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Keeping it real — the vegan disruption



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Understanding human behaviour comes part and parcel with the food industry. Food technologists and manufacturers are constantly striving to meet the ever-evolving changes in consumers' demands and tastes.

Currently in Australia, New Zealand and globally, the meat and dairy industries are being somewhat disrupted by the rising diet trend of veganism. A stricter form of vegetarianism, the vegan abstains from any meat and animal product in their diets, including eggs, dairy products and even honey.

Aussies and Kiwis have always been avid meat and dairy lovers. However, the vegan trend is expected to keep rising and even some of our traditional meat and dairy lovers are turning 'flexitarian' by adding some vegan products to their diet. By analysing the trend, it has been revealed that it stems from a variety of factors such as the rising cost of meat and the growing interest in animal rights, through to environmental issues and the related need to adopt healthy sustainable diets. It also helps that some of the vegan products being produced now are pretty tasty compared to the previous attempts many years ago that tasted like an old boot.

All this is good news for the fresh food industry and many food manufacturers are adding a variety of vegan offerings to their ranges. Some interesting examples include chicken-less egg protein, vegan happy meals, vegan sausage rolls, vegan ice-cream and, of course, vegan burgers. It was recently reported that even one of the largest pork processors in Canada has decided to set up an entire meat-free plant in the US in order to capitalise on the growing demand for plant-based products.

As this appears to be more than just a passing fad, the meat and dairy industries have been taking action and investing for some time in research and development to improve their environmental impact. Work is also underway to develop farm-to-fork traceable and ethical labelling; while at the same time, concerns have been raised about vegan product labelling. Why should a vegan product be labelled as meat or cheese, for example, when the product only contains plant-based ingredients? As the taste and texture is designed to mimic the real thing, some have argued that vegan products should be clearly labelled in order not to mislead the consumer.

As with any industry being disrupted, if the playing field is kept clean without unlawful activism, the industry and consumers could both be winners in the long run with improved products and more varied choices available to suit any appetite. But with recent reports indicating that the vegan diet has had little impact on obesity rates, you never know... we may be heading back to the meat and three veg trend before you know it.

I'm so pleased to be part of the vibrant food manufacturing and technology industry in Australia and New Zealand.



Carolyn Jackson
Editor

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Food FOR thought

Wine label directory clamps down on copycat exporters

The federal government is developing an Australian Wine Label Intellectual Property Directory to prevent copycat wine being sold overseas and better protect Australian wine producers.

Australian wine exports are forecast to top 800 megalitres, with a value of more than \$2.8 billion in 2017–18. However, those producing dodgy copies can be damaging to Australian brands.

“Copycat export wines mimic Australian brands by copying our labels,” Minister for Agriculture David Littleproud said. “This rips off our producers and it also ruins the reputation of our wine when customers expect a quality Australian wine and receive a cheap knock-off.”

The directory — which is part of the \$50 million Export and Regional Wine Support Package — aims to improve the transparency of exported labels, identify copycat labels and ensure fraudsters are held accountable.

“The publicly accessible directory will require all Australian wine exporters to submit images of their labels prior to gaining export certification,” Littleproud explained. “It will be searchable by image elements, brand name and publication date and will display the trademarked image of labels, the exporter ABN, brand name and date the label was published to the directory.”

Copycats could be stripped of their export licence, and those being copied could also take legal action under the Trade Marks Act 1995.

Australian Grape and Wine welcomed the announcement, stating it will help Australian wine businesses bolster their reputation with consumers in international markets.

The government invested \$417,000 to create the directory, and its ongoing administration will be funded by industry.



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Activist map restricted by Privacy Act

Australian farmers are set to be better protected from attacks from activists with the Aussie Farms Incorporated website now listed under the Privacy Act.

Attorney-General Christian Porter said the activists posed a risk to hardworking farming communities and producers. “The company publishes information about Australian farmers and agricultural producers including their names and addresses, exposing them to potential trespass, biosecurity hazards and reputational damage.”

The website features a map which the National Farmers’ Federation (NFF) said is “designed to incite people to enter the identified premises without authorisation to obtain covert footage”.

Since the group published the addresses of more than 3000 farm and farm-related businesses on the map in January, NFF said there have been more farm invasions. “Common sense would directly link this to the Aussie Farms map.”

Until now, the company was exempt from the Privacy Act because its annual turnover was less than \$3 million, but as it is now prescribed as an ‘organisation’ under the Privacy Act, it must comply regardless of its annual turnover. If Aussie Farms breaches the Act, which includes laws against the misuse of personal information, it risks penalties of more than \$400,000.

The company refused to take the website down despite several requests from Minister for Agriculture David Littleproud.

“The farming families who grow our food deserve to be able to do so without fear of invasion on their property and harm to their children,” Littleproud said. “The fact Aussie Farms refused to take the website down when invasions began happening on farms displayed on their map shows they intend for it to be used as an attack map for activists.”

He called on state governments to provide real penalties for trespass and to publicly state they expect the police to uphold these laws.



GFSI AusNZ forms to elevate food safety and consumer trust

Woolworths Group, The Coca-Cola Company, Coles Supermarkets, Kerry, Campbell Arnotts, Fonterra, McDonalds and Goodman Fielder, along with 50 other retailers, manufacturers and food service companies, have formed the steering committee of the newly formed GFSI AusNZ.

A part of its regional outreach model, the Global Food Safety Initiative (GFSI) is encouraging the formation of Local Groups with the Australia and New Zealand group joining existing groups in Japan, China, Europe, US-Canada, Mexico and South Latam.

The creation of this group results from a desire to better leverage GFSI in the region at a time when the industry is experiencing pivotal change. The food industry in Australia and New Zealand has a strong agricultural base and a 'clean and green' reputation. In recent years, concerns linked to foodborne pathogens, contamination and food defence have received attention while the food supply has come under increased observation.

The region is following a global trend to focus increasingly on preventive measures and leverage industry-led initiatives such as GFSI to complement regulatory oversight. The industry has a long association with GFSI through Technical Working Groups and the GFSI Conferences. The formation of the GFSI AusNZ Local Group will formalise that relationship and assist in establishing GFSI initiatives across the local industry while addressing local issues.

The GFSI Board created the regional network to support GFSI's efforts in different parts of the world and to promote a harmonised approach to managing and improving food safety across geographies.

The GFSI AusNZ Local Group will initially focus on three strategic priorities:

- Developing awareness of GFSI and harmonising certification programs.
- Building capability in companies who want to put in place or improve their food safety systems by leveraging the Global Markets Programme as a pathway to certification.
- Engaging state and federal food safety authorities in a dialog around GFSI to promote public-private partnerships.

To learn more, visit GFSI AusNZ at www.myGFSI.com.



Atlas Copco increases French coverage

Atlas Copco has acquired French compressor distributor S.A.S. Air Diffusion, which will expand its coverage in the region.

Based in St. Etienne, Air Diffusion has around 15 employees and a diverse group of small to medium-sized customers in the manufacturing, food and beverage, wood, plastic and foundry industries.

Vagner Rego, Business Area President Compressor Technique at Atlas Copco, said the acquisition "allows us to increase our service offering and our support to customers".

Air Diffusion has been acquired by Exlair S.A.S., part of Atlas Copco Holding France, for an undisclosed sum.



Breeding strawberries with specific traits

Whether it's increasing the flavour or producing a disease-resistant variety, breeders may be able to grow strawberries that satisfy all needs after scientists have uncovered the genetic roadmap of the cultivated strawberry.

Published in the journal *Nature Genetics*, an international team of scientists led by the University of California, Davis, and Michigan State University have sequenced and analysed the genome of the cultivated strawberry, which will provide a genetic roadmap to help more precisely select desired traits.

"Without the genome we were flying blind," said Steven Knapp, Professor of Plant Sciences and Director of the UC Davis Strawberry Breeding Program. "It was like having a library of books, but all the books' pages were blank."

This will help growers who struggle to protect the fruit against diseases such as Fusarium wilt, Verticillium wilt and Macrophomina without having to use fumigants. The assembled genome will allow scientists to pinpoint specific genes that can protect the plant against diseases, and sequencing the genome will help unravel the complexity of strawberry diseases that involve several different genes.

"The genome sequence is powerful because it provides scientists with barcodes for nearly all the genes in strawberry. We can use that information to identify genes that play an important role in traits of agricultural importance," Knapp said.

Scientists may also be able to find genes that lead to increased flavour or aroma for the consumer, while maintaining the firmness and shelf life for producers.

Patrick Edger, co-corresponding author with Michigan State University, and his team also deciphered the origin and evolution of the cultivated strawberry. Unlike humans, where each cell contains two complete sets of chromosomes, the cultivated strawberry is an octoploid, meaning each cell in a strawberry plant contains eight complete sets of chromosomes, so untangling its evolution is a feat.



Food FOR thought

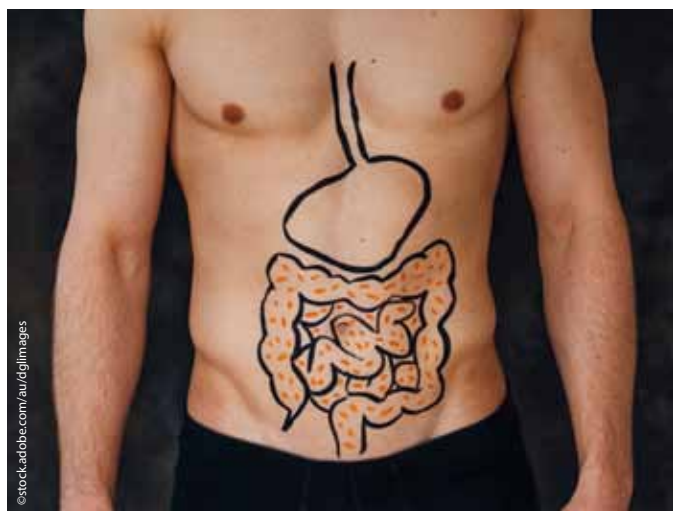
Interspecies communication in the gut

Move over sci-fi — interspecies communication is already going on in your gut and it's the bacteria, not you, that are the boss.

Not only do bacteria in the gut help digest food they also communicate with their mammalian hosts and actually tell them what to do.

A study published in *Cell* describes a form of 'interspecies communication' in which bacteria secrete a specific molecule — nitric oxide — that allows them to communicate with and control their hosts' DNA, and suggests that the conversation between the two may broadly influence human health.

The researchers out of Case Western Reserve University School of Medicine, University Hospitals Cleveland Medical Center and Harvard Medical School tracked nitric oxide secreted by gut bacteria inside tiny worms (*C. elegans*, a common mammalian laboratory model). Nitric oxide secreted by gut bacteria attached to thousands of host proteins, completely changing a worm's ability to regulate its own gene expression.



The findings suggest nitric oxide is a general mechanism by which gut bacteria can communicate with mammalian hosts. Previous work to untangle communication lines to and from gut bacteria has primarily focused on rare molecules that bacteria secrete. The new findings are akin to uncovering a chemical language common across species, as opposed to single words.

The study adds to a growing body of evidence that bacteria living in the gut, determined by diet and environment, have a tremendous influence on mammalian health.

Stamler imagines nitric oxide may represent an opportunity to manipulate this symbiotic relationship. Just as probiotics are designed to improve digestion, inoculating a person's gut with bacteria to improve nitric oxide signalling is conceivable.



