shelf.

The packaging is quick and easy to open in-store, and a clean die-cut front lip provides for good shelf presentation. The shape of the lip can also be customised for increased brand awareness.

With perforations located on the side of the carton, the chance of corner damage is reduced. This design also helps to improve the stacking strength when compared to a traditional shelf-ready RSC.

A common problem of product settling to the bottom of a pouch or bag can be resolved as the pouches can be loaded flat in the shelf-ready carton.

Designed for a variety of different types of packaged products, the carton can also provide possible supply chain savings as additional products may fit into the carton and pallet.

Abbe Corrugated Pty Ltd
www.abbe.com.au

Flowpacking solution

The MULTIVAC W 500 universal flowpacking solution is suitable for packing a wide range of food products.

Designed for a wide spectrum of applications and products, it supports the use of sustainable films and paper-based materials.

On display at Anuga FoodTec 2022, the solution can be used for the automatic packing of burgers in a pillow pack. The pillow pack is traditionally one of the primary solutions for the packaging of food products, such as meat and sausages, cheese, snacks, bakery products and fruit. Pillow packs are also widely used to protect industrial and pharmaceutical products. The low material input and the ease of integration into other processes are the main features of this packaging solution, and the flowpacker complements the current MULTIVAC product range.

Features include user-friendly operation, easily accessible for cleaning and maintenance, and it can be used as a standalone solution or integrated into an automated line.

The solution is suited to the sustainable packaging of products such as minced meat, burgers, cevapcici, sausages, cheese and frozen fish. And bakery products such as baguettes, croissants and pizzas, as well as many types of fruit and vegetables, can also be packaged securely in pillow packs with efficient material usage.

The machine is built to MULTIVAC's Hygienic Design. Servo drive technology ensures that maximum speed and optimum process control are achieved. Products with a maximum width of 200 mm and a height of up to 120 mm can easily be packed — with or without a tray.

Other features include the independent speed setting of the rollers for crease-free longitudinal sealing, and cross sealing thanks to recipe-based control of sealing temperature and pressure, as well as an integrated gas analysis system for MAP packing with modified atmosphere.

Offering an output of up to 120 packs/min or a film speed of up to 30 m/min, the machine can also integrate marking or labelling solutions.

All process and pack parameters such as type of product, pack format, sealing pressure and temperature are recipe-based, and they can be set and called up with just a few clicks on the user-friendly HMI. Product changes can also be performed in a short period of time.

MULTIVAC Australia Pty Ltd
www.multivac.com.au

Edible QR coded tags

to verify alcohol authenticity

Image credits: Purdue University photo/John Underwood

Jungwoo Leem, a postdoctoral research associate, and Young Kim, both of Purdue's Weldon School of Biomedical Engineering, are part of a global research team that has developed an edible QR code on a tag made of specialised silk which could help consumers detect fake whiskey.

Researchers are tackling bottles of counterfeit alcohol by making tiny tags with scannable codes that float inside the bottles, are safe for human consumption and can include information that is difficult to fake.

The tags, created by researchers from Purdue University and the National Institute of Agricultural Sciences in South Korea, are made from fluorescent silk proteins and are entirely edible. The tags feature scannable QR codes that contain information about the alcohol, such as batch data, date of production or any other unique information that can help verify the authenticity of the alcohol. The taste of the alcohol will not be affected and the code itself is not visible to the human eye, thus preventing it from being easily copied.

The codes are placed inside the bottle where they cannot be easily tampered with but can still be scanned through the glass vessel with a special smartphone app; currently, containers of alcohol do have methods to prove they are real but this information is on the packaging's surface so it can be illegally scrubbed off or otherwise removed.

The edible tag system was originally being developed to prevent counterfeit pharmaceuticals but the researchers have now applied it to whisky.

"Alcohol spirits are vulnerable to counterfeiting. There are a lot of fake whiskies being sold," said Jungwoo Leem, a postdoctoral research associate at Purdue University.

"Counterfeit items, such as medicines and alcohol, are big issues around the world. There are numerous examples of large amounts of fake medications sold throughout the world, which, in some instances, kill people," said Young Kim, one of the researchers on the project.

"Online pharmacies sell controlled substances to teens. People can buy counterfeit opioids easily. This work is extremely important for patients and buyers in addressing this issue. If you have this technology on or in your medicines, you can use your smartphone to authenticate. We want to empower patients to be aware of this issue. We want to work with pharmaceutical companies and alcohol producers to help them address this issue."

Anti-counterfeit methods for reducing medical and pharmaceutical fraud have an important role in protecting the health of the public, so edible ways of proving the provenance of medicines are popular at the moment; for instance researchers created an identification method for pills that uses hundreds and thousands.

The full paper outlining the edible QR tags was published in the *ACS Central Science* journal.

Metal detector and checkweigher

The C80 Shark Metal Detector Combi integrates the Teltek Checkweigher with the Cassel Shark 2 Advanced Multi-frequency Metal Detector. The high-speed unit is fully integrated as an inline inspection system capable of inspecting 500 packs/min, even metalised film packs.

Suitable for food industry requirements, the unit features a PC-based Windows operating system with a large 15″ multifunction touchscreen and a user-friendly touchscreen display that provides maximum operator flexibility.

Made from stainless steel with IP65 protection for use in tough environments, the unit's transport system includes a weigh platform that is designed to ensure weight stability, high accuracy and repeatability. Conveyors are driven by virtually maintenance-free brushless DC motors. The weighing mechanism is easy to clean with quick-release, tool-free belt release and incorporates an open designed stainless-steel corrosion-free load cell for longevity and trouble-free weighing.

A range of belt sizes and reject devices is available to suit users' requirements, including Air Blast, Pusher, Single or Double Flipper/Divert Arm and Drop Flap.

With networking, feedback and communications capabilities, reports can be saved locally or on the user's network in either Excel, CSV, XML or PDF format.

Other features include: integrated control change program from the main touch screen display; optional charts or large weight display; AQS control or minimum weight control; BRC requirement and supermarket specification; flexible user interface with multi-functional display options; fully able to communicate with other PC-based data collection; and onboard USB for data collection in Excel or PDF to data drive.

The OFI Weigh & Inspection Solutions Checkweighers and Metal Detectors have been certified 'Australian Made' by the Australian Made Campaign Limited.

OFI Weigh & Inspection Solutions Pty Ltd
www.ofiinspection.com.au

CASE STUDY

Rosella ladles up paper-based soup cartons

Australian food brand Rosella has begun using cartons in place of cans for some of its soups. Traditional cans will be subbed out for Tetra Pak's carton-based Tetra Recart packaging with four of its new-release flavours of soups: condensed tomato, tomato roasted pepper, carrot and potato, and pumpkin.

Weighing 60% less than cans, the packaging is designed to occupy up to 30% less space on shelves and 20% less space in transport vehicles. It therefore provides environmental and logistical advantages, and is also easy to open and pour.

Designed for shelf-stable food products traditionally filled in cans, glass jars or pouches, the retortable carton packaging is suitable for ingredients of almost any size such as vegetables, tomatoes, beans, baked beans, sauces, soups and ready meals. The packaging can help to maintain freshness and keep food safe at room temperature, all without the need for any preservatives.

"I am immensely proud of what we have been able to achieve in partnership with Tetra Pak with the relaunch of the Rosella Soup range. Our switch to the Tetra Recart package allows us to reduce our environmental footprint and contribute to a more circular economy, while also delivering the classic taste of Rosella's iconic soups for Aussies to enjoy," said Rosella CEO Michael Bartholomew.

Tetra Pak's Andrew Pooch said that the adoption of the carton would help the soups become more sustainable.

"There is a lot of focus on end-of-life at the moment, but in reality over 99% of packaging impact to climate change has occurred before products hit the shelf," Pooch said. "We are thrilled to be playing a role in the transformational journey of an iconic homegrown brand like Rosella by helping their products become more sustainable. It's great to see Rosella be the first brand in the Australian market to make the switch to Tetra Recart packages."

The soups are now available from Coles and Woolworths and some independent supermarkets around Australia.

Tetra Pak Marketing Pty Ltd
www.tetrapak.com/au

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CASE STUDY

A packaging sea-change

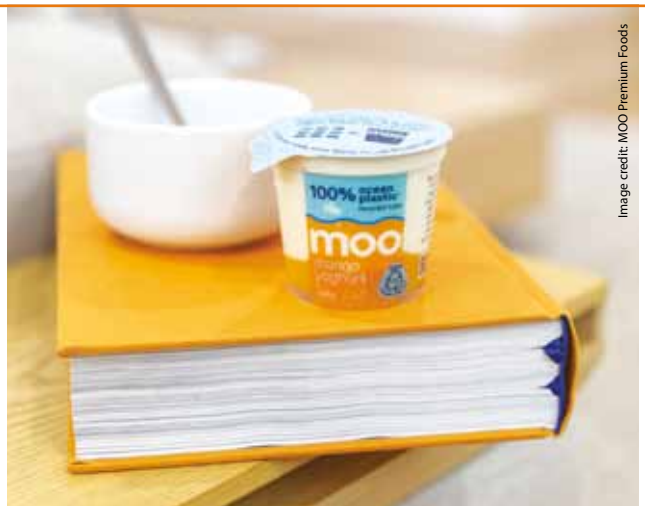


Image credit: MOO Premium Foods

An Adelaide-based yoghurt manufacturer is creating packaging using recycled plastic that was washed up on beaches. MOO Premium Foods will package its yoghurt in containers made from Ocean Bound Plastic (OBP), which is the term for plastics found in the ocean or within 50 km of a coastline that is not managed and is at risk of making its way to the water.

The company says that about 100 tonnes of plastic will be removed from beaches, oceans and waterways this year thanks to its containers. The plastic is sourced through Malaysian recycling company HHI, which works with locals to collect the oceanic plastic that is then recycled into resin and decontaminated to meet food-grade compliance. This resin is imported by MOO whose containers are made by TechnoPlas.

"This was an absolute game-changer. We finally had the opportunity to help clean up plastic pollution and make a real difference," said co-founder Mick Sanders. He had wanted to use a sustainable method of packaging for the company since being grilled about being environmentally friendly by primary school students at a question-and-answer event.

"At the very least, we knew we'd be able to make a yoghurt tub from a mix of new and reclaimed plastic, but we really wanted to push the boundaries. To finally see the resin and realise it could successfully be made into 100% reclaimed Ocean Bound Plastic tubs was fantastic."

HHI CEO Kian Seah said it was exciting to work with partners like MOO to realise new uses for reclaimed OBP and create products that can become part of a circular plastic economy.

"We have the ability to work towards a cleaner future, one that sees plastic as a valuable and reusable resource," Kian Seah said. "Ultimately, we hope that one day we won't have any ocean plastic to find — that will be a true success."

MOO has partnered with Woolworths, which will be offering its products around the country. The tubs, lid and foil are recyclable and the containers are designed to be functionally identical to regular plastic ones.

CASE STUDY

Bamboo packaging used for online meat deliveries

Caspak has developed a fibre modified atmospheric packaging (MAP) tray made from FSC Certified bamboo layered with a peelable plastic film for recycling ease. The packaging company has now partnered with Hagen's Organics to supply its online customers with meat packaged in the new bamboo tray.

The Caspak Fibre MAP tray features a peelable thin plastic layer that can be peeled away from the fibre tray so that the two materials can be easily separated, and the film can be recycled through the RedCycle soft plastics system. This high-barrier sealant film makes it suitable for an array of meat, seafood and ready-meal applications.