Researchers closer to understanding cause of mango disorder

Researchers have found that bacterial infection is the likely cause of resin canal discolouration (RCD) in Australian mangoes, which is estimated to cost the Northern Territory mango industry between \$5 million and \$10 million per year.

Mangoes have an extensive network of canals just under the skin and in the flesh which store resin, or sap. The normally flesh-coloured canals become brown or black as the mangoes ripen when infected with RCD.

Although affected mangoes are safe to eat, the discolouration makes them less appealing to consumers, and researchers have previously struggled to establish the cause.

Umar Muhammad has been researching RCD in mangoes for his PhD with the ARC Training Centre for Innovative Horticultural Products, based at the Tasmanian Institute of Agriculture (TIA). Muhammad and his fellow researchers artificially induced the RCD bacteria into healthy mangoes, and found zero infection in the controls and 100% infection in the manually infected fruit. Dr Cameron McConchie, Research Leader at the Department of Primary Industry and Resources, said this discovery was the biggest local breakthrough in understanding the cause of RCD.

"We found RCD occurs post-harvest and that avoiding contamination is essential to prevent it," he explained.

The researchers also found that RCD can spread through contact with the intact skin of infected mangoes, and some mango cultivars are more susceptible to RCD than others.

"At this stage, we can only say that Kensington Pride are susceptible, and it appears that symptoms are more severe in fruit from Darwin than further south," Dr McConchie said. "We know that some of the new mango varieties we've been developing are very resistant to RCD, even when the infection is injected directly into the fruit."

TIA's Associate Professor Alistair Gracie, who has overseen Muhammad's project, said it had been a collaborative, cross-sector success between mango growers, Northern Territory Government scientists and TIA's food science researchers.



Images courtesy of the University of Tasmania.



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Keeping bananas free from disease

The Queensland Government is providing over \$12.1 million to the banana industry over five years to help control and contain Panama disease tropical race 4 (TR4).

Minister for Agricultural Industry Development and Fisheries Mark Furner said a recent independent review of the Panama TR4 Program stated that tackling the disease should be a shared responsibility between government and industry. While the government will continue to fund the existing TR4 program until 30 June 2019, it recently advised the Australian Banana Growers' Council (ABGC) that from 1 July onwards, funding would only continue under a cost-sharing arrangement with industry.

ABGC Chair Stephen Lowe said the TR4 Program, run by Biosecurity Queensland (BQ), is worth investing in considering its success so far.

"No other country with Panama TR4 has had the same success in containing the disease as we have here in North Queensland. But the reality is that Panama TR4 is here to stay and it will eventually spread. Therefore, planning for the future is critical," said Lowe.

ABGC and Biosecurity Queensland recently formed a working group to develop a formal partnership agreement to fund, deliver, design and govern the Panama TR4 Program over the next four years.



Undeclared allergens main culprit of recalls

Of the 100 Australian food recalls in 2018, 46 were due to undeclared allergens, according to data from Food Standards Australia New Zealand (FSANZ).

Using consumer complaints, distributor or retailer complaints, company and government testing and/or in-house testing, FSANZ has identified the key causes of allergen-related recalls. The four main categories of problems were: lack of skills and knowledge of labelling requirements; supplier verification issues; packaging errors; and accidental cross-contamination either of a raw ingredient or during final production process.

Packaging errors — which included using the wrong packaging and dairy-free claims instead of gluten-free claims on the front of packets — tended to be the leading cause of undeclared allergen recalls, accounting for 33% in 2016, 65% in 2017 and 54% in 2018. However, the data suggests the industry is well-educated, with a lack of skills and knowledge causing only 4% of recalls in 2018 and causing none in the previous two years.

Although 13 food business listed no corrective actions, the majority listed a number of actions which included training for staff, improved processes and procedures, and altered product labels.

FSANZ Chief Executive Officer Mark Booth said the number of recalls increased from 69 in 2017 to 100 in 2018, with 46% due to undeclared allergens and 20% from microbial contamination.

For more information on food recall allergen statistics from 2016–2018, visit www.foodstandards.gov.au.



WF Media partners with FoodTech Qld event

WF Media, via its food industry media brands *What's New in Food Technology & Manufacturing* and www.FoodProcessing.com.au, has partnered with Diversified Communications for their upcoming FoodTech Qld event.

The triennial Queensland industry event for the food and beverage manufacturing industry brings together 130 exhibitors showcasing a broad range of new products and innovations. Over 2400 visitors are expected over the three-day event, which also includes a series of SME workshops and seminars.

WF Media will publish the official FoodTech Qld Show Guide, which will also be distributed with the July/August issue of *What's New in Food Technology & Manufacturing* magazine to Queensland subscribers.

FoodTech Qld will be held at the Brisbane Convention & Exhibition Centre from 28–30 July 2019.

To register for the free event, visit register.foodtechqld.com.au/FOODTECH19B/.

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Getting a grip on all shapes and sizes

Robotic gripper for fragile and heavy objects

Researchers from MIT and Harvard have developed a new robotic gripper with a cone-shaped origami structure that collapses in on objects, much like a Venus flytrap. The gripper is capable of picking up items that are as much as 100 times its weight and grasping a wide range of objects — from soup cans and wine bottles through to a single broccoli floret or a grape.

The project is one of several in recent years that have researchers thinking outside the box with robot design. Ball-shaped grippers, for example, can handle a wider range of objects than fingers, but still have the issue of limited angles. Softer robotic fingers typically use compressed air, but aren't strong enough to pick up heavier objects.

The structure of this new gripper, meanwhile, takes an entirely different form. Cone-shaped, hollow and vacuum-powered, the device was inspired by the 'origami magic ball' and can envelop an entire object and successfully pick it up.

"Previous approaches to the packing problem could only handle very limited classes of objects — objects that are very light or objects that conform to shapes such as boxes and cylinders," said MIT Professor Daniela Rus, Director of

MIT's Computer Science and Artificial Intelligence Laboratory (CSAIL) and one of the senior authors of a new paper about the project.

"With the Magic Ball gripper system we've shown that we can do pick-and-place tasks for a large variety of items, ranging from wine bottles to broccoli, grapes and eggs.

"In other words, objects that are heavy and objects that are light. Objects that are delicate, or sturdy, or that have regular or free-form shapes."

The gripper has three parts: the origami-based skeleton structure, the airtight skin to encase the structure, and the connector. The team created it using a mechanical rubber mould and a special heat-shrinking plastic that self-folds at high temperatures.

The magic ball's skeleton is covered by either a rubber balloon or a thin fabric sheet, not unlike the team's previous research on fluid-driven origami-inspired artificial muscles (FOAM), which consisted of an airtight skin surrounding a foldable skeleton and fluid.

The team used the gripper with a standard robot to test its strength on different objects. The gripper could grasp and lift objects 70% of its diameter, which allowed it to pick up and hold a variety of soft foods without causing damage. It could also pick up bottles weighing over 1.8 kg.

The robot currently works best with cylindrical objects like bottles or cans, which could someday make it an asset for production lines in factories. Not surprisingly, the shape of the gripper makes it more difficult for it to grasp something flat, like a sandwich or book.

This project was supported in part by the Defense Advanced Research Projects Agency, the National Science Foundation and Harvard's Wyss Institute.



8 technologies for the food and beverage industry

Helen Masters, Senior Vice President and General Manager, Asia Pacific at Infor



Below is a list of the top eight technologies that are essential for companies in the food and beverage industry to remain competitive in a crowded market.

1. Modern ERP solution built for the food and beverage industry

Most mature businesses likely have an enterprise resource planning solution already. However, larger businesses often inherit outdated software overloaded with patches and inefficient applications. Start-ups will most likely be trying to make do with a generic accounting solution that focuses on AR/AP and inventory.

Modern ERP solutions have made major advances in the past few years as transformative technologies have broadened to include planning, forecasting and analysis tools. There are also industry-specific solutions on the market, providing features and benefits already built in. This can mean no more cumbersome modifications to the code-set which can complicate and delay further upgrades. These solutions can also provide agility and added insights from the built-in analytics.

2. Customer relationship management

Everyone knows how critical the relationship with the customer is to the overall success of the company. The modern customer — whether in B2C or B2B — has high expectations. Both you and your competition are likely to be looking for ways to enhance the customer experience and stay engaged with consumers in a meaningful way — whether it is staying on top of orders, anticipating seasonal offerings or planning customised promotions or product offerings. Customer relationship management (CRM) solutions help you manage and enhance the customer relationship, turning it into a differentiating feature.

3. Human capital management

A company is only as strong as its workforce. A modern food and beverage company relies on a workforce with a wide range of skills, from technologists in R&D to procurements teams who must continually find fresh ingredients and anticipate shifting demands. Recruiting, training and retaining a workforce with such a wide range of skills sets can be a daunting challenge, especially today as skilled workers are at such a premium. A HCM solution can help to recruit and retain the best talent.

4. Enterprise asset management and Internet of Things

The combination of a solution to manage the life cycle of plant machinery and IoT sensor technology can give a company a competitive edge. These applications can help keep plants running without unexpected downtime. The embedded sensors monitor for early warning signs that indicate needed maintenance or service. The system then triggers an automated response which, in the long term, can extend the life cycle of machinery.

5. Product life cycle management

Consumers today expect frequent introductions of new products; they want more offerings, new product choices, innovative taste combinations, and new packaging and preparation methods. This means you need to be continually researching and developing new products. A modern PLM solution can help to streamline the process and bring products to market faster.

6. Warehouse management solution

As your business grows, so does the challenge of managing your inventory of ingredients and finished goods. When you add in the additional challenges of coolers, freezers and even off-site warehousing, visibility and responsiveness become difficult. A modern warehouse management system can embrace a mobility to aid with two-step put-away, cross-docking, slotting and inbound deliveries for a fast and efficient handling of goods to shorten the time to when it is available.

7. Supply chain management

Modern F&B companies typically need to leverage complex supply chains and networks of suppliers — often global. Complete visibility to location and status of shipments is essential for freshness and just-in-time-arrival of ingredients needed for the processing schedule. An advanced supply chain system which allows you to make real-time adjustments can be a game changer.

8. Cloud deployment

Deployment in the cloud often goes hand in hand with updating ERP software or adding new solutions. All of the solutions listed above can be deployed in the cloud. In order to stay competitive, businesses need to be using the most agile and flexible solutions.



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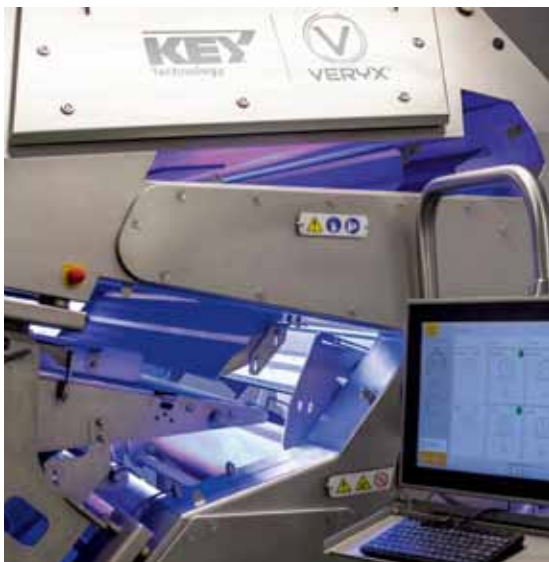
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Software for digital sorters

Key Technology has introduced its Sort-to-Grade (STG) software for VERYX digital sorters. The patented software is available for food sorting applications including fresh and processed fruits and vegetables as well as nuts.

An STG-enabled sorter dynamically evaluates each decision based on how it impacts the aggregate 'in the bag' grade, as defined by the processor. Controlling the output for defect categories of various severity and/or product dimensions, the software accurately delivers complex final product specifications without operator intervention, while increasing yields by 1–3%.

STG recognises and categorises the visual and structural characteristics of individual objects in the product stream. It can allow a specific amount of low- and middle-severity defects to pass, based on user-defined allowable tolerances for each defect category, while ejecting all high-severity defects and foreign material (FM).

VERYX with STG can identify and classify each object's colour, size, shape, structural properties and/or chemical composition. To meet the allowed tolerance for the grade, the software manages specific types, sizes and locations of defects as well as colour grades, if needed.

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Denesting tool for trays

The Intray Smart Tool quickly denests and transports trays from the stack onto the conveyor band.

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Features include: open design which can be easily cleaned, easy tray change in 30 s, weighs 12 kg and is servo driven so needs no compressed air.

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Forklifts powered by lithium-ion batteries

The Noblilift Li-ion powered pallet movers and stackers are available in Australia through MLA Holdings.

The Li-ion battery-powered machines can provide advantages over traditional lead-acid battery alternatives, including rapid charging, longer run time, zero maintenance, improved workplace safety and absence of emissions.

They have several advantages in any industrial setting and are particularly suitable for sensitive industries, such as food and pharmaceuticals.

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Vacuum tube lifter

The Schmalz JumboFlex High-Stack is a vacuum tube lifter that can be used to ergonomically stack goods with a maximum weight of 45 kg and up to a height of 2.55 m.

The lifter has a long, swivel-mounted operator handle. It provides scope to expand upward when lower-level storage space is limited and pallets for containers or trucks can be packed in such a way that the available volume is optimally utilised. Loads close to the ground can also be raised without risking injury to backs. The operator can grip goods with a minimum height of 30 cm while keeping the body upright.

The product has an ergonomic one-hand grip for controlling the tube lifter, which can be operated intuitively by both left-handed and right-handed operators. An additional handle makes it even easier to guide the tube lifter with the second hand — for example, when fine-tuning the height of the workpiece. The device can be infinitely adjusted and thus ergonomically designed for every operator.

The workpiece can only be released in a lowered position. The operator must push the button for lowering the load all the way down before a second, mechanical lever can be actuated. This lever releases the vacuum. This safety function prevents the workpiece from falling prematurely or unintentionally. In addition, the ventilation of the gripper takes place so fast that no additional effort is required to release the tube lifter from the workpiece.

The rotation unit of the operator handle can be rotated continuously, ensuring freedom of movement. This prevents the hose from twisting and gives the operator the flexibility to operate the device from all directions. Alternatively, the gripper can be fixed in 90° increments.

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Pallet washers

Industrial pallet washers and pallet washing systems can be built to users' requirements. A Rhima pallet washer can wash any type of pallet and the machine can be semiautomatic or fully automatic.

The semiautomatic machine washes the pallets vertically. Pallets are placed onto the conveyor and pass through a hot, detergent wash, followed by a freshwater sanitising rinse and a blow-off section. Additional wash and rinse zones are possible.

With the automatic system a stack of soiled pallets is placed at the entry section and a destacker loads individual pallets into the machine. The pallet is first pre-washed, followed by a hot detergent wash and a freshwater sanitising rinse. The pallets are then dried by means of hot air. Clean pallets are automatically unloaded and stacked ready for removal.

Rhima can supply machines built to order and to users' specifications to comply with HACCP guidelines, including GMP design. A range of off-the-shelf products is also available.

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Communicate product recalls quickly with GS1 Australia Recall

Managing a food product recall in the digital age means businesses need to have the right systems and procedures in place to respond quickly and effectively.

Recalls, especially of contaminated meat and seafood products, play out publicly and issues can break in real time on social media, often well before the related company is aware of the event.

In this scenario time is your enemy, as consumers expect defective products to be swiftly removed from the marketplace and to be kept fully informed about all aspects of the recall, including any associated health risks.

This requires suppliers, brokers, wholesalers and retailers to have in place a common communication tool that simplifies the recall or withdrawal process for all stakeholders to ensure there is visibility of product data, timely reporting and an audit trail.

Developed in consultation with industry and government agencies, the GS1 Australia Recall online portal is designed for food, grocery and general merchandise businesses to minimise the impact and cost of product recalls and withdrawals.

Key functions of the portal include bulk product uploads, mobile alerts for your trading partners, and reports for regulators and stakeholders. The service is used by hundreds of Australian companies and supported by major retailers such as Coles and Woolworths.

Leading risk practitioners and associations Victual, Liberty Underwriters and the Recall Institute recommend companies use the portal as it simplifies the communication process.

“When it comes time to push the button, GS1 Australia’s Recall portal ensures trading partners are notified quickly, but importantly, in one notification and with the ability to confirm



receipt of that notification. It frees up our clients to focus on what’s really important — maintaining relationships with customers and consumers and getting back to business as soon as possible,” said Recall Institute Director Steve Hather.

“Subscription to GS1 Australia Recall is a key element of effective product recall preparation and management,” Hather said.

A whole-of-industry solution, GS1 Australia Recall meets the full reporting requirements of, and is integrated with regulators including the ACCC and Food Standards Australia and New Zealand (FSANZ). It is also certified by the leading food safety methodology body, Hazard Analysis and Critical Control Points (HACCP) Australia.

GS1 Australia
www.gs1au.org

NEWS

Scientists develop seaweed-based beer

University of the Sunshine Coast (USC) scientists and Newstead Brewing Co have partnered to develop a beer brewed with ‘sea lettuce’ from Moreton Bay in an effort to promote seaweed as a nutritious, locally grown resource.

To create the Moreton Bae Resalinated Gose beer, Newstead brewers steeped 25 kg of iron-rich ulva sea lettuce in cold water to extract the salt characteristics and flavours to add to the ‘gose’ style beer. With origins dating back centuries to Goslar, Germany, gose is historically a lightly sour, wheat-driven beer with coriander and salt flavours, said brewer and former marine microbiologist Dr Evan Goulden.

“For this beer, we used desalinated water from Seqwater — which is completely salt-free — and instead we used seaweed to ‘resalinate’ and reimagine the gose style with a natural briny character. We also left out the coriander because we wanted some of those marine volatiles and the spiciness from the seaweed to shine.”

The partnership will help drive public awareness of responsible and sustainable farming of seaweed, which is a fast-growing, plentiful resource that can help address food security concerns. USC Associate Professor of Aquaculture Dr Nick Paul said the seaweed used for this project was grown at USC’s research facility at Bribie Island in just one week. As consumer interest in seaweed is growing rapidly, he said it made sense to consider applications for Australia’s

food, beverage, health and biopharmaceutical industries.

The beer is available in Queensland.



Gas detection series for refrigerant safety compliance

The Bacharach MGS-400 Gas Detection Series is used for commercial and industrial refrigerant and gas leak detection.

The gas detectors support safety compliance inside of machinery rooms, mechanical equipment rooms, chiller plants, cold storage facilities and walk-in freezers by monitoring for dangerous refrigerant leaks for numerous gases including HFCs, HFOs, HCFCs, CO₂, and NH₃ (ammonia). The system is used to detect refrigerant leaks and quickly initiate alarm systems, which helps to protect personnel and achieve compliance with safety standards like ASHRAE 15, CSA-B52 and EN 378.

The gas detectors are supported by a mobile app user interface and features plug-and-play, pre-calibrated sensors for easy installation and replacement in the field.

The optional MGS-408 Gas Detection Controller supports up to eight sensor channels and enables a centralised alarm and power system. With Modbus connectivity, the controller integrates with any facility's existing building management or automation system. The MGS-408 also connects with Bacharach's MGS-250 IR-based refrigerant monitor and the dual-sensor MGS-550, allowing for flexibility of individual site requirements.

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Fluid Technology Group

Keeping milk fresh with an automated order picking system



Synlait plant in New Zealand.

New Zealand-based Synlait Milk will improve material flow and throughput from production to dispatch at its new liquid milk production facility at Dunsandel using an automated order picking system.

Synlait produces a range of nutritional milk products; since 2008, its Dunsandel site has grown to become one of the largest integrated infant formula sites in the world. To expand its product portfolio to include liquid milk, the company is building a new production and packaging facility.

Cimcorp, a manufacturer and integrator of turnkey robotic order fulfillment and tire-handling solutions, will install its MultiPick materials handling solution at the new facility, enabling Synlait to transport 1800 crates from inventory to loading every hour and easily meet production rates of 7000 crates per day. As part of a project with food packaging and processing integrator Tetra Pak, it will fully automate Synlait's order picking process.

"We're excited to work with Cimcorp and Tetra Pak to automate the order picking process within our new production facility," said Neil Betteridge, Synlait's Director Operations. "The speed and precision offered through automated materials

handling will help us streamline operations and maximise the freshness of our new liquid milk products. It will also improve the health and safety of our people, as staff will not be required in cold storage areas for long periods of time. We'll have a modern facility, ready to meet the demands of today's food supply chain."

At the core of the solution will be Cimcorp's Warehouse Control System (WCS), which will provide control over all inventory management, system functions and pick planning, as well as integration with the order management system.

Cimcorp Distribution Sales Manager Derek Rickard said, "With an automated picking process, Synlait will be able to significantly increase its order fulfillment speed and shorten its lead times, resulting in maximised product shelf life — a critical aspect of the dairy business. Moreover, the WCS software will help Synlait not only optimise material flow with advanced control over product movement and order accuracy, but also collect and provide traceable data to support food safety requirements."

Installation of the system began in the first quarter of 2019.

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Enjoying more of the 'Creature Comforts'

Matthew Schnetzer

A fully automated brewhouse that produces 50,000 barrels of beer annually has been opened by Creature Comforts Brewing in order to keep up with the increasing demand for its craft beer.

Creature Comforts has made an indelible mark on the Georgia brewing scene in the US since it first opened its doors in downtown Athens, Georgia, four years ago. The site, located just about an hour outside of Atlanta, contains a four-vessel, 30-barrel brewhouse which, after just four years in business, could no longer keep up with the company's increasing demand.

"It is a very manual system," said Adam Beauchamp, co-founder and brewmaster. "We wanted a bigger and better solution able to produce higher volumes."

When the company started its expansion plans in early 2017 for a second location, it was looking for state-of-the-art equipment for brewing, filling and packaging that would fit its high-quality standards. The system had to produce more efficiently, in higher volumes, and be a fully automated processing system.

After conducting extensive research and visiting several facilities with equipment similar to what the company had envisioned, Creature Comforts chose a four-vessel Steinecker CombiCube B brewhouse from Krones. Now, it's able to brew 85 barrels of beer per brew, which more than doubled its previous output immediately. "The quality of the brewhouse was evident and the price was better than the competition compared to other fully automated systems," Beauchamp said. "And from start-up we never had to throw out a batch — not even the first one."