Hagen's switch to Fibre MAP Trays has resulted in an 80% total reduction in plastic from 20 g to just 4 g per meat tray.

The move was a 'no-brainer' according to Hagen's Taylor Matthews: "The bamboo nature of the Caspak trays ticks all of the sustainability boxes, and the peelable plastic layer works to ensure that our meat is delivered to our customers in the best possible condition. Our farmers put a lot of work into growing organic meat and this is the ultimate solution to extend those efforts right through to the customer."

When implementing the new Fibre MAP Trays Hagen's was able to use existing machinery and continue to use the existing shrink lidding film that was already on hand, resulting in a seamless conversion process with no packaging wastage.

In general, Caspak's Fibre MAP trays are designed to work with most existing product lines as there are no tooling changes required between plastic and bamboo trays.

Caspak Products Pty Ltd
www.caspak.com

Growing beer bottles on trees

The Carlsberg Group is working with Paboco and Avantium to produce its biodegradable and recyclable Fibre Bottle. The brewery has been working on producing a sustainable plant-based bottle since 2015 and now they are set to be trialled in eight European markets. If all goes well with the trial, the bottles will be widely launched in the future.

The bottle consists of three components, which are all recyclable:

1. The fibre-based shell of the bottle is made by Paboco from a sustainably-sourced wood fibre, which serves as insulation to keep the beer cool and protected.
2. A standard bottle cap is used to keep the beer fresh but fibre-based options are being explored for use in the future.
3. The bottle has a PEF-based lining produced from plant-based materials and developed by Avantium. The PEF layer functions as a barrier between the beer and the fibre outer shell, and offers protection for the beverage's taste and fizziness. Carlsberg claims this layer performs better than conventional petroleum-based PET plastic.

Stephane Munch, VP Group Development at Carlsberg, said: "We are delighted to bring our new Fibre Bottle into the hands of consumers, allowing them to experience it for themselves. This pilot will serve a greater purpose in testing the production, performance and recycling of this product at scale.

"Identifying and producing PEF, as a competent functional barrier for beer, has been one of our greatest challenges — so getting good test results, collaborating with suppliers and seeing the bottles being filled on the line is a great achievement!"

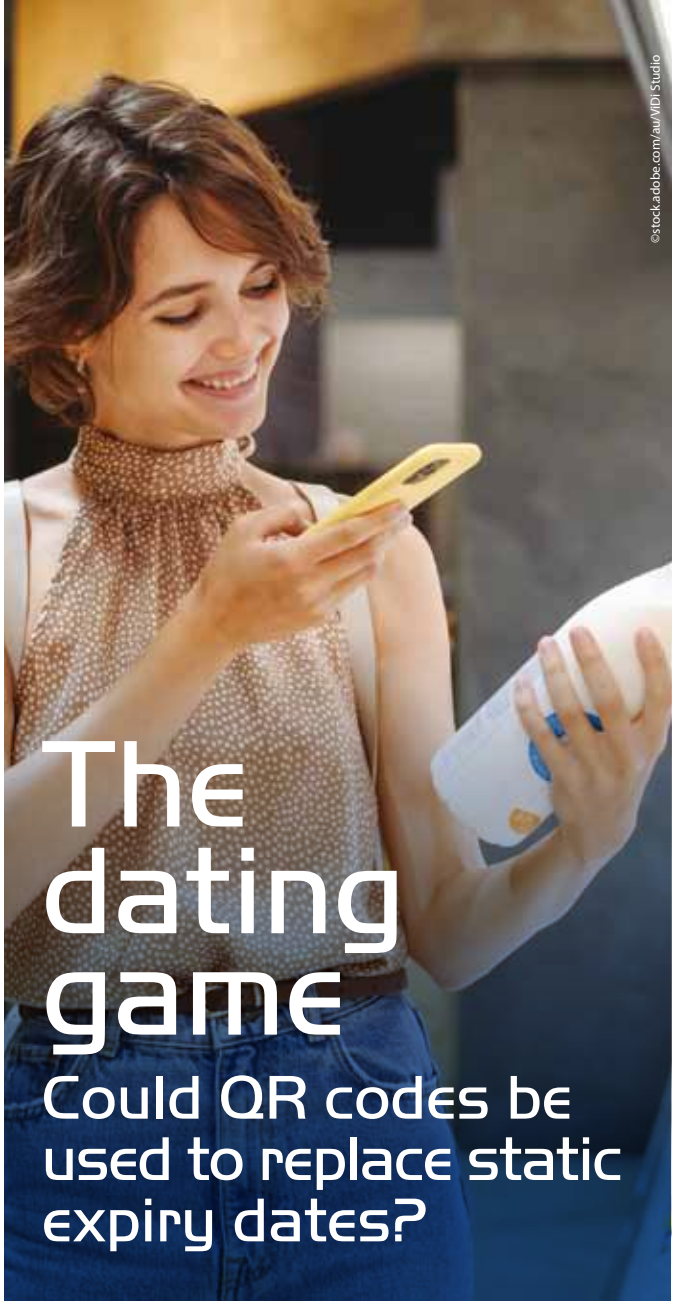
The bottle is also being filled with sustainably grown beer due to a partnership with barley malt supplier Soufflet. The beer's barley is being cultivated using organic and regenerative agricultural practices, with cover crops being used to boost the health of the soil used for barley growing.

Based on current projections, the emissions of the Fibre Bottle will be 80% less than single-use glass bottles and the aim is to achieve the same carbon footprint as a refillable glass bottle. Carlsberg is hoping that when it is commercialised and widely produced, the bottle will complement, rather than replace, existing packaging like glass bottles and cans.

"The progress made with our new Fibre Bottle is testament to Carlsberg's pioneering spirit, with a focus on making better products in every sense of the word," said Simon Boas Hoffmeyer, Group Sustainability Director at Carlsberg.

"We've been working hard on this project since 2015, and aim to continue to set the industry standard by further improving the bottle's environmental footprint and product performance. Collaboration is key and, together with our partners, we're excited to see how research and development into sustainable packaging solutions is now becoming the norm."

Carlsberg Group
www.carlsberggroup.com



The dating game

Could QR codes be used to replace static expiry dates?

Traditional static expiry dates printed on cartons and bottles of milk could be replaced with more accurate and informational QR codes, Cornell University researchers said.

Milk often ends up being wasted in retail environments for a number of reasons, but the main reason is the stock not sold before expiry date as consumers opt to buy the milk with the most distant expiry date.

The Cornell scientists conducted a study at its on-campus shop to compare milk with traditional expiring date labels and QR codes with the same information. At the same time, a dynamic pricing element was introduced to discount milk that had a shorter remaining shelf life.

"During [the] two-month study, over 60% of customers purchased the milk with the QR code, showing a considerable interest in using this new technology," said Samantha Lau, a doctoral student in food science and one of the study's authors. "This revealed that the use of QR codes on food products can be an innovative way to address the larger issue of food waste."

By using QR codes on milk with more accurate best-before information, researchers predict that consumers will buy milk that is closer to its expiry date, thus reducing perfectly good milk being left on shelves.

QR codes connect milk to the digital world, which could also help retailers collect information about the food chain and eventually could be used by a consumer's smart fridge to let them know when they're out of milk. This is because QR codes can hold more information than a simple expiry date, it can assess the drinkability of milk in the smart fridge and also even provide recipes.

The full paper, which also covers microbial spoilage of milk and various other ways to counter its impact on wastage, was published in the *Journal of Dairy Science*.

End-of-line packaging system

Endoline Automation has re-engineered its flagship case erector to create the slimline 251 Fully Automatic Case Erector, which features a 40% reduction in width.

The compact unit is just 1 m wide by 2 m long, allowing it to be easily integrated into existing end-of-line packaging lines within confined spaces, and providing an automated solution to replace manually intensive work.

Suitable for a wide variety of case sizes and styles, Endoline's dual opposing vacuum technology has been integrated into the unit to enable efficient opening of cases, while eliminating any associated issues with stiff board and glue migration which could cause product wastage.

Erecting up to 10 cases/min, the slimline case erector seals the base with either self-adhesive tape or hot melt glue, before formed cases are fed onto an automated case packer or hand packing station.

The unit is designed with clear access and simple controls. It is operator-friendly and allows for quick and easy size change, cleaning and maintenance for minimal machine downtime.

Built for the rigours of typical end-of-line packaging environments, the unit is housed in a robust, computer-designed chassis to allow for minimal servicing.

Metric Engineering Solutions
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SPONSORED CONTENT

Force measurement for efficiency in food processing and packaging

When we think about force measurement and its relation to product development, we often consider the aerospace, automotive or industrial industry; however, Interface have provided sensors for industrial automation solutions to thousands of customers using in-stock as well as custom application-specific sensors for OEM equipment to the food processing and packaging industries for many years. Many of Interface's customers use load cells and torque transducers to test and develop machinery used in the consumer packaging industry.

Interface are manufacturers of a full range of load cells providing the food processing and packaging industry with sensor technologies that increase efficiency and reduce waste. Like many industrial facilities, organisations are pushing hard to integrate new technology and automation that makes processes faster, more adaptable, and smart.

One of the factors critical to creating a smarter factory is by utilising force measurement sensors designed for collecting data in each production phase, as well as monitoring equipment in use for performance optimisation.

If you have ever wondered how a pill, a piece of candy or a can of food gets a little logo stamped on it without crushing it or how every bag of chips is nearly filled to the same capacity, chances are a load cell or torque transducer was involved.

Interface has a wide variety of precision-based accurate and reliable sensors used for various applications in food processing and packaging. Our customers are using miniature load cells within the production line to apply the exact force needed to delicately press a logo onto an edible product. We have others using multi-axis sensors from Interface to verify accuracy of intricately machined parts while moving through the manufacturing process.

Below are additional examples that highlight uses case of actual applications in food processing and packaging. Additional industrial application highlights can be found in our solutions overview by clicking here.

Commercial food processing

A food processing plant wanted accurate results of their in-motion check weigher when food is weighed and processed while moving down the belt. A check weigher is an automated machine for checking the weight of packaged commodities. This included ensuring production line efficiency and food quality, real-time results of their food weighed, and a load cell that can endure the food industry's soiled environment.

Interface offered a solution using multiple SPI High-Capacity Platform Scale Load Cells that could be installed in the customer's equipment that is used through the production line where product is weighed on the conveyor. The SPI High-Capacity Platform Scale Load Cells delivers precise weighing data. When connected to the 920i Programmable Weight Indicator and Controller, the solution provides the customer real-time results of the weight of the food. The 920i Programmable Weight Indicator and Controller can also read up to four scale channels in real-time. The processing gains in efficiency were visualized and managed during the weighing process to optimize control and production.

Water bottle dispensing and weighing

A beverage bottle manufacturer wanted to dispense the right amount of fluid into their bottles, and then weigh their bottles to ensure it is at the labelled weight on their product packaging. This is both to minimise waste, but also to meet the standard requirements noted on the packaging. Interface suggested using the MBP Miniature Beam Load Cell, and attaching it under a plate or platform the water bottle is placed on while it is being filled with fluids. The force weight is measured by the MBP Miniature Beam Load Cell, and connected to the 9870 High-Speed High-Performance TEDS Ready Indicator where results are captured, displayed, and recorded by the customer utilising their water bottle assembly machinery. With this solution, the water bottle manufacturer received highly accurate results of each water bottle weighed in real-time, using the accuracy to reduce waste and speed processing time.