Some of the things Adam Beauchamp likes about the Krones Botec process control system — besides it meeting his quality expectations — are its ease of use, the myriad recipes available for the batch process and how easy it is to train people on it: "You have ultimate control over the process — every single detail," he said. "Nearly every batch is consistent. For craft

brewers with hundreds of brewing options, this is very key to a quality brew. I think Krones really understands craft brewers better than a lot of companies."

Creature Comforts demands quality not only for its brewhouse but also for its can filling operation. That's why the craft brewery chose the Krones Craftmate filler, which can fill 250 12-ounce cans per minute. Daniel Sossa, Packaging Manager for Creature Comforts, had worked on Krones equipment before at another brewery and said he appreciates the technology because of its precise fills and ease of maintenance: "I like that the filler is infinitely scalable. It's a perfect option for a counter pressure filler that isn't mechanical."

Filling 'up'

Creature Comforts' new facility is in a renovated textile mill that is over 100 years old, which presented some retrofitting challenges when the time came for installation and integration. For example, the cellar needed to be installed in the basement, but the can filler was located on the second floor. So the beer needs to be pumped upwards. An extensive conveyor system was also needed to connect the machines in their various locations in the basement and second floor. Krones provided the technological support to integrate the line controls and get the job done quickly and effectively, tapping into the expertise of its subsidiary, Process and Data Automation (PDA), to tie it all together. "Krones brought in the full force," Beauchamp said. "The project was on a time crunch with the renovation and Krones met the challenge. They were great at getting the service, technology support and training to get us to close the time gap."

PDA is an industrial control systems integrator within the Krones Group and implements the group's digitalisation strategy in



the US. "I think what I was most proud of was that the process felt seamless to the customer," said Jeremy Anderson, Service Manager for PDA speaking of the integration of the Krones equipment. "All they knew was Krones stepped up to the plate and brought everything together on time and met their expectations."


Beauchamp said what impressed him most was that the Craftmate can filler reduced the total packaged oxygen (TPO) by 50% over its original operation.

Brewhouse

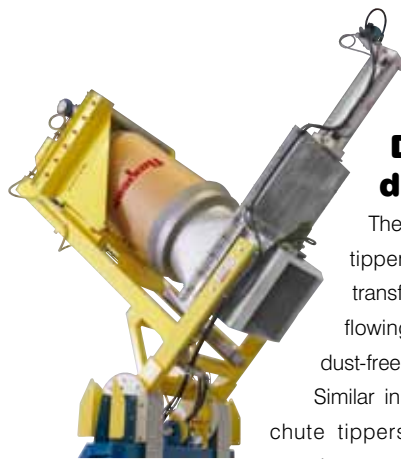
Creature Comforts' new 40,000-square-foot (3700 m²) facility produces 50,000 barrels of beer at current annual capacity. Its new 4-vessel Steinecker CombiCube B brewhouse is a concept for cold wort volumes of up to 85 barrels per brew. It comprises a mash tun, lauter tun, wort kettle and whirlpool. The

brewhouse also features a special automated wort souring capability that Creature Comforts uses for its Berliner Weisse 'Athena' beer.

The brewhouse is fully automated, using Krones' Botec F1 process control system, which monitors and controls every stage of batch production — so every batch is consistent and 100% reproducible.

The Krones Craftmate can filler is good for the low output range. It safely cans even small production quantities starting from 12,000 containers per hour. Creature Comforts' 24-valve Craftmate can filler can fill 266 12-ounce cans per minute. 

Krones Co Ltd
www.krones.co.th



Dust-tight drum tipper

The Flexicon Tip-Tite drum tipper allows for the rapid transfer of free- and non-free-flowing bulk solid materials dust-free.

Similar in performance to open-chute tipplers but with total dust containment, the outlet on the downstream end of the tipper is nearly equal in area to that of the drum opening. This allows for agglomerated materials and large chunks to be discharged with minimal possibility of material bridging.

Drums from 114 to 208 L are positioned on the tipper platform, which is raised by a hydraulic cylinder, seating the rim against the circular end of the discharge transition. A second hydraulic cylinder tips the platform-hood assembly and drum, stopping at dump angles of 45, 60 or 90°.

The stainless steel transition can be supplied with a square or rectangular outlet, as well as with circular outlets.

Non-product-contact materials of construction can be specified in carbon steel with durable industrial finishes, or stainless steel finished to industrial or sanitary standards.

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Energy-efficient pump provides gentle handling of pouring creams

A E Rodda and Son has been making Cornish clotted cream since 1890, when Eliza Jane Rodda, great-great grandmother of the current Managing Director, Nicholas Rodda, started making Cornish clotted cream in her farmhouse kitchen in the heart of Cornwall. 128 years later, the company still maintains many traditional methods of manufacturing.

The creamery installed a new depositing machine at its factory and as the company had already achieved success with a MasoSine pump from Watson-Marlow Fluid Technology Group (WMFTG), it returned to the same source for a second unit. This time around, an energy-efficient Certa 100 was recommended to transfer a range of double and single cream products from mobile storage tanks to the hopper of the new depositing machine.

The new depositing machine essentially deposits cream into a pot and seals it with a lid. "We needed to look for a suitable pump to transfer the product from mobile storage tanks," explained Maintenance Supervisor Paul Johnson.

"Over the past six years of hard work we've had virtually no maintenance issues with the SPS 200; it has basically looked after itself," Johnson stated. "Importantly, the pump does not damage or compromise product integrity, which is crucial to our production process."

This same approach was needed for the company's new pouring cream production facility: low shear, low pulsation and gentle handling.

"Using a centrifugal pump, for example, would effectively churn the cream into something like butter," Johnson said. "A sine pump was clearly the way forward and we were keen on the new Certa from WMFTG, especially because of its energy-efficiency attributes."



Unlike traditional pumps with rotors that cut through the fluid, Certa's sinusoidal rotor gently carries product through the pump to reduce shear, while cutting power consumption by up to 50% with high-viscosity fluids. Further advantages and high performance levels delivered by sinusoidal technology include virtually no pulsation, simplicity, reliability, interchangeable parts and low cost of ownership.

Watson-Marlow's technical team advised A E Rodda and Son that the smallest pump in the Certa range, the Certa 100, would meet their requirements. This pump delivers the required flow rate of up to 4200 L/h.

In terms of the process, a mobile storage tank is wheeled up to the new depositing machine, where

upon the Certa 100 transfers cream from one to the other. The pump is mounted low, facilitating a head of two metres into the machine's hopper. No priming is required.

Offering EHEDG (Type EL Class I and EL Aseptic Class I) and 3A certification as standard, the pump is easy to clean for minimal downtime. Cleaner than any lobe or circumferential piston pump, a range of seven Certa pumps is available for flow rates up to 99,000 L/h and pressures to 15 bar.

"We've had the MasoSine Certa 100 for around 12 months and there have been no issues whatsoever," Johnson said. "Moreover, the pump is impressively quiet and is extremely energy efficient. From experience we have learnt that it is three times more expensive to run a pneumatic pump than an electric pump."

Watson-Marlow Fluid Technology Group
www.wmftg.com.au



Pedestrian barriers

The McCue range of pedestrian barriers is designed to protect pedestrians, machines, forklifts, racking and facilities.

The barriers and partitioning systems are designed for any industry that has a warehouse, logistics centre, manufacturing facility or a pedestrian or forklift zone.

The easy-to-install, flexible range offers a variety of solutions protecting everything from wall perimeters, racking, creating traffic lanes, posts, bollards, framing off areas, guard rails and separating equipment from pedestrians. With easy-to-cut polymers, the system can be adapted to the user's facility.

Axellent Automation & Safety PTY LTD

www.axellent.com.au

Diverter valve for CIP cleaning

Coperion and Coperion K-Tron has redesigned their stainless steel WYK diverter valve for CIP cleaning and the ZV rotary valve is now also available in larger sizes from 400 to 630.

Developed for powder and pellets, the diverter valve enables CIP applications to fulfil required criteria especially in the food sector; ie, the diverter valve must be absolutely clean and free of contamination after wet cleaning — with no additional disassembly or manual cleaning. This saves time, effort and costs since manual post cleaning is not necessary. In doing so, the WYK diverter valve can easily be installed even at points that are poorly accessible.

During bulk material conveying, the conical rotor seals the conveying pipes to each other. During CIP cleaning, the rotor is minimally pulled out of the housing and flushed by the cleaning fluid. Now, the diverter valve has been optimised according to current EHEDG guidelines (Class I EL certification is currently in process). Coperion redesigned and optimised the CIP-capable pipe sealing such that now operation with even the finest powders is possible. The pneumatic drives are separated — for turning and pulling the rotor, respectively — so that the rotor is supported on both sides. Along with its compact design, the diverter valve offers an improved cast design with increased surface quality. All materials conform to (EC) Regulation no.1935/2004 and the sealing materials are FDA-conform as well. Moreover, further flange connections, such as those per DIN 11864, can be realised simply on the housing.

The diverter valve is available in sizes DN 65, 80, 100 and 125. It is also available as a standard stainless steel diverter valve without the CIP cleaning function for non-wet cleaning applications. The diverter valve will be offered in Europe and Asia beginning of September 2019 and is expected to be offered in the USA by year end.

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Getting flooring right in a brewery

The floor plays a crucial role in a brewery as it needs to provide protection from the risk from slips, trips, bacteria build-up and unsightly blemishes.

With beer brewed in Australia accounting for 93% of the nation's beer consumption, the functionality and hygiene of brewing facilities are key factors to ensure consistent high standards and high turnovers.

All brewing, keggering and tourist routes need a floor that can provide protection against the challenging on-site conditions while complying with the sanitation regulations and surface characteristics of the Australia New Zealand Food Standards Code.

The ingredients, cleaners, temperatures, impacts and workload inherent to beer production can all take a toll on the floor finish and the material underfoot needs to be made of stern stuff in order to shrug off these conditions.

Polyurethane provides resistance to corrosion, organic and inorganic alkalis and solvents, and has a low porosity of 0.5%. Epoxy systems on the other hand have a porosity that is dependent on the sealer used, and offer a limited resistance to the organic acids that are found in a large quantity of beers.

Chemical attack is typically described as the breaking down of a floor's structure, such that it is no longer able to fulfil its function. It is not only the reduction in functionality of the floor that is a problem, but erosion can also lead to an unsanitary surface, where bacteria can hide and multiply, affecting the cleanliness of the facility.

There are many factors that will affect the chemical resistance profile of a resin flooring system, including its thickness, resin formulation and reactivity of the chemical agent. Certain systems will be able to withstand intermittent exposure to a chemical, but not prolonged exposure, therefore not only the type of chemical

but also the amount on site and the frequency with which it is likely to come into contact with the floor needs to be known.

During the mash process in beer production, long chains of carbohydrates (starch) are transformed into fermentable sugars using enzymes naturally found in the grain. The two most common types of enzymes (alpha-amylase and beta-amylase) are responsible for breaking the large starch molecules into small bits of sugar.

In addition to sugars, such as the fermentable maltose, or unfermentable maltodextrins, hops contain a range of chemical compounds that affect the flavour of the beer, such as the alpha and beta acids. Daily exposure to sugars and acids can lead to corrosion of the floor, especially if they are not cleaned away on a regular basis.


The high cross-linked density of polyurethane means that it can survive intense and sustained contact with the corrosive chemicals and damaging substances most often found in brewing areas. As well as the previously mentioned substances, this can also include:

- caustic CIP cleaners such as sodium hydroxide (30–60%) used at a solution of 1–3% strength at up to 85°C;
- mixed acid detergents like phosphoric (10–30%)/nitric acid (10–30%) blend used as a solution of 0.5–1% strength at up to 85°C;
- hydrogen peroxide and peroxyacetic acid (PAA) mix acid sanitisers;
- hot water up to 95°C;
- high sugar concentrations;
- residual beer and yeast at 0–20°C with around pH 3.8–4.5.



“ There are many factors that will affect the chemical resistance profile of a resin flooring system, including its thickness, resin formulation and reactivity of the chemical agent. ”

In addition to chemical resistance, polyurethanes can be tailored to minimise slip and trip risks, improve cleanability and even actively attack bacteria. A positively textured finish can greatly reduce the chances of slips and trips, making the area safe for both staff and visitors alike. Thanks to the seamless nature of polyurethane, even textured surfaces can be cleaned quickly and easily, with germs and bacteria having no joints to hide in.

The HACCP internationally certified polyurethane flooring range Flowfresh was developed by Flowcrete to meet the stringent hygiene needs of the food and beverage sector. This makes it suitable for Australia's breweries thanks to the functional, clean and long-lasting surfaces that can be created. The product is claimed to reduce the bacterial population on the surface of the floor by up to 99.9%, and so, when teamed with a regular cleaning regime, can help to keep the facility as sanitary as possible. 

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Goulburn Valley farmer slashes energy costs with solar

A pear and stone fruit farming family has reduced its onsite electricity use by about 30% and saved more than \$62,000 a year in electricity after installing a solar PV system across its two cold storage sheds in Victoria's Goulburn Valley.

For more than 50 years, the Rachele Family has been growing, packing and transporting pears, nectarines, plums and peaches to supermarkets shelves from its 300 acre farming operation, but it has recently struggled with rising energy costs.

"We pick our fruit and then we have to pull it down to zero degrees immediately," Co-owner Matthew Rachele said. "This refrigeration takes a lot of energy, it's the most energy-intensive part of our operations."

However, the family was wary that the farm's aging electrical switchboard couldn't support new infrastructure, and lacked the internal knowledge to assess or manage potential technology suppliers.



Images supplied by Verdia.

Australian energy services business Verdia was asked to investigate technical solutions and provide funding via the Clean Energy Finance Corporation-backed Westpac Energy Efficiency Program. The company is a key partner in the program, which has provided almost \$400 million to fund projects to reduce energy use and costs over the past three years.

Verdia CEO Paul Peters said it selected the best of three proposals from its suppliers to install two separate 100 kW solar PV systems at the Rachele Group's Central Park Orchards and Mountain Valley Produce Centre.

The 500 solar panels are connected to the local electricity network via the

farm's internal electrical network and will produce 263,072 kWh of clean, renewable electricity in the first year; enough to power 45 typical homes. As well as cutting electricity costs, excess energy produced during non-peak farming periods is sent back to the grid, earning a small feed-in tariff.

According to Peters, the initial capital investment in the solar system will pay itself off in five years and earn an additional \$1.07 million in benefits over the life of the assets.

"It's helping to take the volatility out of the farm's future electricity contracts, which is becoming an increasing risk for many Australian businesses – particularly energy-intensive operations driven by heating and cooling."

After the initial investigations, Verdia managed the RFQ process and all aspects of the installation, connection and commissioning of the systems. It will continue to monitor the performance of the systems, with regular dashboard reporting showing energy production and cost reductions, and manage potential warranty issues.

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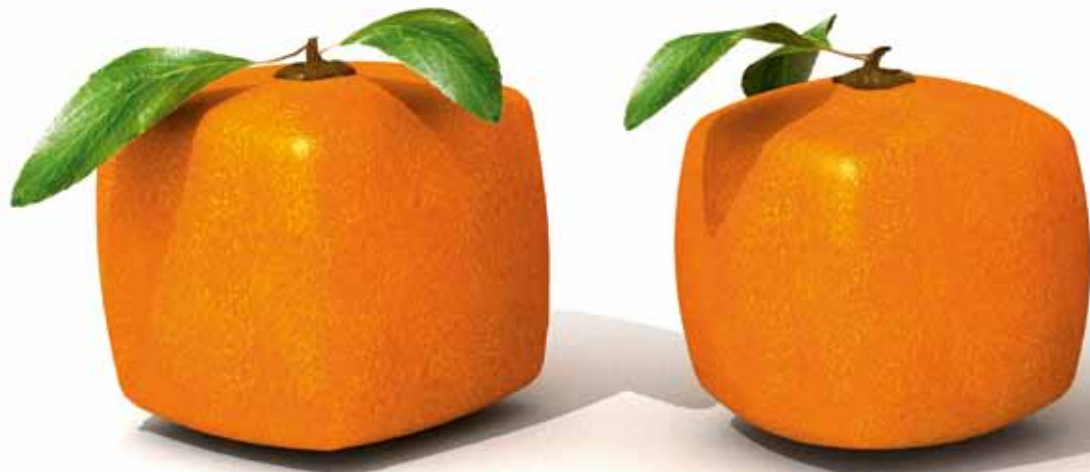
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Embracing the Fourth

What does it mean for the food and beverage industry?

Armin Fahnle, Managing Director, ATS Applied Tech Systems

After reading that researchers in the United Kingdom were growing meat on blades of grass, I was reminded that while engineers like me look to pursue the opportunities afforded by Industry 4.0 as an economically driven (but otherwise largely technical) initiative of the German government, the much broader Fourth Industrial Revolution is much, much bigger!

The 'Fourth' is not just about technology; but rather it is about an emerging and disruptive symbiosis of demand-driven business models and supply-driven technological innovations deeply effecting dramatic changes in the way people learn, work and live.

At a recent visit to the CSIRO Division of Manufacturing in Melbourne, I saw first-hand how the biological, digital and physical domains are coming together in order to print replacement body parts on demand — and being shipped across the world.

Innovative prosthetic parts are one thing, but according to World Economic Forum Founder and Executive Chairman Klaus Schwabb, the Fourth Industrial Revolution will even change what we understand to be human. Our perceptions of humanity will shift as intelligence is increasingly augmented, personality is present in machines, tissue is being regrown and renewed, musculoskeletal systems are augmented and brains are retrained to respond to compensatory artificial stimuli.

Less amazing is the simple observation that disruptive technology enables disruptive business models to proliferate and that these new models allow for change to the very nature of society including the nature, location and value of work — changes that are occurring more rapidly than ever before.

Yet not all countries and regions are as quick to adapt and respond as they need to be.

Impact on food and beverage processors

Talk of cyber-physical systems, IoT, batch size one, digital twins, and so on, leaves bulk manufacturers wondering where

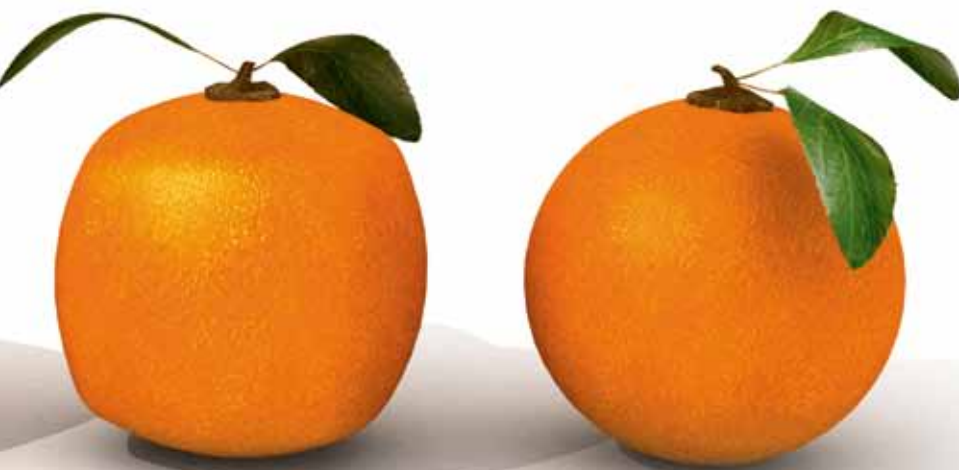
they fit in to this new world. How can the concept of the individualisation of the manufacturing process and 'batch size one' impact on the business of a bulk dairy, vegetable oil or grain producer, for example?

The answer is, of course, that if they haven't yet been impacted, then they will be in the near future, even if we don't yet know how. The degree of foresight necessary to appreciate the change that is coming is a function of business and manufacturing maturity.

The Singapore Smart Manufacturing Readiness Index identifies a readiness or maturity model built on processes, technology and organisation as the core building blocks. These need to be worked on to become smarter and better manufacturers in the world of the Fourth Industrial Revolution. Its practical advice to manufacturing leaders is to:

- learn the Industry 4.0 concepts;
- evaluate the state of the manufacturing enterprise paying attention to 16 different dimensions across the three pillars above;
- architect a digital transformation roadmap designed to improve the maturity level in each dimension of manufacturing readiness; and
- deliver (and sustain) digital transformation initiatives in line with the roadmap over an extended period.

If the visions can be capitalised on, then the rewards are considerable. It has been estimated that S\$36bn of additional value will be created in the Singapore economy and US\$7bn



Talk of cyber-physical systems, IoT, batch size one, digital twins, and so on, leaves bulk manufacturers wondering where they fit in to this new world.



in the Michigan automotive sector alone. Such estimates seem to be very conservative if one considers the long-term impact generated by the previous three industrial revolutions. What has been the long-term impact of electrification, for example?

My personal observation is that most food manufacturing businesses in Australia have a generally low level of awareness of the impact that the Fourth Industrial Revolution will have on their business. They do so at their peril, and with generally quite low levels of digitalisation at the operations management level, there is genuine cause to be concerned that the food manufacturing industry is acting too slowly.

At best, initiatives are mostly focused on the well-established 'Industry 3.0' digitalisation initiatives of labour savings, improved real-time visibility, waste reduction, quality management and data warehousing. At worst, manufacturers are highly reliant on paper records, tacit operator and supervisor knowledge, standardisation of operating procedures that assume long product lifecycles and compliant, hazard control practices.

A well-digitalised manufacturer will have digitalised manufacturing operations management (MOM), energy management, asset performance management, product lifecycle management and management systems for environment, quality, risk, and health and safety.

Many food manufacturers, especially food ingredient manufacturers, collect large amounts of process data in SCADA systems, but have almost no capacity to analyse that data. For them, the opportunities to drive machine learning and to use process analysis to characterise process behaviour and to drive process improvement are lost.

On the execution side, recipe systems are often embedded into SCADA systems and ad hoc databases with poor integration into master recipe management, product lifecycle management or the laboratory activities for product release.

Planning may also be ad hoc, with wall charts and Excel spreadsheets being more the norm than the exception. Production planners struggle to keep up with an increasing requirement for plans to be flexible and adaptive around the needs of the supply chain, unscheduled maintenance and people availability.