Snack weighing and packaging machine

A snack manufacturing brand wanted to weigh the amount of consumable food product automatically dispersed into the bags during the packaging process. In this case, they needed to weigh their potato chips packaged and ensure the potato chips are at the exact weight needed due to regulatory standards. Interface's solution was to use multiple SPI Platform Scale Load Cells and install it to the potato multi-head weigher and packaging machine. The SPI Platform Scale Load cells were installed inside of the mount that attaches the head weigher to the packaging machine. Force results from the potato chips bag fill are read by the load cells and sent to the ISG Isolated DIN Rail Mount Signal Conditioner, where the customer was able to control the automated production from their command center.

The customer was able to determine the weight of the potato chips distributed into their bags with highly accurate results. They also were able to control the automated production process with the provided instrumentation. They will use this same weighing method for other snacks that need packaging utilizing the same sensor solutions.

To learn more about Interface solutions designed for the modern factory, or specifically the food and beverage industry, contact our expert application engineers at AMS Instrumentation & Calibration Pty Ltd.

AMS

Interface - AMS Instrumentation & Calibration (ams-ic.com.au)
www.ams-ic.com.au/services/ancillary/interface/

CASE STUDY

Lifting capacity for confectionery supplier

Founded in 1985, Kingsway Confectionery is a supplier of wholesale and retail confectionery products and a co-packing partner for branded and private label products in the confectionery and snack food industries.

The company was acquired in 2004 by Phil Wicks and his son Ray Wicks, who relocated to its current premises in Melbourne's bayside suburb of Seaford in 2016. This move facilitated the immediate expansion of the operation and provided the necessary scope for further growth opportunities. In 2020, the need for additional capacity became apparent and the installation of its third production line was commissioned.

Kingsway Confectionery's association with Enmin commenced 15 years ago when a top cross feeder was installed to an existing production line. This was rapidly followed by an order for a hopper feeder to further modernise the line.

"We reached out to Enmin in January 2021 to support us with the development of the supplementary equipment specifications required in what was going to be a joint build with tna, our manufacturer of choice for our form fill and seal packing machines," said General Manager Ray Wicks.

"In machinery and equipment, quality and reliability are paramount and Enmin brought this to the table in spades. We do strive to support Australian manufacturing and with them being a Melbourne-based manufacturer this was just an incredible bonus for us," Ray said.

"In the new retail landscape, 'just in time planning' usually means it is late, so we must have confidence that our machinery will keep us ahead of the curve. With Enmin it's a considerable advantage knowing that if something does not go to plan then the expertise to fix it is close at hand."

All Enmin equipment is fully constructed using the highest quality 304 stainless steel, providing good durability and reliability. The new line consists of an accumulation conveyer, a modular incline conveyor (Mi-CON), a hopper feeder and cross feeder feeding into a multihead weigher. Due to the nature of the business the lines are run with numerous changeovers, necessitating frequent cleaning protocols. The Mi-CON is suitable for the application given it's a hygienically designed, full washdown modular conveyor.

The other key benefit of the Mi-CON is that its multiple standardised components eliminate equipment redundancy. It can be added to, extended and modified in the years ahead as a company's production needs evolve.

"Enmin really impressed us with their project management expertise, outstanding service level and a can-do attitude that was evident throughout the entire build and installation process. Even the fine tuning that is always required with any new installation was done with minimum disruption.

"This installation was crucial and extremely time-sensitive to our business and any delay would have created significant issues. For them to have got our new line up and running on time and on budget in the middle of the COVID lockdown last year is testament to their abilities," Ray concluded.

Enmin Pty Ltd
www.enmin.com.au

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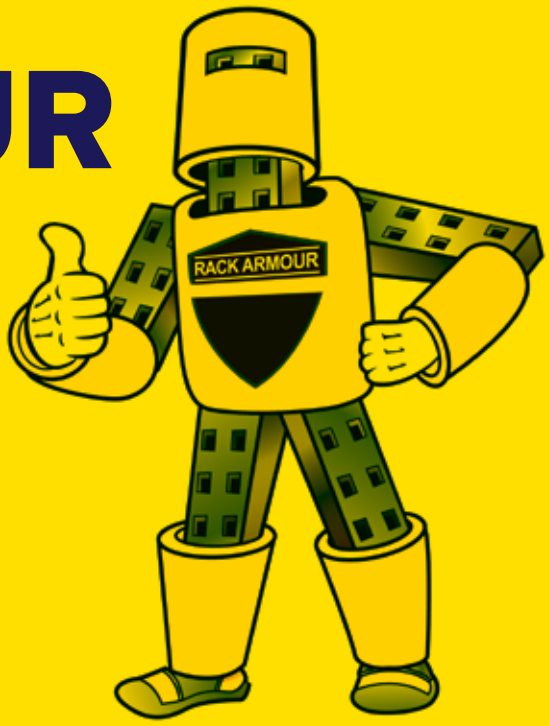

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AUSTRALIAN MADE AND OWNED

Mobile sanitary IBC unloading–conveying system

A new Flexicon Mobile Sanitary IBC Unloading and Conveying System transfers contamination-sensitive bulk solid materials from Intermediate Bulk Containers (IBCs) to downstream processes, dust-free.

The discharger frame is mounted on castors for in-plant mobility, while a hinged sub-frame supporting a surge hopper, flexible screw conveyor and support mast, can pivot down for manoeuvring through doorways and low-headroom areas.

The IBC frame is forklifted onto receiving cups, which position the IBC outlet onto the surge hopper inlet. Material flowing from the IBC into the charging adapter of a flexible screw conveyor is propelled at an incline, and discharged into elevated process equipment and storage vessels.

The conveyor handles a broad range of free- and non-free-flowing bulk solids ranging from pellets to sub-micron powders with no separation of blended products. The flexible screw is the only moving part contacting material, and is driven by an electric motor positioned beyond the discharge point, preventing material contact with seals.

Ready to plug in and run, the mobile unit can serve multiple functions throughout the plant. It can be rolled to a cleaning station where a lower clean-out cap on the conveyor tube can be removed to flush the smooth interior surfaces with steam, water or cleaning solutions, or to fully remove the flexible screw for cleaning and inspection.

The system is available in carbon steel with durable industrial coating, with stainless steel material contact surfaces, or in all-stainless steel finished to industrial, food, dairy or pharmaceutical standards.

Flexicon Corporation (Aust) Pty Ltd

www.flexicon.com.au

Automatic bag slitter

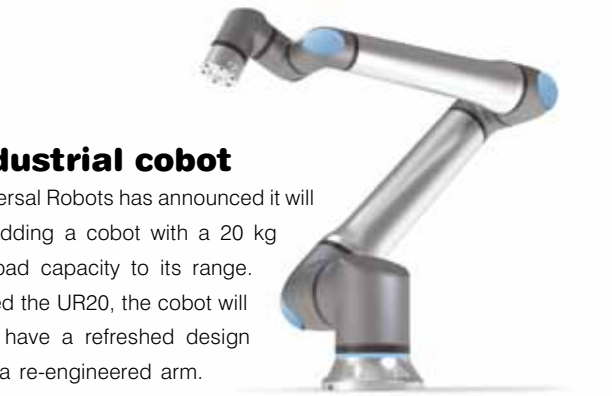
The Luxme MINILux automatic bag slitter is an automated food-grade bag slitter with self-contained dust collection and recovery. Capable of opening six 25 kg bags per minute, it provides conveying, slitting, emptying, integrated dust filtering and an empty bag compaction solution all in one machine.

The machine is designed to reduce the risk of explosion by containing all dust particles within the system itself, meaning work-space air remains clean, safe and hygienic. The use of the integrated filtration measures can also result in fewer instances of cross-contamination, meaning that a separate ventilation system may not be necessary.

A combination of bag sizes and weights are able to be processed automatically without adjusting or retooling the machinery, while panels on each side of the product enable ease of access for cleaning.

Luxme International

https:///luxme.com/



Industrial cobot

Universal Robots has announced it will be adding a cobot with a 20 kg payload capacity to its range. Called the UR20, the cobot will also have a refreshed design and a re-engineered arm.

Features include a redesigned joint that will allow for fast cycle times as well as the ability to handle heavier loads. It has a 1750 mm reach designed to work to the full height of the standard Euro-pallet and a small footprint.

The cobot uses the same user interface as previously used by the company but software enhancements provide users with more motion control capabilities.

In addition to palletising, the cobot is designed to be suitable for welding, material-handling, machine-loading and machine-tending applications.

Pre-orders are expected to open in late Q4 2022.

Universal Robots

www.universal-robots.com

CASE STUDY

From farm to shop: bringing IoT to the supply chain

One of Israel's largest supermarkets, Shufersal, has begun to utilise small devices that allow it to carefully and dutifully keep track of its produce in order to maintain its freshness while reducing waste. To achieve this, it turned to Internet of Things specialist Wiliot.

The partnership follows a successful trial of a system in 2021 where crates were affixed with the small trackers that send data to servers for analysis.

The system now put in place uses two pieces of technology from Wiliot: its Pixel stickers, which are small tracking devices that can be attached to boxes or crates to collect data, and its cloud platform that communicates with the devices. The Pixels do not require batteries as they are powered through the harvesting of radio frequency energy and can track information such as temperature, motion, location and whether the devices have been tampered with. The data collected is sent back to the cloud platform so that analysis can be performed. Over a million of the supermarket's crates will be tracked with the technology, which provides real-time location and temperature information.

The result is that Shufersal can keep track of crates of fresh produce, from the farm where it is picked to the store where it is sold. This means it can optimise shipping and storage to increase efficiency of its operations, including making sure that vegetables that are closer to expiry can be quickly put on store shelves.

"Being able to see in real time that produce shipments were kept at the right temperature and knowing exactly how many days passed from when it was picked to when it arrived in stores has been eye-opening," said Zvika Fishheimer, Shufersal's Executive Vice President.

"Shufersal is committed to offering our customers the highest quality and our ability to trace produce through our supply chain means we and our farmers can take every step necessary to deliver the freshest food in the market."

The result of the system is that inefficiencies can be located and reduced, while fresher food is provided to consumers, all while waste is reduced.

Wiliot
www.wiliot.com

Heavy duty threaded line vac

EXAIR's 76 mm Heavy Duty Threaded Line Vac is an in-line conveyor that can transport high volumes of material through ordinary pipe. Designed for rugged, industrial applications, it is made of a hardened alloy to prevent premature wear when transporting abrasive or heavy materials like garnet, glass, sand, shot blast, tumbling media or metal fittings. The unit features large throat diameters that make it possible to convey more material over long vertical and horizontal lengths.

The conveyors eject a small amount of compressed air through directed nozzles to produce a vacuum on one end and high output flows on the other with a fast response. Utilising a pressure regulator, the conveyance rate can be finely tuned to suit customer needs. There are no moving parts to wear out and no electricity is required.

Seven sizes from 19 to 76 mm fit standard pipe and coupling sizes. Additional models made from aluminium, 303SS and 316SS are also available in 11 sizes, with or without threads. Sanitary flange models from 38 to 76 mm are also available. The products are CE compliant and meet OSHA pressure requirements.

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Bag handling suction cup

Bags made of thin plastic film such as those used for salad leaves and fresh herbs, or the aluminium foil bags used for crisps and other snacks are flimsy and often just as fragile as their contents. New biodegradable and recyclable materials are becoming increasingly popular, and with this the challenges of bag handling increase.

Piab's BGX bag handling suction cup has been developed to deal with the challenges of flimsy, thin and oversized bags. The lip of the bag cup is designed with good sealing capability even at low vacuum level.

Produced as a one-piece suction cup with two bellows, the suction cup can pick bags of different heights with a safe and stable hold of the product in the fast/semi-fast robot applications. It is configurable for applications in e-commerce, FMCG, secondary food picking, fashion and other industries.

The suction cup is made of FDA- and EU-approved blue silicone for direct contact with food and is suitable for both high and low temperature applications. It can be configured by choosing between three sizes of the lip diameters 34, 41 and 48 mm, and six different aluminium push-in fittings designed to attach safely to the robust neck of the cups.

Pneumatic Products

www.pneumatics.com.au

Smart camera and lighting unit

Different materials and process environments put high requirements on the optical quality control of products and packaging.

The SmartSpect/eLED from Laetus uses one single calibrated system for both lighting and image processing for inspection, which allows a fast integration as there is no need to configure separate hardware and software components. When used in different lines, the results can be directly compared and the parameters optimised. Also, camera and lighting do not need to be synchronised again for format changes, which can save time. The combined compact design allows for significant space savings. All applications are programmed, eliminating the need for an external control device.

The unit is designed for a range of applications in industries like pharmaceuticals, medical technology, cosmetics, food and FMCG. The combined camera-lighting system checks the packaging content for completeness, verifies barcodes and 2D codes, and is able to read poorly printed or deformed codings by means of text recognition. The system can also recognise labels printed with UV ink. All applications are programmed, eliminating the need for an external control device.

Laetus

www.laetus.com/en/contact

Auto diverter for vibratory conveyors

Key Technology, a member of the Duravant family of operating companies, has improved its Auto Diverter for its Iso-Flo vibratory conveyors.

Designed for bulk product and packaging distribution lines, the diverter can split the product flow into two downstream systems and change the proportion of product going into each of the two lanes as needed.

Features include a stronger thicker diverter blade that can be easily removed for cleaning and maintenance, and an improved pneumatic hold-down system which anchors the blade to the surface of the bed to withstand a greater amount of product force without shifting from its programmed position.

Suitable for dry, frozen and wet applications, the diverter can handle virtually any free-flowing food product including fruits and vegetables such as cut and whole potatoes and cut and whole corn, as well as nuts, sweets, snacks and more.

With fully integrated and optimised controls, it can be operated locally at the user interface. Additionally, it can be programmed to be controlled via a plant-wide network and/or automatically controlled by downstream equipment.

Other features include scalloped welds throughout its stainless-steel frame and blade to maximise sanitation, and the actuator is positioned underneath the conveyor bed to help maintain food safety.

Available for beds up to 1830 mm wide, the diverter can be equipped with a blade up to 1200 mm long.

Key Technology Australia Pty Ltd

www.key.net

CASE STUDY

Fonterra upgrades warehouse automation using AGVs

New Zealand dairy cooperative Fonterra is set to improve its warehouse efficiency through the use of automated guided vehicles (AGVs) from Dematic. The AGVs will transport and feed pallets of raw materials into production subsystems as well as handle finished outbound pallets.

The AGVs feature Dematic software that is designed to improve useability and will allow Fonterra to better manage operations throughout the facility. They can help production flow smoothly by preventing bottlenecks without the need for manual handling.

They work as a driverless fully automated forklift — each with a load capacity of 3500 kg and a lift height of 4 m. The vehicles have data uploaded to them daily to define how they should work or which tasks need to be complete. They can also automatically return to charging plates when they're not required to be working.

"Our AGV systems are tailor-designed to navigate any production and warehouse space with a laser-guidance system, using onboard hazard detection to avoid collisions. This high-end navigation allows them to move around a facility optimally and safely," said Tony Raggio, General Manager of Sales, Mobile Automation, Dematic.

"Rotating laser scanners mounted on top of the AGVs measure angles and distances to reflectors mounted on the surrounding walls within the facility. The AGVs then calculate a position based on this information, together with speed and steer encoders to operate with a repeatable accuracy of ±5 mm."

The AGVs will be operating out of Fonterra's Edendale manufacturing facility and will manage a trio of activities: transferring and dispensing replenished consumables, stacking and de-stacking empty and pre-filled product pallets, and stacking and transferring finished goods to storage areas and conveyors prior to shipping.

Dematic Pty Ltd
www.dematic.com.au

Fat alternative using nanoparticle technology

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A team of researchers from the University of Connecticut, Yangtze University and Hainan University is using an emulsification technique to mix oil and water to produce shelf-stable healthy fats for food manufacturing.

The technique relies on the principle of high internal phase Pickering emulsions (or HIPEs), where "high internal phase" refers to a mixture with at least 75% oil; Pickering emulsions are stabilised with solid particles. So, in short, the principle relies on very oily emulsions that use solid particles to stop the oil and water from separating.

It's hoped that the HIPEs could be used as a healthy alternative to trans and saturated fats by food processors. The trans and saturated fats are commonly used to increase flavour and product shelf lives but that can be unhealthy. Healthy alternative fats, such as olive, avocado and sunflower oils, do exist but unfortunately lack the physical properties of trans and saturated fats, such as being solid at room temperature — which is where HIPEs come into play.

The researchers are working on emulsifying oils using water and nanoparticles into edible gels that could then be used in food manufacturing. The nanoparticles are being sourced from egg yolks, and soy and milk proteins. Once the oils have been combined with the water and nanoparticles, they are solid at room temperature and can be used in place of saturated fats.

"The cool thing is we have food-grade, edible nanoparticles in this system," said Yangchao Luo, one of the researchers working on the project. "We are trying to extract and purify those nanoparticles from the food and then reuse them in this type of emulsion structure so they can provide maximised nutrition benefits and also food quality to the consumers."

The researchers have worked to figure out the correct balance of oils and nanoparticles to prevent an odd texture. They also recently published a study to determine the appropriate cooking temperature and pH to use the emulsifications. The solid oil mixtures can be cooked at a temperature of 80°C and a pH of four to five is best.

"If you have too much oil there, the gel may be very rigid and hard for chewing," Luo said. "But if there's too little, it may be quite flowable, so it doesn't mimic the solid fat texture."

Oxidation has also proved problematic, but it was found that the addition of antioxidants like vitamins E and C would help to reduce it. Oxidation leads to rancidification of the oils, which leaves them with an unpleasant and acrid flavour that's unsuitable for food processing.

The researchers are working to make the HIPE gels shelf-stable, including being able to be frozen and thawed, and they want to make sure that sodium in food products doesn't destabilise the emulsions. 3D printers are also being considered as a way of adding extra nutrients to the HIPEs.

"We're hoping in the near future we can really make this by 3D printing and putting different nutrients together so we can personalise this product for different populations," Luo said.

The full study was published in *Food Hydrocolloids*.

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Desserts
that can compute their own flavours

A basic Logic Bonbon is filled with two flavours.

An interesting new research project from Monash University is creating a 'cyber' food experience that combines logic operations — the basic building blocks of every digital computer — with edible materials, resulting in the creation of a liquid-centred dessert.

The Logic Bonbon system includes a pre-made hollow bonbon with the option of three different 'logic gates' that allow the flow of flavoured liquids into the bonbon.

Users can introduce different liquids into the bonbon simultaneously and the bonbon is filled with different flavour and colour combinations depending on which 'logic gate' was used. The Bonbon also has a transparent top layer which allows the users to see their final results.

Food designer turned human-computer interaction researcher, lead author Jialin Deng, from the Faculty of Information Technology's Exertion Games Lab, said the idea behind the development of the Logic Bonbon was to use food itself as an integral part of the computational operation.

"Over the course of three months, we tested the system with 10 participants, allowing them to sense, experiment and 'play' with the Logic Bonbons, filling it with different flavour combinations which they could consume," Deng said.

"Through their interactions with the Logic Bonbons, the participants tangibly experience and learn about logic operations and are essentially creating a mini edible computer that requires an input, performs computation and results in different combinations of outputs while displaying different emoticons and flavours, allowing to the user to experience what computation 'tastes' like."

Co-author of the research, Exertions Games Lab Director Professor Florian 'Floyd' Mueller said the process of interacting with and understanding computation need not be restricted to linear methods.

"Through this project we are illustrating that even food materials and interacting with your meal can be a medium to introduce people to concepts of computer science," Mueller said.

"It would be great to see this research applied and developed further by creators like chefs, food designers and gastronomists to introduce computational concepts in a fun multisensory way and deliver experiences where diners 'execute' the 'software' that the chef has programmed into their food."

Possible future research building on this project will include developing more complex computational systems made of food to further explore how hospitality can be supported in delivering unique experiences to diners while supporting the chef's craft and expertise.

The Logic Bonbon research findings were presented during the ACM CHI Conference on Human Factors in Computing Systems in New Orleans, USA.

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NEWS

Oterra acquires Akay Group

Natural colour supplier Oterra has acquired Akay Group, an Indian company that produces natural colours and nutraceutical ingredients.

The Kerala-based company employs 400 people and has four manufacturing sites in southern India. Akay and Oterra have had a long relationship, previously operating in joint partnership until the mid-2000s.

"We're very happy to join the Oterra family," said Dr Balu Maliakel, Managing Director, Akay. "We have a fond shared history that has left a significant imprint on our business understanding and culture, and we share many of the same values. I am very confident that Oterra's innovative mindset will bring great value to Akay's customers. In many ways, this is like a homecoming for us."

Odd Erik Hansen, CEO, Oterra, said, "In recent years, Akay has successfully transitioned from a pure colours and flavours business to a leading science-backed botanical ingredients business. We both believe in bringing the best of nature to the world, and we're happy to welcome the team at Akay to Oterra. We look forward to working together to serve our customers in the future."

Culture range for plant-based meat alternatives

After launching its VEGA Culture Kit for dairy alternatives in 2021, Chr. Hansen is stepping into the meat alternatives arena with the VEGA SAFEPRO range — designed to help keep plant-based alternative proteins safe and fresh for longer.

The range consists of three cultures that can be applied alone or in combination to undergo fermentation, which helps stem the growth of yeast, mould and contaminants such as listeria.

Benefits include: helps to control the growth of unwanted lactic acid bacteria strains, pathogens, yeast and moulds; meets consumer demand for products with natural ingredients, potentially reducing overall sodium content in plant-based meat alternatives; contributes to a clean and fresh taste throughout shelf life; enhances the sustainability profile of food brands by reducing food waste.

The range is suitable for plant-based chicken strips or in cooked, ready-to-eat products.

Chr. Hansen

www.chr-hansen.com

Recyclable materials for frozen food segment

Walki is introducing a range of different materials, including printed solutions, to suit the needs of the frozen food market with the aim of making the packaging fully recyclable in the paper stream.

WalkiEVO Seal and WalkiOpti Seal are recyclable paper-based packaging suitable for pillow pouches for frozen food. WalkiEVO Seal has a dispersion coating as a barrier against water vapour and grease while WalkiOpti Seal has an optimised PE-extrusion coating. Both are suitable for all kinds of frozen food such as vegetables, seafood and bakery products.

Lamibel MDO-PE is a film-based material for pillow pouches made of reverse printed MDO-film and solvent-free laminated with low-sealing LDPE. Thanks to the MDO technology, the film thickness is minimised while performance is maximised by replacing other sorts of materials such as PP- or PET-films. It is suitable for all types of packaging (doypack, flowpack, pouches, etc) as well as all kinds of frozen food like vegetables, sharp-edges seafood and bakery.

WalkiPack Tray is a board-based tray suitable for frozen ready-made meals, designed to replace aluminium, plastic or plastic-coated trays. The tray material is 100% PET-free and recyclable in the paper stream.