Lifting the maturity level to allow progression towards Industry 4.0 requires, first, a commitment at board level; and the establishment of a strategy for the business to become innovative, agile and adaptive — responding to the rapidly changing market by creating or adapting to new business models that leverage the emerging technologies. It is only when the board commits the business to the Fourth Industrial Revolution that the business can embark on the digital transformation journey. And only when that digitalisation journey is well underway, can the business leverage the potential of Industry 4.0.

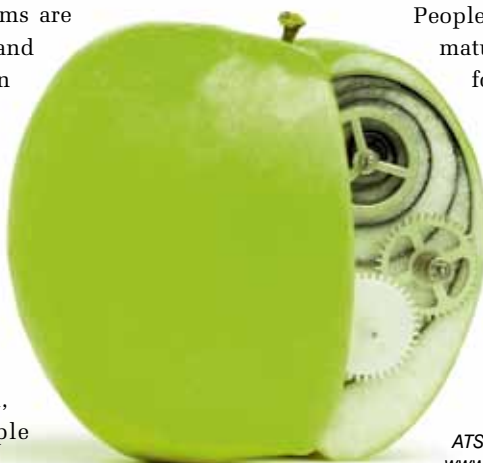
There is no substitute for doing the 'hard work' of manufacturing operations management. Establishing digitalised planning and control systems, including finite capacity scheduling, ensures that customer demand drives the production process and that the available production resources are optimally available. The drivers of the production process need to be right.

Manufacturing and other business processes must also be standardised to ensure that they are repeatable and, therefore, able to be captured in workflows and visual work instructions that can eliminate reliance on tacit knowledge, which works against well-controlled and rapid deployment of market-responsive product formulation, processing and configuration. If Industry 4.0 batch size one is to be achieved, then recipes and processes cannot be the outcome of learned operator practice.

With good volumes of high-quality data that is appropriately turned into information through analytics, baseline performance can be established in a way that is transparent and consistent. A digital baseline allows for the prediction of future performance and the establishment of a continuous improvement practice based on data-driven decision-making.

People, processes, technology and structure must mature together to create the right environment for Industry 4.0 practices and technology to be successful.

The opportunities for Australian industry are considerable, but the confidence level in the region is considerably lower than in Europe and North America. Only when our boards embrace the opportunities and empower their business to embark on the Industry 4.0 journey will the revolution bring rewards.



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Scientists from NIZO in the Netherlands, in close collaboration with Abbott, bioMérieux, FrieslandCampina, Nestlé and U.S. Dairy Export Council, have identified a practical and reliable microbial method to identify heat-resistant bacterial spores in milk powders. Presence and survival of such spores in dairy powders can cause spoilage of UHT-treated reconstituted liquid products.

The study provides tools to standardise tests and enables improved interpretation of spore count test results, in relation to spoilage risks in UHT dairy products.

Many different methods are in use to detect heat-resistant bacterial spores in milk powders. Potentially different outcomes resulting from the application of different methods can lead to disputes between producers of milk powder and their customers, for instance, producers of UHT milk. That is why the scientists evaluated various methods that are commonly used in the food industry to enumerate heat-resistant spores in milk powders.

They compared the most efficient and practical approach with the current ISO method for Enumeration of Specially Heat-Resistant Spores of thermophilic bacteria in Dried Milk (ISO/TS27265:2009).

It was found that application of the Consortium* method provides similar predictability of spoilage of reconstituted UHT-treated milk as the ISO approach, provided that specifications of spores in milk powders are 10-fold higher (eg, 1000 cfu/g when using the Consortium approach and 100 cfu/g when using the ISO approach).

The major advantage is that the Consortium method includes heating for 30 minutes at 100°C. This is much more practical than heating at 106°C, which is in compliance with ISO/TS27265:2009, but requires a special apparatus that is not commonly available.

The continued use of multiple enumeration methods, and subsequent differences in results and interpretations, poses challenges in global trade.

Robyn Eijlander, Senior Project Manager Microbiomics and Food Safety at NIZO, said: "This study presents practical tools for the detection and enumeration of highly heat-resistant spores. This allows for harmonisation of the interpretation of spore concentrations in dried milk within the entire dairy industry, which helps to avoid disputes between producers and customers. Furthermore, their results improve our insights into the prediction of spoilage of reconstituted UHT-treated liquid dairy products."

*The Spores Consortium Initiative

Spores are a primary concern for the food industry: due to their potential high heat-resistant properties, they are the number one cause of spoilage of a wide range of processed foods. In 2013, the Spores Consortium Initiative was launched to reach consensus on the use of the method mentioned above. Together with partners in the food industry, scientists from NIZO have now expanded the Consortium to cocoa powders and plan to address similar issues in various other non-dairy powders, such as soy and pea protein concentrates.



Counting milk powder spores to prevent UHT milk product spoilage



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Technology that can see through food fraud

University of California, Riverside engineers have developed a method to detect counterfeit or adulterated food and drugs just by looking at them. Called “chronoprinting”, the technology can detect fake drugs from a video taken as the sample undergoes a disturbance, similar to the way online photo tools use image analysis algorithms to categorise photos.

It was based on the reasoning that two substances with identical compositions would respond the same way to a disturbance, so if two identical-looking substances respond differently, their composition must be different. To test this idea, UC Riverside Assistant Professor of Bioengineering William Grover and doctoral student Brittney McKenzie compared chronoprints of pure and adulterated olive oil and cough syrup.

Firstly, they loaded pure olive oil and cough syrup into tiny channels on a microfluidic chip, chilled them quickly in liquid nitrogen and filmed the samples reacting to the temperature change using a USB microscope camera. They wrote software that converts the video to a bitmap image and used image analysis algorithms to compare different chronoprints from the same substance. Each pure substance had a reliable chronoprint over multiple tests.

However, when they repeated the experiment with samples of olive oil that had been diluted with other oils and cough syrup diluted with water, the chronoprints were obviously different from the pure samples.

"The significant visual differences between the samples were both unexpected and exciting, and with them being consistent we knew this could be a useful way to identify a wide range of samples," McKenzie said.

"By basically converting a chemical sample to an image, we can take advantage of all the different image analysis algorithms that computer scientists have developed," Grover said. "And as those algorithms get better, our ability to chemically identify a sample should get better, too."

The researchers note that solid materials dissolved in water and other types of disturbance, such as heat or a centrifuge, can also be used. They also suggest it offers a cheaper and simpler alternative to current methods to detect frauds.

The research was published in the journal *ACS Central Science*.

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24-hour *Salmonella* detection

Salmonella spp. is a bacterium that has been one of the most frequently reported causes of foodborne illnesses in humans. Rapid and accurate detection of *Salmonella* in foods and the food-processing environment is important to avoid putting products on the market that could cause outbreaks of salmonellosis.

VIP Gold for *Salmonella* is a lateral flow device that uses proprietary antibodies, with high specificity to antigens of *Salmonella* species. These reagents are configured in a single-use device that will produce a visible line in the presence of *Salmonella*.

A simple next-day enrichment protocol has been developed for the VIP Gold for *Salmonella* to improve the time-to-results and laboratory workflow. The new protocol has been thoroughly validated and has received AOAC certification. Results are read visually, and no specialised equipment is required to run the assay or interpret the results. Furthermore, the amount of hands-on time involved is less than most automated methods.

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Test to combat buffalo mozzarella fraud

Scientists from the Quadram Institute at the Norwich Research Park in the UK have developed a test that differentiates between buffalo and cow's milk, and between the cheeses made from them.

Applying the test to commercial products, they found that many restaurant meals and supermarket pizzas claiming to be buffalo mozzarella are mislabelled, and instead contain mozzarella made wholly or partially from cow's milk.

Buffalo milk commands a premium price compared to cow's milk and is used to make mozzarella cheese. Products labelled as "buffalo mozzarella" must be made solely with buffalo milk, and not with milk from any other species. Mozzarella can also be made with cow's milk, but this is a much lower priced product. Buffalo mozzarella is thus a target for fraudsters, either through mislabelling of cow's milk mozzarella or by partial substitution of buffalo with cow's milk during production.

Because of this potential for fraud, tests that can detect adulteration are needed. To stay ahead of the fraudsters, scientists are constantly working to improve the effectiveness of analytical techniques, as well as making them practical for uptake by the food industry.

Prof Kate Kemsley and her team at the Quadram Institute have developed a new method for testing the authenticity of buffalo mozzarella. This work was carried out as part of the FoodIntegrity project, funded by the EU's Seventh Framework Programme for research and technological development. The Quadram Institute receives strategic funding from the Biotechnology and Biological Sciences Research Council (BBSRC).

The test is based on detecting slight differences between the 'same' protein from different species. It uses mass spectrometry, which allows very accurate measurement of the mass of molecules. Both buffalo and cow's milk and cheese contain a protein called α s1-Casein, which differs between species by just 10 (out of >200) amino acids. These are the building blocks that make up proteins.


During sample preparation, the protein is broken down by an enzyme into shorter sequences of amino acids, called 'peptides'. The analytical test homes in on several distinctive 'marker' peptides which, due to the amino acid sequence differences, are characteristic of either buffalo or cow. Using multiple reaction monitoring mass spectrometry (MRM MS), the marker peptides are selected by their masses, fragmented further, and the individual fragments also analysed. This provides a high level of sensitivity and specificity. Relative quantities of each in a mixture can also be measured accurately.

Prof Kemsley and her team used their method to carry out a small survey of retail mozzarella products. Eight samples of supermarket cheeses specifically labelled as buffalo were all found to be 100% buffalo. Five other samples, simply labelled mozzarella, were all 100% cow. These samples showed no signs of adulteration.

However, when the scientists analysed other products labelled as containing buffalo mozzarella, a number were shown to be suspicious. Two-thirds of supermarket pizzas, restaurant pizzas and other restaurant dishes that claimed to be buffalo mozzarella contained at least some cow's milk. In some, the mozzarella was 100% derived from cow.

The survey was primarily intended to assess the usefulness of the method for analysing real-world samples, including cooked, multi-ingredient products, but it has also raised concerns about the prevalence of species mislabelling. Consumers aren't the only victims of this type of substitution. For most products, buffalo mozzarella is added as discrete pieces, so if it contains milk from mixed animal sources, then the adulteration is likely to have happened earlier in the supply chain. This means that the restaurants or supermarkets are also victims; possibly even the cheese producers themselves, if they are being unwittingly supplied with pooled milk from undeclared sources.

"The scale and complexity of modern food supply chains means that they are increasingly vulnerable to fraud," Prof Kemsley said. "We're hoping that by harnessing the latest technologies we can help to monitor and uncover food mislabelling, but it will need a concerted effort from across the industry and regulators to really tackle authenticity problems like this in the food sector."

Publication: Y Gunning, L K W Fong, A D Watson, M Philo, E K Kemsley, "Quantitative Authenticity Testing of Buffalo Mozzarella via α s1-Casein Using Multiple Reaction Monitoring Mass Spectrometry", *Food Control* 2019 doi: 10.1016/j.food-cont.2019.02.029. 

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Touch-screen viscometer

The Anton Paar ViscoQC 300 touch-screen rotational viscometer is used for multipoint viscosity determination and analysis. The instrument comes fully assembled ready for immediate start-up and has an intuitive digital levelling function to ensure it's properly aligned, before, during and after measurements.