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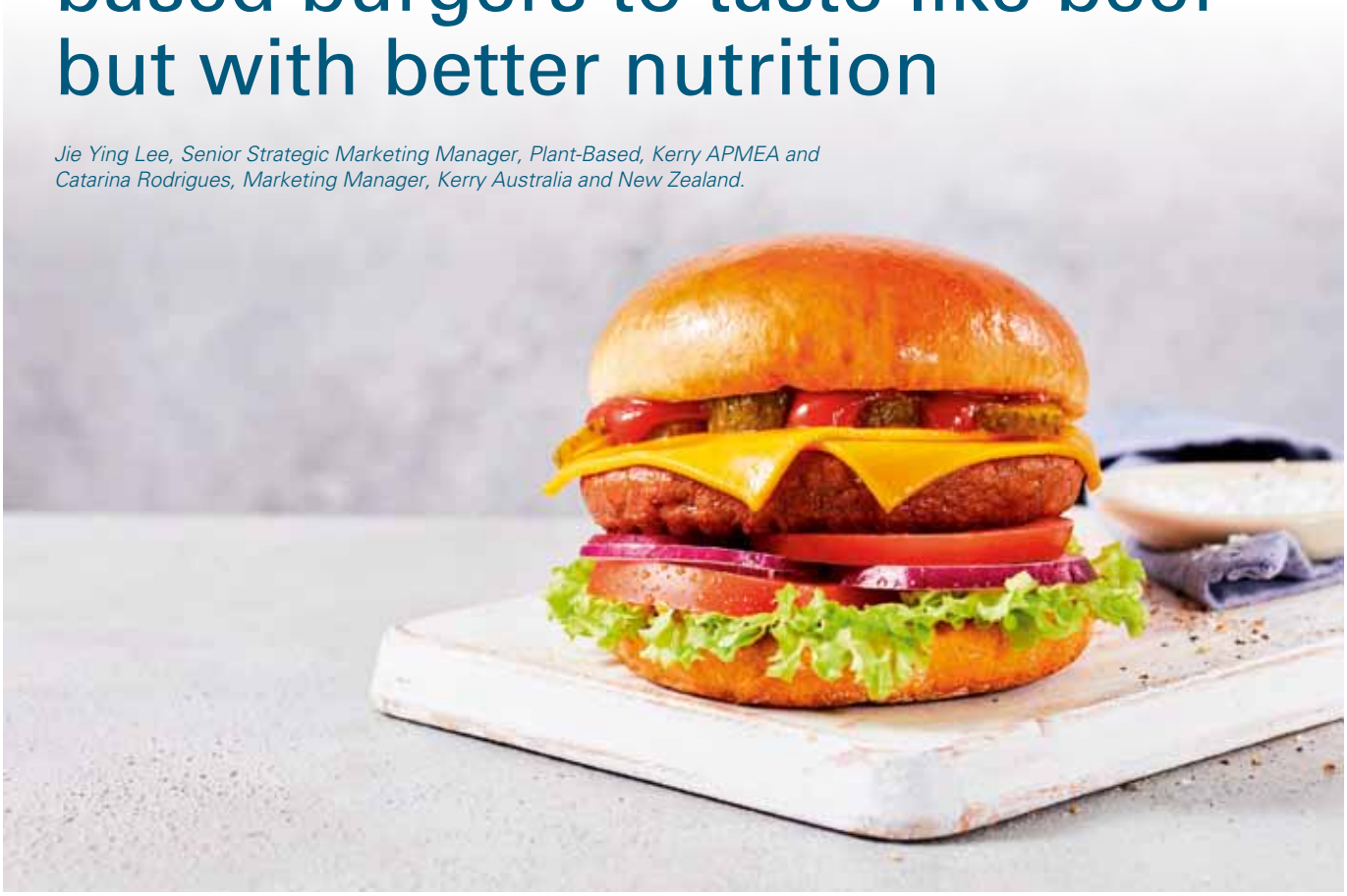
Creating a world of opportunity

Australian consumers want plant-based burgers to taste like beef but with better nutrition

Jie Ying Lee, Senior Strategic Marketing Manager, Plant-Based, Kerry APMEA and Catarina Rodrigues, Marketing Manager, Kerry Australia and New Zealand.



Research shows that Australia is the third fastest-growing market in the world for plant-based foods, and the local plant-based market is expected to reach A$3B by 2030.

Among Australian consumers, 55% are intending to eat more plant-based foods. Over in New Zealand, more than a third of consumers say they are eating less meat or none at all. People associate eating less meat and a wholesome, balanced diet with a longer, healthier life. In fact, 72% of Australian consumers believe a flexible diet that includes meat alternatives gives them more options to meet their health goals.

But while taste is the #1 reason people choose plant-based foods, 43% of Australian consumers say current offerings lack the taste and texture of meat, although 50% agree that food labelled as "plant-based" can be described as delicious.

All this shows that the plant-based market is dynamic and continues to evolve, with the region presenting an incredible opportunity for innovative, great tasting plant-based foods.

In Australia, the growing demand for innovation in plant-based burgers is fueled by flexitarians. As they consume both meat and meat alternatives, flexitarians are unwilling to compromise on flavour and expect plant-based products to deliver authenticity, and will not accept anything that tastes artificial.

According to Kerry's latest research with over 1,500 consumers across four countries — US, UK, Australia and Brazil — to uncover sensory expectations around plant-based burgers, and cheese alternative slices (US and UK), Australians use beef burgers as the benchmark — they want something that can replicate the taste experience of a burger grilled on a BBQ or eaten in a restaurant. They also have higher taste expectations. For example, while bitter plant-based notes were rejected by all the markets researched, Australians were the most sensitive and least accepting of it and other artificial notes.

Succeeding in the plant-based burger space in Australia requires finding the right balance of sensory attributes that will capture consumer interest and elevate their taste experience. According to the study, Australians ranked texture as the most important. This is followed by flavour and aftertaste, cooking and cooked appearance, raw appearance, cooked aroma, and lastly, feel.

Meaty firmness, Great Texture

For Australians, flavour alone is not enough to achieve the ideal plant-based burger taste experience. Texture is the top priority, with 74% of Australian consumers expecting a burger with a meaty firmness to have great texture.

Their decision making is influenced by what they can feel in a bite. Kerry's analysis shows that their texture journey begins from the moment they sink their teeth into the patty and break through the outer crisp, to the resistance they feel with each bite, how the patty is broken down to smaller pieces, how the oil and moisture are released, all the way to the clean after feel in their mouth.

As a result, they are looking for products with a firm outer (a result of charring) and a soft, succulent inner, which 70% of Australian consumers categorised as 'caramelised on the outside and juicy on the inside'. However, it is a delicate balance as they are not in favour of plant-based burgers that are too crispy on the outside and too soft in the middle, as this suggests poor quality. The challenge and opportunity for manufacturers is to achieve a good variation in bite that can deliver both crisp and succulence.

A good balance of savoury and meaty

Consumers in Australia are looking for plant-based burgers that can replicate the charred, caramelised notes and savoury taste of a real beef burger, with 70% saying they are likely to buy a plant-based burger with 'authentic chargrilled burger' descriptions. Products with these descriptions are also perceived to be better with 76% of Australians saying they believe it to be delicious.

With beef burgers as their benchmark, it's no surprise that plant-based products that can deliver on depth and complexity of flavour with a good balance between savoury and meaty do well in Australia. Consumers are looking for multiple notes in each bite, from meaty, slightly smoky, with subtle saltiness, slight pepper, and subtle herb notes, and cooked fat.

While Australians like complexity, they also prefer flavours to be natural with no synthetic or artificial notes. They find the bitterness, 'cardboardness' and beaniness usually present in plant-based products unappealing and also consider the chemical notes created from excessive masking a turn off.

Too much flavour can also put Australian consumers off as many products in the market overcompensate with added salt or sodium, resulting in a lingering after taste.

Visual and Sensory Appeal

Across all the four markets polled, overcooking is a common problem which leads to a poor eating experience. In Australia, in particular, the cooking process has a significant impact on the consumer's overall satisfaction as it not only gives them visual cues as to when their food is cooked and safe to eat, it also adds an emotional element of excitement and anticipation.

The consumer journey begins even before they get to cooking. Australians prefer to have the pink tone of the raw meat to be muted and natural — they don't want to see the visible fat globules and pink juices that mimic the bleeding in typical meat, citing it as 'going too far' in terms of replicating the overall meat experience.

Seeing the colour change from red to brown, and brown to charred or caramelised is the home run as it creates a perception that rich, deep flavours are developing. On the flip side, Australians do not like seeing visual cues that relate to overcooking such as the product burning, sticking to the pan and falling apart.

In addition, the Kerry study found that sensory cues, such as the aroma and sizzle sound that cooking produces, also help to enhance the cooking experience; 62% of consumers say increasing intensity of the aroma until it reaches meaty or smoky and the satisfying sizzle sound of a patty being cooked add to the drama in the pan, creating a positive expectation that the burger will be delicious.

KERRY

www.kerrygroup.com

CASE STUDY

‘Berry-good’ resealable packaging with tamper-evident seal

New Zealand-based grower and supplier of fresh strawberries and raspberries Best Berries was searching for a packaging solution to match its requirements for supply to the New Zealand and overseas markets.

After an evaluation of its options, the company chose K-Reseal from global flexible packaging and lidding films supplier KM Packaging. The lidding film range can be repeatedly opened and resealed to the tray, and was a perfect match for all the requirements.

The NZ berry supplier required a fully printed reclose lidding film with macro ventilation holes for its APET 250 and 454 g punnets of strawberries. The punnets needed to have a tamper-evident seal from the point of packing through to the consumer first opening the pack.

The owner of Best Berries, Boman Zakari, said: “Our customers were interested in reclose lidding options. KM Packaging were able to provide the solution.”

The challenges

One of the challenges of this project was that Best Berries’ tray sealing machinery settings had no waste film allowance between each lid, on a four-across tooling layout.

Zakari said: “We were concerned about the tight tolerance on our sealing machine tool, but the team from KM advised on the settings and we had no issues.”

After the successful eye mark trial, KM supplied the fully-printed order and shipped it by a combination of air and sea to coincide with the start of the picking season.

Best Berries is now able to offer its customers the security of tamper evidence along with the convenience of easy opening and reclose lid.

A solution with good shelf appeal

The lidding film offers the added advantage of being a mono laminate PET, which matches the tray, ensuring that the whole pack is designed for recyclability.

Zakari said: “Our customers are happy with the packing innovation. And it really looks great. It has been an excellent experience working with KM. The team are very helpful and try their best to provide solutions to any problems.”

The K-Reseal range is compatible with most tray sealing machines and is suitable for chilled and ambient storage.

It seals to rPET, APET and CPET trays, and options include mono-material, antifog and high barrier.

The range can incorporate print designs for improved pack presentation and shelf appeal. It can also include macro holes, hot needle or laser perforation for advanced packaging solutions making it suitable for products that need to respire.

Applications include multiple market sectors: fresh produce; meat, poultry, and seafood; bakery and desserts; dairy and cheese; and plant-based protein.

KM Packaging Services Ltd
www.kmpackaging.com

Inductive sensor series

The Wenglor INTT Inductive Sensors for extreme temperature ranges from Treotham can detect metallic objects contactlessly at ambient temperatures of up to 250°C.

Suitable for the detection of baking trays in large bakeries, the sensors are designed to have a long service life of up to five years. If they need to be replaced due to mechanical damage, the series can be replaced in just one simple movement, even at high heat.

For dynamic applications in hot areas, system builders can now choose from flexible cables and simple push/pull connectors. The plug-in sensor heads are therefore easy to replace.

Another advantage is the expansion of the cable range, which now also includes an option for dynamic applications. Despite the high temperatures of up to 250°C, the new cables are flexible and therefore suitable for dynamic applications on lifting platforms or elevator systems with skid beams.

Other features include temperature range between –10 and +250°C and the large switching distances between 15 and 40 mm. The series can be parameterised via an IO-Link interface, and using the integrated weproTec technology, several sensors can be installed directly next to each other in the tightest of spaces without interfering with each other.

The sensors are used in particular in drying ovens in the automotive industry for precise positioning of skid beams. Inductive sensors are also suitable for extrusion of aluminium profiles, for the detection of goods carriers in the steel industry or, as mentioned earlier, for the detection of baking trays in large bakeries.

Treotham Automation Pty Ltd
www.treotham.com.au

Refrigerant dryer

BOGE has converted its DS-2 refrigerant dryer in the lower power range to refrigerant R 513A. This has lower global warming potential than the refrigerant previously used but is designed to not compromise on performance in any way. The result is an energy-efficient dryer series with a low CO_2 footprint.

In order to optimise the CO_2 footprint of its refrigerant dryers, BOGE will be using a new refrigerant from December. From now on, it will be using refrigerant R 513A instead of R134a for its DS-2 series in the power range up to 10 m³/min. This is claimed to reduce the GWP value (Global Warming Potential) by around 60%: from 1430 to 573. The CO_2 equivalent, ie, the impact the substance has on the climate compared to carbon dioxide, also decreases accordingly.

Another advantage of the DS-2 series is the refrigerant circuit is hermetically sealed. This means that the mandatory testing stipulated in F-Gas Regulation EU 517/2014 is not required.

Boge Compressors Ltd
www.boge.net.au

Integrated geared motor

The NORD DRIVESYSTEMS IE5+ synchronous motor energy-efficient drive system is suitable for the food industry and intralogistics. The high-efficiency IE5+ motor has now been integrated into a single-stage helical gear unit — thus further optimising system efficiency — and is also launched in the next size.

By installing the motor and the gear unit in one single housing, DuoDrive is lightweight and compact, coupled with very high power density. The DuoDrive geared motor features high system efficiency and a consistent version reduction paired with a smooth, unventilated and compact design. Elimination of many wearing parts results in lower maintenance. The new motor is now available in ventilated or smooth surface versions for powers from 1.1 to 4.0 kW with a continuous torque of 6.8 to 18.2 Nm.

DuoDrive is a NORD DRIVESYSTEMS integrated geared motor in hygienic washdown design where the IE5+ synchronous motor and the single-stage helical gear unit are installed in one single housing. As a system, the compact DuoDrive concept achieves a higher energy efficiency than the combination of IE5+ synchronous motor and NORDBLOC.1 bevel gear unit.

The first available DuoDrive size covers gear unit speed ratios of i = 3.24 to i = 16.2 and is designed for torque ranges of up to 80 Nm and speeds of up to 1000 min-1. As it is easy to clean, corrosion-resistant and washdown capable, DuoDrive is also suitable for use in hygiene-sensitive and harsh environments, and provides good system availability and lower cleaning costs through lower cleaning effort.

If required, the motors are provided with a smooth surface or the nsd tupH surface treatment. The IE5+ synchronous motors are available in two sizes with a smooth motor design suited for washdown applications in food and pharmaceutical industries.

In case of stringent requirements on surface and corrosion protection, nsd tupH surface treatment is the technology of choice. Thanks to a special method, the surface is made corrosion-resistant and harder and is claimed to make aluminium behave like stainless steel with regard to corrosion protection. This is not a coating, but a surface treatment that creates a protective layer which is permanently bonded to the substrate material so nothing can detach or flake off. The drives are easy to clean and largely resistant to acids and alkalis. It is even possible to use high-pressure cleaners or apply aggressive media. nsd tupH treatment is available for most of the aluminium products in the NORD modular drive system, and suitable for hygienically sensitive applications in the food sector.

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

CASE STUDY

Plate freezer for meat processing plant in Dubbo

MHM Automation has recently commissioned its 200th Milmeq plate freezer at Fletcher International Exports' sheep meat processing plant in Dubbo, NSW.

The project saw the installation of two new plate freezers at Fletcher International Exports' Dubbo plant, each standing at 12 m high, with a capacity of 2560 cartons and the ability to completely freeze cartons of cold boned product in less than 24 hours.

This installation brings the total number of Milmeq plate freezers installed for Fletcher International Exports across both its plants to 18, three of which feature the latest technology innovation, single station opening (SSO).

The SSO plate freezer model was a collaborative development between Milmeq (now part of MHM Automation) and Fletcher International Exports, with the first commercial prototype being commissioned at Fletcher's Dubbo processing site in 2015.

The SSO mechanism allows products to be automatically loaded and unloaded one station at a time, keeping the remaining stations closed and product in those stations in contact with the plates to continue the freezing process. The SSO is designed to increase the effective refrigeration, to ensure regulatory compliance.

The plate freezers are claimed to deliver savings of up to 30% over the blast freezing method traditionally used, and more than halve the time required to freeze cartons.

Cartons frozen in the plate freezers have flat presentation, allowing 10% more cartons to be stacked, which can reduce shipping costs.

Completely automated loading and unloading operation, with integrated infeed and outfeed conveyors, can reduce manual labour and associated WHS risks with working in a frozen environment.

MHM Automation
mhmautomation.com/

CASE STUDY

McCain plant to generate power through food waste

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McCain Foods' Ballarat processing plant will soon be using food waste to generate its own power. The plant will be introducing equipment that takes solid and liquid by-products from the manufacturing process and converts them into a renewable biogas for heat and electricity generation, in what the company is calling a closed-loop success story.

A cogeneration system is expected to reduce CO_2 emissions by about 15,100 tonnes per year and will save 23,000 tonnes of waste — that's around 1600 full garbage trucks.

"The electricity generated from this system is used to offset our reliance on the grid and the heat is used in our steam generation process to offset our reliance on natural gas," said McCain Engineering Project Manager CO_2 Reduction Scott White.

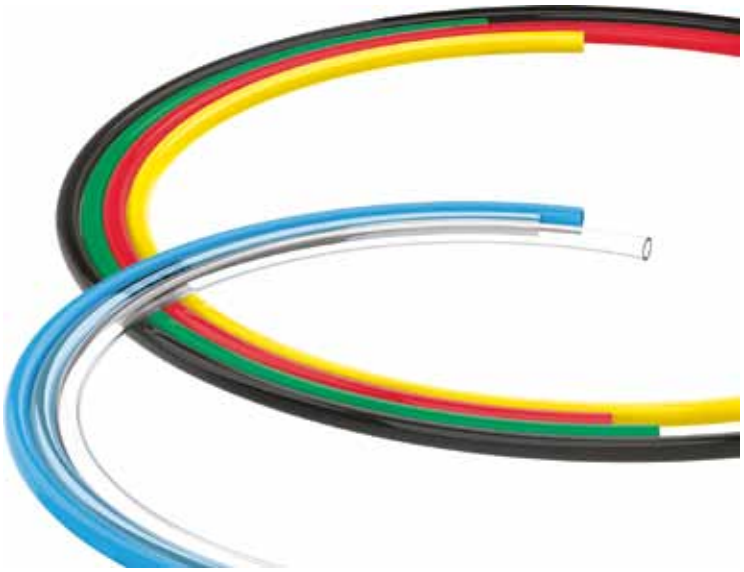
"The way we approach reducing our CO_2 emissions needs to be innovative, future-proof and work within a circular economy — and our team is leading the way to identify the best opportunities at each of our sites," White said.

The technology will produce 9,640,000 kWh of electricity and 78,593 GWh of gas annually, reducing McCain Foods Ballarat's reliance on the grid by 19%.

"This new approach also gives us the ability to optimise our total energy usage by being able to match the output of the system based on solar production, factory consumption and biogas generation."

In addition to introducing the cogeneration system, the plant will also be constructing a solar car park in 2023 that will reduce emissions by a further 12,100 tonnes and produce enough electricity to power 4500 homes. More than 1100 solar panels will serve the 8.2 MW system, which will provide shaded car spaces and power to two electric vehicle charging ports. Energy consumption from the grid is expected to be reduced by 20% through the solar panels.

McCain Foods (Aust) Pty Ltd
www.mccainfoodservice.com.au



Food-compliant tubing/fitting combination

The PUN-H-F tubing and NPQR stainless-steel push-in fitting product combination from Festo is designed to ensure compliance with food safety requirements for manufacturers of food and packaging machines.

The PUN-H-F food-compliant tubing meets the standards for use in the food industry according to Regulation (EC) 1935/2004 and FDA 21 CFR 177.2600. Together with the NPQR fittings, it can be used in the food and packaging industry, particularly in places where it might come into contact with food.

The kink-resistant tubing is resistant to hydrolysis and microbes, making it suitable for environments with high moisture or with water at temperatures up to 60°C. The material used prevents hydrolytically induced cracking. The black version is especially UV-resistant and thus also suitable for use outside of enclosed buildings. The 'natural' colour variant is suitable for applications with gaseous oxygen as the operating medium.

The push-in fitting also complies with Regulation (EC) 1935/2004 and the materials are listed to FDA 21 CFR. It is additionally certified to NSF 169.

The large number of variants, threads and tubing sizes makes it suitable for many different applications. Assembly is easy and works by simply plugging and unplugging the tubing. Leaks are prevented by a chambered O-ring that is securely held in place. The food-compliant design reduces edges where dirt could collect. This makes the push-in fitting easy to clean.

In applications where fittings are subjected to intense heat, the NPQH metal fitting can be used, which is also food-compliant, heat-resistant up to 150°C and suitable for high pressures.

Festo Pty Ltd

www.festo.com.au

Beef marbling
measurement tool gets accreditation tick

Australian Agtech startup MEQ Probe has received accreditation for its 'hot carcase' marbling measurement technology for beef, just three months after its lamb accreditation.

In February after stringent independent testing, the MEQ Probe technology was accredited by industry peak body AUS-MEAT, for accurate measurement between the 100–1200 MSA point range for beef. The technology has the ability to measure both intramuscular fat (IMF) in lamb and marbling in beef.

Marbling is considered one of the most significant aspects impacting the quality and value of meat. It refers to the small flecks of fat distributed throughout the muscle in beef and is currently measured using cold marbling measures where fat deposits and distribution on a cut surface of chilled beef is visually assessed by processing plant graders or grading professionals.

Current marbling measurement methods can present some inefficiencies, including: losing valuable time that could be used to create thorough cut design plans; using energy to chill carcases; losing space in chillers; and potential grading inaccuracies due to human error and subjective judgement.

MEQ Probe's newly accredited hot measure solution is designed to give processors 10x the time to determine their cut design plan and can help to save on energy and chiller space. The hot measure prevents the need for extended chilling, which can provide WHS improvements in the boning room. Information about individual carcase is also provided in real time, allowing processors to share insights quickly through the supply chain — distributors, retailers, consumers and farmers.

The solution works using spectral analysis on a carcase-by-carcase basis coupled with machine learning to provide meat processors with an objective real-time measure for meat quality.

The accreditation of the company's beef marbling probe comes after processors Australian Country Choice (ACC) and Teys Australia partnered with the company to help the development of the probe over the last 12 months.

MEQ Probe Beef Probe Gun.

MEQ Probe CEO Remo Carbone said Australia produces approximately 2.4 tonnes of beef a year, 76% of which is exported. "Our beef quality is a point of pride and with consumers becoming increasingly discerning when it comes to product quality, having an accurate, scientifically backed measure of meat marbling is critical. Our accreditation puts Australia at a distinct advantage and opens doors for what producers and processors can do in terms of branding and premium price targeting."