Depending on the instrument model (L, R or H), 4 L or 6 RH spindles are included as standard. Each

spindle is equipped with magnetic coupling to ensure easy one-handed exchange, and is designed to eliminate damage to spindle threads and the instruments' bearings. Automatic spindle detection by Toolmaster prevents manual spindle selection errors, while a built-in automatic guard detection documents whether a spindle guard is attached or not.

Developed for a wide range of applications, the instrument is designed to ensure quality of the measured substance — from almost any fluid to semi-solid samples — by delivering fully traceable viscosity results. Predefined modes/methods on the intuitive 7" colour touch-screen make operation convenient. ViscoQC is equipped with the TruMode, which helps save time when measuring unknown samples.

The internal data storage is capable of storing up to 999 measurement results, which can be exported directly from the instruments' data memory as pdf/csv to a USB storage device or via data collection software V-Collect to a PC. Furthermore, measured data can be printed with a page printer (USB or Network) or a USB label printer. Automatic printout directly after measurement is also an option.

ViscoQC 300 is upgradeable with compliance (21 CFR Part 11) and/or additional analysis software. The compliance software V-Comply adds features such as audit trail, electronic signature, increased security functions and more.

Anton Paar Australia Pty Ltd

www.anton-paar.com/au-en



Toxicology testing software

Synbiosis has introduced its next-generation Ames software module featuring a time-saving mutagenicity ratio calculation function. Designed for integrated use with the ProtoCOL 3 colony counter, the software facilitates rapid production of consistent count and ratio data from Ames test plates and is suitable for use in regulated toxicology testing laboratories.

The software enables ProtoCOL 3 to quickly count *Salmonella typhimurium* or *E. coli* colonies cultured on, for example, Vogel-Bonner medium before and after exposure to potentially toxic or non-toxic control compounds. The software can then automatically compare the different colony counts to generate a mutagenicity ratio, providing a quick guide to the mutagenic potential of a test chemical. This saves microbiologists time and effort with transferring count data to statistical software or manually calculating the ratio. It means ratio results are objective as they are not dependent on the scientist performing the tasks.

As well as numerical data, the software also produces full-colour images of test plates which can be stored in a secure SQL database for reference and another count, if required. Count and ratio data can be automatically downloaded to a spreadsheet or LIMS, thus eliminating data transfer errors, to generate reproducible, traceable results that are consistent from one microbiologist to another.

Featuring user access levels and a full audit trail with user login and logout records, the software is GLP compliant and can be used in a 21 CFR Part 11 environment. The archived results are suitable for generating high-quality reports for audit by regulatory authorities, making the software appropriate for use in pharmaceutical toxicology testing and other regulated microbiology laboratories.

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what's new in
Food
technology & manufacturing

processing

A photograph of Professor Sagadevan Mundree, a man with glasses and a blue striped shirt, smiling and holding a small green plant. He is in a greenhouse with many other plants in the background.

Professor Sagadevan Mundree will lead a foundation project with the CRC.

QUT focus on Future Food Systems

QUT researchers will play a key role in developing smart logistics to link growers with their markets and high-tech methods of growing customised food, with the announcement of the Future Food Systems Cooperative Research Centre.

The aim of the Future Food Systems CRC is to develop important new technologies, products and services that help solve major economic, environmental and social challenges facing Australia. "This CRC will work across the food supply chain and incorporate innovations in protected cropping, advanced manufacturing, smart logistics and food science to underpin high-value industries in agrifood hubs," said Minister for Industry, Science and Technology Karen Andrews when she announced the CRC in March 2019.

Involving more than 50 commercial and research partners, the federal government will inject \$35 million into the CRC over 10 years along with almost \$150 million in support from the research centre's educational and commercial participants.

QUT's involvement in the CRC is spread across the centre's three research and development programs of planning and logistics in linking growers to their markets, developing smart automated indoor cropping and creating nutrient-dense foods and hybrid food and medical goods tailored to growing domestic and export markets.

Professor Doug Baker will lead the research program into logistics and urban design that will identify planning policy, design and infrastructure for integrating high-tech growing and processing facilities, particularly around transport hubs and in regional centres.

"It's about being smarter with agriculture and infrastructure, and integrating technology and robotics into that," Professor Baker said.

"Working with local and state governments and our logistics partners, our planning templates and freight modelling tools will assist food hubs around Australia as they develop sustainable production and supply solutions."

For example, greenhouses with automated vertical farming used to grow crops on or near airports or port areas, so that the crops could be shipped straight to their markets.

The CRC will look at food hubs around Australia including the new Western Sydney International (Nancy-Bird Walton) Airport, which will have a surrounding cluster of intensive agribusinesses creating high-value products for target markets in Asia.

Professor Sagadevan Mundree, Director of QUT's Centre for Tropical Crops and Biocommodities, and Dr Chris Lehnert, a robotics researcher with the Australian Centre for Robotic Vision headquartered at QUT, will also lead foundation projects with the CRC.

Professor Mundree said the researchers would be using smart agricultural technologies to develop enhanced-proteins foods and develop scientifically based tools and methods to create unique Australian-made premium food goods for domestic and export markets.

Professor Mundree will be working with a range of commercial partners including partners such as Greenbio Group Pty Ltd, which will partner in projects in robotics and automation, optimisation and development of novel hydroponic vertical systems, and new crop varieties for vertical systems.

Dr Lehnert will be working on developing robotics and smart technology for vertical and indoor protected cropping.

"The future potential of robotics in indoor protected cropping will be their ability to intelligently sense, think and act in order to reduce production costs and maximise output value in terms of crop yield and quality," Dr Lehnert said.

"Robotics taking action, such as autonomous harvesting within indoor protected cropping, will be a game changer for growers who are struggling to reduce their production costs."

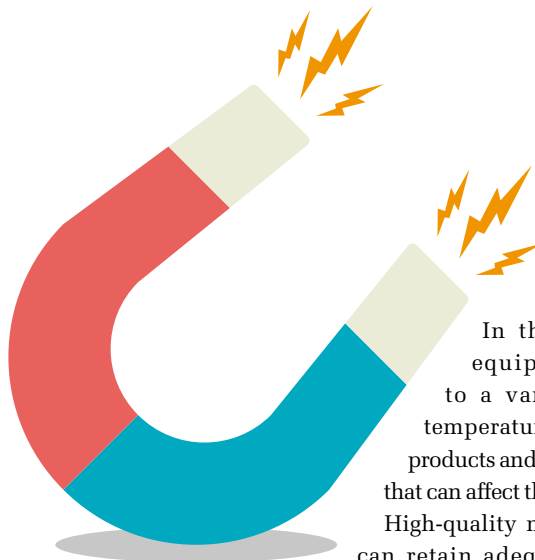
The CRC was initiated by NSW Farmers Association on behalf of the national representative farm sector and as part of a broader industry-wide push to increase value-adding capability, product differentiation and responsiveness to consumer preferences.



QUT
www.qut.edu.au

Causes of demagnetisation in magnetic separators

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In the food industry, equipment is exposed to a variety of different temperatures, environments, products and other circumstances that can affect the magnet's strength.

High-quality magnetic separators can retain adequate strength and effectiveness for many years; however,

low-quality cheap systems can lose their strength rapidly — despite being 10,000 gauss or higher upon supply. Loss of magnetic strength is referred to as 'demagnetisation'. One question that is frequently asked, is 'can magnets regain their strength?' The answer to this question can vary.

If magnets are heated, some magnetic strength loss will occur. This is temporary up to the maximum operating temperature of the magnetic material. Below this, the original magnetic strength is restored provided thermal shock is not experienced. If magnets are heated above their maximum operating temperature, permanent partial loss occurs — which requires re-magnetising to restore. If a magnet is heated beyond its Curie point, the magnet is completely demagnetised.

It is inevitable that magnetic separators will lose their strength over time; however, not all systems will demagnetise at the same rate. There is no way of knowing when, or by how much, a magnet will decline in strength.

Contributing factors which may cause magnet strength loss include:

- Low-cost inferior rare earth magnet elements.
- Settling in strength loss. This is usually 5–7% in the first 6 months for high-grade magnets.
- Poor quality manufacturing procedures, including welding.
- Oxygen and moisture absorption, corrosion.
- Magnet damage resulting from mishandling, impact or excessive vibration.
- Magnet wear from abrasive product types and/or high-tonnage lines.
- Operating temperatures and thermal shock.

To explore these factors in further detail and learn how you can guard against magnet strength loss, download the Magnattack whitepaper 'Contributing Factors to the Demagnetization of Food-Grade Magnet Separators' at <https://www.magnattackglobal.com/demagnetisation>.

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APS Industrial is now offering the Siemens SIRIUS ACT range of push-buttons and signalling devices. These high-performance push-buttons, indicator lights and switches offer style, intelligence and durability and a snap-on concept that makes the task of installing a unit easier.

The range maintains its durability and reliability when dust or water under high pressure are involved. Oils, caustic solutions and extreme environmental influences cannot disrupt reliable operation.

The various communication interfacing options provided by the range enable simple combinations of push-buttons and signalling devices, HMI touch screens and industrial PCs. This means that complex input stations can be set up without extensive wiring and engineering time and effort.

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Disposable gloves

The Microlite PLUS Nitrile disposable gloves feature Easy On glove film treatment technology. They are suitable for people who work in wet, damp, humid, dry or stressful conditions where traditional gloves are hard to put on.

The gloves are used in food manufacturing processes, food safety procedures, waste management, cleaning, food production and busy hospitality environments.

They are efficient and time-saving as they only take a couple of seconds to put on, as opposed to normal gloves that can get stuck on the user's skin.

The comfortable, lightweight and fully textured gloves are Food Safe with FDA approval and they are HACCP Food Safety Certified. They are latex-, powder-, vinyl- and MB- free.

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The corrugated-tube technology in its wide range of tubular heat exchangers improves product flow and minimises fouling — increasing thermal efficiency which results in smaller equipment footprint, reduced cleaning and maintenance requirements and greater energy efficiency. When combined, these deliver economic benefits over the operational life of the units.

Although the company has a range of standard designs which are optimised for different uses and industry sectors, no two installations are the same, and so each heat exchanger is individually designed and built to meet the client's specifications. This often means a full turnkey solution including additional equipment such as pumps, concentrators and aseptic fillers, all of which it produces.

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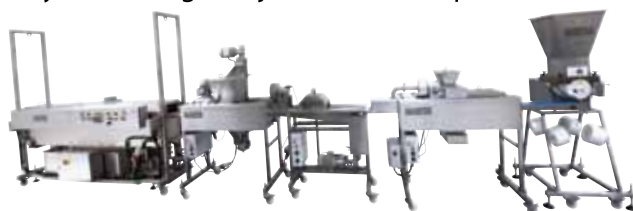
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Emerging dairy trends in 2019

Dustin Boughton, Maxum Foods



Image supplied by Maxum Foods

High-fat dairy is in and low-fat is old news. However, today's consumer expects more bang for their dairy buck, which has driven significant innovation in this category.

Some of the top dairy trends that will be hitting the menus and dairy aisles this year include:

Gourmet flavoured butter

It's not 'just' butter anymore, flavoured butters will really gain momentum in 2019. We're not talking about the 'brown butter' trend, that's yesterday's news... Think sweet and savoury flavoured butters such as honey, pistachio, jalapeno, lemon zest, pumpkin seed and even seaweed flavoured butters! Chefs have been taking butter to new flavour places for a while now but in 2019 we'll see food companies answering consumer demands and providing packaged flavoured butters sold at retail for convenience.