"We are beyond thrilled to have received accreditation from AUS-MEAT and to work with all those in the beef supply chain to make digitised marbling measurement the standard for the industry. However, MEQ Probe will continue to push the limits of our technology and work to bring even more value and understanding about the red meat we eat. We have a lot planned for 2022."

MEQ Probe
www.meqprobe.com

CASE STUDY

Increasing capacity at a craft brewery


Image credit: KHS / Tiny Rebel

Tiny Rebel uses a can seamer from Ferrum, one of KHS' partner companies.

Tiny Rebel, a British craft brewery from Newport in South Wales, has used KHS filling machinery to increase the efficiency and capacity of its canning operations thanks to KHS Innofill Can C can filler being installed.

According to the brewery, the new machine fills the same amount of beverage in an hour as the prior machine would have filled in a whole day. The team at Tiny Rebel now produce up to 15,000 330 mL cans an hour. The machine also lets the brewer control the level of oxygen in the beers, through its CO_2 purging process that provides a high level of precision for filling operations.

"Oxygen control is the key to good beer. The special CO_2 purging process on the Innofill Can C can cut oxygen pick-up by up to 90%. We attach great value to appropriate product quality, especially with our ales. With KHS, we can perfectly meet this requirement," said Mark Gammons, head of operations at Tiny Rebel.

The machinery has a compact design with good hygiene performance, which allows for smaller batches of different beer styles and container sizes to be produced without reducing product quality. Tiny Rebel produces a large range of products so this is an advantage as the machine can prevent contamination and flavour carryover on the frequent product changeovers.

"The help the KHS team gave us with this project was magnificent. From ordering through planning to commissioning, everything went really smoothly," Gammons said.

For beverage producers with a higher output, KHS recently upped the performance of the Innofill Can C to be able to manage up to 60,000 containers every 60 minutes. Thanks to this new series, the machine can now be integrated into lines with higher capacities more effectively and supplemented by an Innopro Paramix C blending system or a KHS flash pasteuriser, for example. Furthermore, the hot filling option increases flexibility when it comes to producing juices, iced teas and other beverages.

KHS Pacific Pty Ltd
www.khs.com

‘Moist incubation’ process step for fruitier dark chocolate

New methods of making chocolate continue to be explored in order to develop the latest taste sensations. Now, researchers reporting in ACS’ *Journal of Agricultural and Food Chemistry* have found that an alternative processing step called ‘moist incubation’ results in a fruitier, more flowery-tasting dark chocolate than the conventional fermentation process.

Making chocolate is a multistep process that begins with freshly harvested cocoa beans. After harvest, the beans are traditionally covered in banana leaves and left for a few days to ferment. During this time, microbes in the environment degrade the pulp surrounding the beans, heating and acidifying them. This causes biochemical changes in the beans that reduce bitterness and astringency,

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while developing the pleasing flavours and aromas associated with chocolate.

Recently, scientists developed an alternative, non-microbial approach called moist incubation, in which dried, unfermented cocoa nibs are rehydrated in an acidic solution, heated for 72 hours and then re-dried. The method, which is said to be faster and more easily controlled than fermentation, produced similar aromas in beans as fermentation, with some differences. Irene Chetschik, Ansgar Schlüter and colleagues wanted to find out how the taste and aroma of the final product — chocolate — compared when using moist incubation versus traditional fermentation.

The researchers made chocolate bars using moist incubated or fermented dried cocoa beans, as well as unfermented beans as a control. Sensory panellists said the moist incubated sample had higher intensities of fruity, flowery, malty and caramel-like aromas, whereas the fermented one had higher roasty aroma notes, and the bar made from unfermented beans had a primarily green aroma. The panellists rated the moist incubated sample as the sweetest-tasting, while the unfermented chocolate was the most bitter and astringent.

Identification of aroma compounds by gas chromatography (GC)-olfactometry and their subsequent quantitation by GC-mass spectrometry revealed higher levels of malty compounds called Strecker aldehydes and lower amounts of roasty compounds called pyrazines in the moist incubated chocolate compared with the fermented one.

The researchers concluded that moist incubation produces a chocolate with a pleasant aroma and taste and could, therefore, serve as an alternative postharvest treatment.

CASE STUDY

Pond treatment for protein rendering unit

Craig Mostyn Group is one of Australia's leading diversified food and agribusiness companies. Its protein rendering unit Talloman, a core division of the Craig Mostyn Group, started having issues with a treatment pond, so Plant Manager Carlos Mendes looked for a solution. He wanted a reduction in BOD, COD, NH_3 and blue/green algae.

Hydro Innovations recommended a Gorman-Rupp 100 mm EchoStorm system, which comprised a Gorman-Rupp U4A60S-B self-priming pump that powered a Gorman-Rupp EchoStorm VA4 venturi aerator.

The pump draws water from the lagoon, pumps it through the EchoStorm unit, drawing in air, mixes it with the water and delivers it back to the lagoon. The unit 'saturates' the water with dissolved oxygen, 'conditions' it and breaks down organic matter. This ruptures vacuoles within the blue/green algae, sinking it, depriving it of the sunlight required for growth.

The results

Mendes tracked the progress of the EchoStorm by measuring the total taxa. When the unit was installed in March, total taxa measured 217,000. Mendes stopped measuring when the last reading in May measured 6630 (a reduction of 97%).

Mendes and the Talloman team are happy with the results.

EchoStorm aerators are available in sizes from 2 through to 6″.

Hydro Innovations
www.hydroinnovations.com.au

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Innovator program for plant-based products

The PlantForm program has been launched to help new and existing companies market plant-based products. The program aims to help companies through the product development phase and provide scale to help get the products to market sooner.

Combining 25 years of expertise in bringing plant-based foods to market, the program will provide value-added capabilities in research and development, co-investment opportunities and connection to the food-tech production ecosystem.

The company will act as a conduit to help drive system change through food tech innovation, agile manufacturing and growth infrastructure to bring plant-based food products to market.

Drawing from experience in bringing over 1000 plant-based SKUs to market, PlantForm's system can develop pathways to scale, leveraging multiple APAC locations and access to resources and capital.

PlantForm's first round of partnership and manufacturing inquiries is open for application from April.

PlantForm
https://plantform.partners

SIL-2 rated flow switches

AMS Instrumentation & Calibration is offering the FLT93 series of flow switches from Fluid Components International.

The series provides an early warning alert for potential dry running conditions, cavitation and other pump issues that can lead to emergency shutdowns, service interruptions and unplanned costly maintenance.

The product has no moving parts and a dual alarm capability. The first alarm allows the switch to detect low flow conditions between 0.003 to 0.9 m/s. This can serve as a warning system for the control system or operator, giving them the option of halting the pump if necessary.

The second alarm occurs when the pump is running dry, signalling an emergency situation required a system shutdown. The alarm prevents expensive and permanent damage to the pump by allowing early operator intervention.

The product offers flow, temperature and level sensing in the one device. Its dual 6A relay outputs can be assigned to any of these measurements. It can be specified in either insertion or inline styles for pipe or tube installation.

The switch has been tested in multiple temperatures and pressures and operates at a maximum pressure of 162 bar and 260°C. It has received a number of agency approvals including SIL-2, FM, FMc, ATEX and IECEx.

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

Mobile compressed air container station

There are some situations where a mobile compressed air supply system solution is required. Here, container solutions can offer the same efficiency as a permanently installed station but in a lean and flexible model. Moreover, they are available in a vast range of configurations to meet compressed air requirements.

The Kaeser Contain-Air units provide a prefabricated container solution for compressed air supply. The ready-to-run solutions are particularly suitable when it comes to bridging short-term compressed air bottlenecks or as an option if a station needs to be converted or maintained, as they are also readily available on a rental basis at short notice.

The mobile and space-saving containers include a complete compressed air station that provides a quiet supply of quality compressed air when and wherever it is needed. Standard container dimensions ensure rapid and straightforward transportation of the plug-and-play stations.

Thanks to an easy-to-use connector panel for pipes and cables, the soundproofed container station can be put into immediate operation virtually anywhere and can be up and running quickly in the event of an operational emergency.

Kaeser Compressors Australia
au.kaeser.com

Custom air knives

EXAIR's Air Knives are suitable for blowoff, cooling, cleaning and drying in a myriad of manufacturing processes. To accommodate the wide variety of unique problems manufacturers face, EXAIR has the ability to customise and tailor air knives to different specifications. The air knife customisations can range from size, to shape, to material, custom mounting holes and dimensions. They are created to solve distinct manufacturing problems not already solved by the range.

For users with space limitations, smaller lengths or skinnier profiles can be created. In situations where the knife may need to be installed in a very defined spot, special mounting brackets or additional/custom sized air inlets can be provided to fit a current system. For applications where stock aluminium, stainless steel or PVDF won't work, other material options such as CPVC or glass-filled PEEK thermoplastic have been used. Special marking requirements for tying knives to specific machines or critical processes can be accommodated. Unique shapes and profiles, such as double-sided or curved air knives, can also be the solution to certain specialised processes.

Available in Super, Standard and Full-Flow styles, all air knife versions are able to be customised to a user's specific needs.

Compressed Air Australia Pty Ltd

www.caasafety.com.au

Salt reduction strategies

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A new scientific review has looked at a range of sodium reduction strategies that can be taken by food producers to reduce the amount of salt in foods.

Generally humans enjoy the taste of sodium — so much so that most people will easily (and accidentally) eat more than the recommended amount of it each day. Eating too much sodium can be associated with high blood pressure, hypertension and an increased risk of heart disease and stroke, and just three slices of bread is all it takes to reach the daily recommended amount.

Aubrey Dunteman and Soo-Yeun Lee, Department of Food Science and Human Nutrition at the University of Illinois Urbana-Champaign, conducted a comprehensive review of sodium reduction strategies in food production. The scoping review looked at the results of hundreds of scientific studies, literature reviews, book chapters and patents to analyse the different methods of reducing salt in foods. It focused on studies that included sensory data with human subjects, because palatability is essential for consumer acceptance.

"In this review, we looked at different food systems. The way you would reduce salt in a solid system, like a topical application on snack foods, such as salted peanuts or salted chips, would be very different from embedded application in semi-solid foods like cheese or bread. And in a liquid system like soup, where it is completely dissolved, it would be really different in the way we could reduce salt yet provide the palatability it gives," Lee stated.

"We're hoping this work will provide insight into the wide variety of salt-reducing technologies that exist. This can help food companies be more informed to use different strategies than what they have been doing," she added.

Five main strategies were identified in this process: salt reduction, salt replacers, flavour modification, physical modification and functional modification.

Some of these are fairly obvious, such as replacing salt with different ingredients or simply reducing the amount used, but the others are less straightforward for manufacturers.

It is not possible for manufacturers to simply remove salt from some products as it often serves as a functional ingredient, not just as a flavour booster. For instance, it is difficult to make bread or cured meats without the use of sodium, where it is needed for leavening or preservation.

Many studies used salt replacers such as potassium chloride, calcium chloride, or other chloride or acid salts. However, these substitutes tend to have a bitter taste, so they are often used in combination with flavour modifications, such as umami substances or bitter blockers.

"Another method is physical modification. For example, you can encapsulate the salt crystals, which changes how the salt is dissolved in the mouth. This can alter the saltiness perception allowing for a reduction in the amount of sodium necessary to create the salty taste. You can also create an uneven distribution of the salt in a product that can further help enhance the perceived saltiness of the food product through taste contrast," Dunteman explained.

"Finally, there is functional modification. For example, you could move away from a sodium-based preservative in cured meats, perhaps using a celery-powder preservative instead of sodium nitrate."

Functional modification is less represented in the scoping review because this type of sodium reduction research typically does not incorporate a sensory component as a main assessment method, Dunteman noted.

The findings were published in the *Comprehensive Reviews in Food Science and Food Safety* journal.

CASE STUDY

Driving a snack manufacturer's operations

Canadian snack food company Inno Foods has used Teflon-coated drives from Enmin to increase the flow rate of its manufacturing operations.

Producing 'free-from', organic and vegan snack food products, Inno Foods sells its food around the world. The company was encountering issues with its drives, which were struggling to obtain a satisfactory flow rate.

Inno turned to Australian manufacturer Enmin to provide new drives. The manufacturer is known for its electromagnetic drives that can control the flow of products, parts and bulk materials. The construction of the drives means that products are screened, sized or accurately metered to allow for a smooth, uniform and fully variable flow.

In Inno's case, Enmin's Teflon-coated drives were able to offer the food manufacturer high durability in the snack food company's washdown environment.

The Teflon is fully FDA approved; its 40 micron surface coating means that it does not suffer from the chipping that can occur on painted models, making it suitable for use on mobile equipment. The coating offers cathodic protection, which reduces surface rust and makes cleaning more efficient. Additionally, the Teflon coating is designed to offer increased longevity as well as low energy consumption.

Inno Foods has proceeded with the Teflon drive order and has stated that it may look at more orders in the future.

Enmin Pty Ltd
www.enmin.com.au

CASE STUDY

Racing to provide fresh, cold-pressed juice

Green Plant has provided beverages to crowds of visitors at a Formula 1 event in Miami thanks to its use of specialised equipment from Hiperbaric and Petainer that allowed it to sustainably pasteurise and serve cold-pressed juice.

Green Plant had been using Hiperbaric machinery — specifically the Hiperbaric 420 — to produce its cold-pressed juice using high pressure processing (HPP) and adopted new equipment from the high-pressure technology company to enable to it serve the revved-up crowds at the Miami Grand Prix. HPP is a technique that applies cold water and high pressure to packaged foods and drinks to destroy harmful pathogens without the use of preservatives or other chemicals. It also extends product shelf life and enhances taste and nutrition.

In order to reduce the amount of waste hundreds of small bottles of juice could produce, Green Power opted to use large, refillable kegs from Petainer that were designed to be processed through the Hiperbaric HPP machinery. These kegs were filled with enough fresh juice for crowds of people and they then underwent the HPP technique. The result was that large numbers of people were provided with cold-pressed, pasteurised juice but without the need for many individual bottles to be produced and processed.

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Additionally, the kegs themselves are made of recycled materials, and the HPP method uses only water and electricity, thus making the whole operation a more sustainable one.

"With this new acquisition, we continue to serve our Florida customers and hope to take on new customers and retail partners," said Federico Intriago, Green Plant owner.

Hiperbaric S.A.U.
www.hiperbaric.com

Plain bearings for hot environments

In bearing points in the food and packaging industries, temperatures and speeds are frequently high. Ensuring that mechanisms function reliably requires durable plain bearing solutions that can continuously handle friction and heat. The igus iglidur AX500 provides users with a wear-resistant tribo-polymer that is electrically dissipative and can be used at high temperatures. This makes it suitable for maintenance-free applications with food contact.

For example, dosing systems equipped with highly sensitive mechanisms can fill thousands of bags of gummy bears in no time. Slides and belts then move the sweets to a box. At these high speeds, all the packaging mechanisms, and especially their bearings, are subjected to wear. Plain bearings made of the new iglidur AX500 high-performance polymer from Treotham help make bearing points maintenance-free and durable. The material is electrostatically dissipative, ensuring that the bags do not stick to each other and do not cause electric shocks. In very dusty environments such as flour processing, sparks can also lead to dust explosions. These sparks can take the form of small arcs that occur when moving machine parts do not have an electrically dissipative design.

As the material is also suited to the high-temperature range, it can be used in applications such as ovens and bottle cleaning. Its good chemical resistance means that aggressive cleaning agents will not harm the bearing. Nor is there any problem if the bearing contacts food, as the tribologically optimised polymer, with its embedded solid lubricants, requires no additional lubrication. The material also complies with Regulation (EU) No. 10/2011. iglidur AX500 plain bearings are not only maintenance-free, unlike stainless steel bearings, but also weigh less than the latter.

iglidur AX500 is designed to achieve better wear results than the iglidur A500. Available in standard dimensions (6–20 mm diameters), with or without a flange, it can be also made in special dimensions.

Treotham Automation Pty Ltd

www.treotham.com.au

30% more
poultry-based foods from one chicken

Finnish food tech startup SuperGround has invented a food production technology that is claimed to enable up to 30% more poultry-based foods from one chicken compared to existing methods. This is achieved by harnessing the nutritional benefits of bones in an unnoticeable way.

The food production technology is designed to help the food industry offer commonly known food choices, such as chicken nuggets and meatballs, that are nutritious and reduce the burden on the environment by creating less waste.

According to estimates by the Food and Agriculture Organization (FAO), by 2050, we will need to produce 60% more food to feed a world population of 9.3 billion. But at the same time, 800 million people globally are undernourished.

"Our food production line technology enables the food industry to instantly produce well-known poultry-based foods more efficiently and sustainably, without major investment or an increase in production costs," said Tuomas Koskinen, Chairman of the Board of SuperGround and one of the investors in the company.

The SuperGround food production line provides a closed process where zero raw material is lost, reducing food waste.

The SuperGround team

How to crack the use of bones

For centuries, humans have used bones for dietary purposes, such as bone marrow soups. But previously, it has not been possible to use the nutrition and dietary aspect, such as high calcium content, of bone more broadly in food production.

Producing up to 30% more poultry-based food from one chicken is possible due to SuperGround's food production line technology. It uses an extrusion method enabling the use of bone in food production in a safe and non-visible way. The extrusion process can also be used for producing many vegan proteins. The company's first implementation of the technology is with poultry products.

"We evaluated and tested various food raw materials and then quickly settled on chicken. Chicken is among the most environmentally efficient grown terrestrial animals, consuming the least land and water resources. Around 35–40% of chicken net weight is bones after guts and feathers are removed, making it optimal for our process. Let's take a chicken nugget as an example. The nuggets look and taste the way consumers are used to but are more nutritious due to higher calcium content, and are produced more efficiently with less environmental impact. It is the same nugget, just better in numerous ways," said Santtu Vekkeli, CEO and Founder of SuperGround and inventor of the solution.

The company has previously gathered seed funding from angel investors for R&D purposes and now the food production line technology is ready.

The SuperGround team demonstrated the technology at IFFA 2022 in Frankfurt, Germany, in May.

Subscription-based condition monitor

The Alfa Laval CM Connect uses digitalisation to drive innovation and growth for users in the hygienic processing industries. The CM Connect is a subscription-based condition monitor and cloud gateway. It enables plant operators to access data of rotating equipment on processing lines from a remote location.

With data on actual runtime, trend analysis and time to next service close at hand, it allows plant operators to make informed maintenance decisions using their personal computers and mobile devices.

With complete visibility of all connected assets, plant operators can detect issues that impact future performance, prevent unplanned downtime and improve asset management.

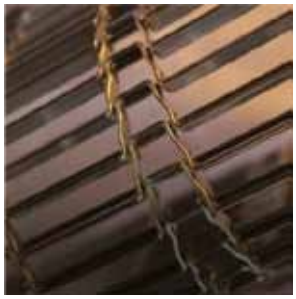
Acting as a gateway communicating via Bluetooth, the CM Connect can link up to 10 Alfa Laval CM wireless vibration monitors launched last year. It then transmits the data over a 4G cellular network to the cloud for review and analysis on an intuitive, user-friendly dashboard.

Advanced vibration analysis enables detection of any deviation from preset equipment threshold values. Should deviations occur, an SMS or email notifies users who can take action in real time based on data analysis.

It can also act as a sensor, measuring vibration, inboard temperature and total runtime when mounted on Alfa Laval LKH, SRU, SX and DuraCirc pumps, or other rotating machines, such as agitators or mixers.

Alfa Laval Pty Ltd
www.alfalaval.com.au

Conveyor belts



Regal Rexnord Corporation has launched three new products in the Rexnord KleanTop line — the PacTitan Pro Belt, a new series of Active Drive Spiral Belts and the 1600 Plastic Belt Series.

The PacTitan Pro is a robust, food-safe stainless steel metal belt designed to stand up to harsh applications like frying, battering and breading with a design that can extend the life of the belt for longer than average metal belts.

The new series of Active Drive Spiral Cage Belts is designed to be actively driven from the inside edge by the drum via canonical tips, reducing the risk of over-drive. Users can choose from three different belt styles to meet the needs of their application: grid-style, link-style and rod-only belts.

The Rexnord 1600 KleanTop Belt Series of food-safe plastic belts are designed for strength and stiffness and can be dropped in as a replacement part for most similar belts without switching out sprockets.

Regal Rexnord Australia
www.regalrexnord.com

What's new

Plant-based ready meals

v2food has launched a range of ready-made meals that are now available in Woolworths. The products come in four varieties: Spaghetti Bolognese, Lasagne, Penne Bake and Chilli Con Carne. The plant-based meals are designed to replicate the texture, taste and smell of eating these classic meals but without the use of any meat, and can be heated up in the microwave. **v2food.com**

Non-alcoholic craft beer

Sobah produces non-alcoholic craft brew using native Australian ingredients. Brewed on Queensland's Gold Coast, the beers use native plants to provide a range of flavours, such as pepperberry, wattleseed and finger lime. The products can be bought from select stockists around the country, and from the company's website or in bars and pubs. **sobah.com.au**

Immunity-boosting tea

Arkadia Beverages' Immunity Chai has been developed to help increase immunity during the cool winter months. Chai, ginger root and turmeric have been combined with black pepper to produce a tea with immune-boosting properties. The addition of vitamin C, zinc and iron is also intended as a way of boosting nutrition for the winter months. Plus, the tea has pre- and probiotics for gut health. With just 55 calories per serving, the tea is available now from Coles and Woolworths stores. **arkadiabeverages.com.au**

Yoghurt for a healthy gut microbiome

Vaalia's Kefir range of lactose-free yoghurts uses 14 strains of beneficial bacteria to boost gut health but unlike traditional drinkable forms of kefir, these products have been developed for eating with a spoon. The combination of bacteria is designed to aid digestion and increase the level of healthy bacteria in the gut. The range is made without sugar and is available in five flavours: plain, vanilla, strawberry, mixed berry and mango. It can be bought at Woolworths and independent supermarkets now. **vaalia.com.au**

AI-developed milk

NotCo's NotMilk is a plant-based milk that has been developed with the help of artificial intelligence software. The milk is designed to taste, smell and feel similar to animal-based products, as AI software has analysed the animal proteins in milk to find plant-based replacements for them. The milk can pair well with coffee thanks to its textural similarity to animal products. It's available in Woolworths supermarkets around the country. **notco.com**

A unique gin

Heartbreak Gin from Bass and Flinders is fortified with Pinot Noir grapes, giving it a scarlet-red colour with a sweet flavour profile similar to the wine. The gin can be enjoyed neat or in cocktails and thanks to its winemaking hints, it can even pair with foods traditionally served with a glass of Pinot Noir. The gin is available now from selected bottle shops or online. **bassandflindersdistillery.com**

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