Would you like some cheese with your coffee?


Believe it or not that's what you will be hearing in coffee shops around the nation this year. First it was butter coffee, commonly referred to as 'bulletproof coffee', and now cheese coffee is the latest fad which baristas all over the world are catching on to. Cheese in coffee has a similar texture to marshmallows in hot chocolate, the cubes of cheese float to the top and absorb the coffee developing a squeaky texture.

It doesn't stop there though; cheese tea is also a trend which we expect will become mainstream by the end of the year. The cheese tea trend started in Asia, then moved to the United States and will finally hit Aussie shores in a big way this year. Cheese tea is usually served with either

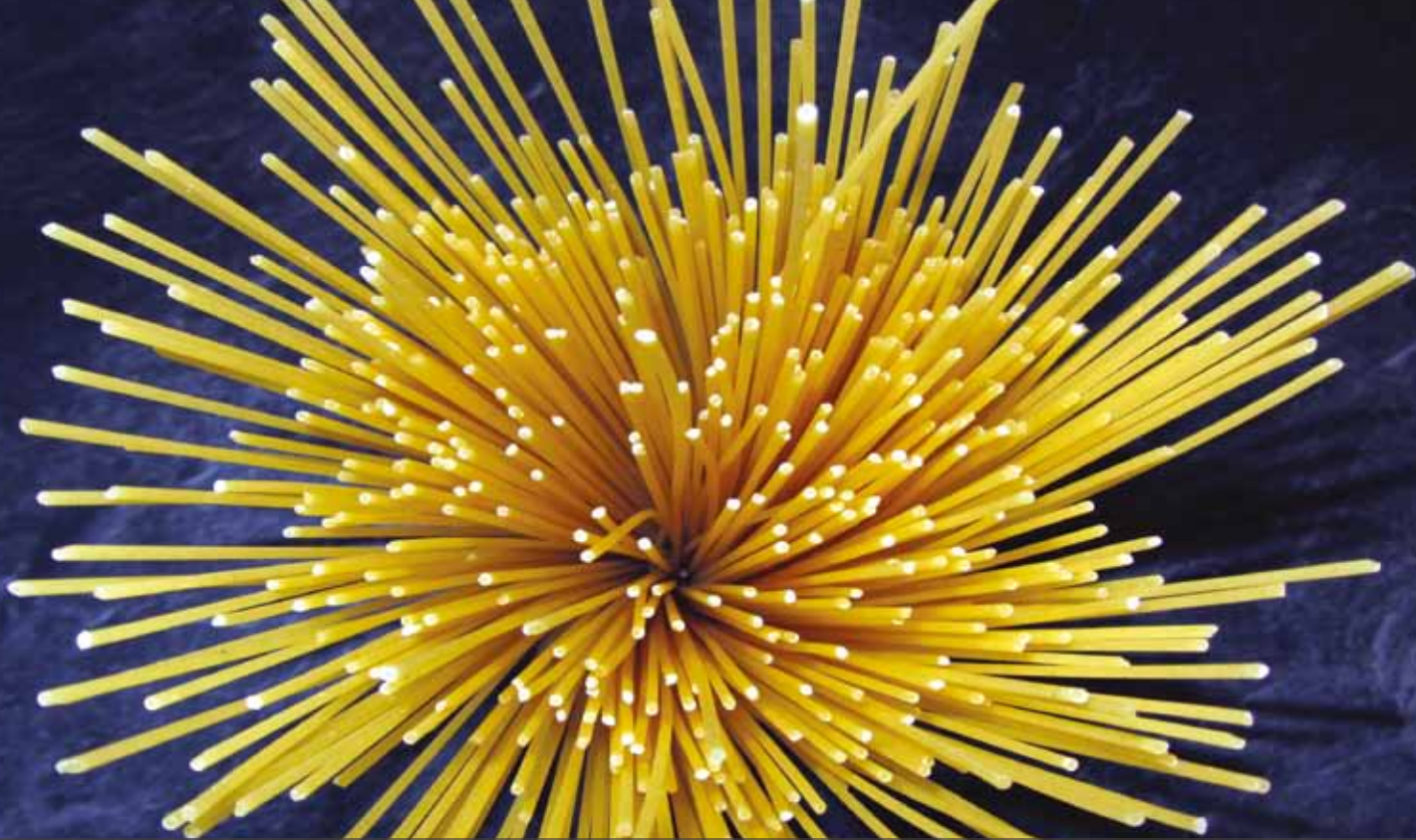
green or black tea and topped with a thick layer of salted cream cheese. As the cheese melts on top it forms a similar texture to melted ice-cream with a salty tang.

Protein, protein, protein

The protein trend has taken many food categories by storm, but we believe the dairy category presents numerous opportunities to satisfy these protein-savvy customers. Once just a trend amongst the health-obsessed millennials, this trend has extended to families with children as well as senior couples who are also putting high-protein foods into their shopping trolleys. We're now seeing high-protein yoghurts, ice-cream and convenient snack products which fit into the 'on-the-go lifestyle' of so many consumers these days. New dairy proteins make formulating protein-fortified products even easier. We're now seeing a completely new category for protein emerging because a form of whey protein which can function in clear beverages is now available.

Consequently, 'Protein Waters' is a category which is growing at a rapid rate. Furthermore, consumers are becoming more aware of the importance of gut health and the benefits of the fermentation process. Nutritional ingredient companies have been quick to respond to this trend and are now offering a whey protein isolate with prebiotic-promoting properties, tapping into the interest in the gut microbiome. 

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The Advantech SPC-1881WP is an 18.5" widescreen multi-touch stationary panel PC with an Intel Core i3-4010U 1.70 GHz processor.

Featuring a slender aluminium casing, the SPC-1881WP provides all-around IP65 protection displaying good mechanical stability and reliability. With M12 connectors and an integrated VESA connector, it can withstand high water pressure from cleaning and offers a high level of waterproofing in humid environments.

The SPC-1881WP is suitable for the food and beverage industry and chemical manufacturing where frequent cleaning is a necessity, as the PC itself (and its connectors) are protected against dust and water to enable them to survive the rigours of jet washing and scrubbing.

Other features include a wide screen with a ratio of 16:9, providing 40% more screen area than 4:3 displays. Furthermore, with the addition of multi-touch capabilities, the device provides greater control and viewing of SCADA information. The Intel Core i3-4010U 1.70 GHz processor with independent graphical processing unit provides support for Windows 10 and DirectX11 so it can handle more complicated and detailed graphics.

Advantech Australia Pty Ltd

www.advantech.net.au



Rotary moulder for soft dough biscuits and sandwich cookies

Baker Perkins' Series3 rotary moulder for soft dough biscuits and sandwich cookies is designed for consistency at high outputs in environments where control of size, weight and texture are essential. A range of adjustments is available to help ensure that products — ranging in thickness and size — can be produced accurately.

Fine-tuning of the dough piece weight is achieved by altering the position of the knife that scrapes the surface of the roll to ensure cavities are evenly filled. As it moves round the roll, the mechanism ensures that it stays tangential to the roll surface.

Adding the refinement of a new 'park' location for the scraper knife gives easier access, so that changing both knife and moulding/die roll is simple and quick.

Throughout the machine, chains have been replaced by direct drive, eliminating a potential hygiene and maintenance problem. The gear drive to the rotary moulder has also been removed; it is now clutch driven, eliminating grease and exposure to teeth, achieving safer, cleaner and quieter operation.

It is compatible with Series2 machines, so rolls can be re-utilised.

The rotary moulder retains the independent drives and adjustments which sustain performance and weight control through setting and maintenance of critical parameters such as roll and web speed, forcing roll gap, scraper position and web tension.



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The heavy-duty, Low Flow Hose Nozzle from Tecpro Australia is designed to balance industry hygiene standards with water efficiency. Based on the heavy-duty hose nozzle design, the low-flow model has the same tough, robust construction and high-impact cohesive water jet, yet has a lower flow rate making it suitable for

use on 1/2" washdown hoses. The standard hose nozzle is designed to be used on 3/4" and 1" washdown hoses. The smaller, lighter hose immediately cuts weight making it less strenuous for cleaning teams to move around during washdowns.

The nozzle features a simple, twist head which some users find more comfortable than the usual trigger guns. It has an adjustable spray pattern that can handle a maximum water pressure of 16 bar (232 psi). Having a tough rubber cover and high temperature components, it is capable of being used at temperatures of up to 80°C.

To allow instant distinction between hot- and cold-water hoses, the nozzle is available with either red and blue covers. An all-white nozzle cover is also available for industries such as dairy and pharmaceutical.

Other features include replaceable EPDM rubber cover and Teflon seals.

Tecpro Australia

www.tecpro.com.au

Stainless steel vibrators

Although industrial vibrators used in various machines in the food industry do not come into direct contact with food or ingredients, the chemicals used in washing down equipment can have deleterious effects on steel and aluminium. NetterVibration has overcome this problem by producing many of its vibrators in stainless steel. Electric and pneumatic models are available.

Additionally, many are also available in ATEX Zone 21 and 22 rating, suitable for dust explosive atmospheres, such as flour and sugar.

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Considerations for detecting needles and wire in food for improved safety

Ensuring produce is free from small foreign objects requires several considerations:

1. Physical characteristics of foreign object
2. Cause of entry of contaminant
3. Location of the foreign object in the inspected product.

All three have implications for ensuring that foreign objects are detected and eliminated in the supply chain before reaching the end user.

Metal detection and/or X-ray inspection are two of the most common technologies used to find foreign objects in food. Each technology should be considered independently and based upon the specific application.

Metal slivers, needles and wires — such as those found in the recent contamination events — are challenging to find with conventional inspection practices because of their variable size, thin shape, material composition, numerous possible orientations in a package and their light density.

National food safety guidelines (such as FSANZ, FDA) provide guidance in preparing the most robust solution for a particular environment. It's the quality team's job to then consider the type of inspection system to use, either metal detection or X-ray inspection, based on the types of foreign materials possible to enter the process.

Metal detection

Metal detection is based on disruption of an electromagnetic field at a specific frequency within a stainless steel case. Any interference or imbalance in the signal is detected as a metal contaminant. Most food products have their own response to this field which must be adjusted, to prevent false positive. Hot, wet, conductive products have more inherent signal than dry non-conductive products which impact the detection capabilities of the machine.

Factors to consider when evaluating metal detectors:

1. Metal types, no single best frequency for detection of a specific metal.
2. External environmental noise (Motors, vibration & RF interference) can also spike resulting in false rejects or reduced sensitivity the detector.

3. Size of product/aperture of metal detector.

The detector head size also impacts detection capability since the further the metal gets from the coils, the more difficult it is to detect small metals.

4. Product noise can also have a significant impact on detection of metal. All products and metals have a phase angle which, in some cases, can overlap and conceal the metal from being detected. To address this, food processors could install two detectors at 45° angles from each other or use one multiscan detectors with many frequencies running at a time to decrease the effect of product noise.

X-ray inspection

X-ray inspection is a density based optical detection system, so it can be used to identify metallic and non-metallic contaminants. The X-ray beams are passed through the product and an image is collected on a detector. The average gray level of the product is learned as the standard and any areas that are denser (or darker) would be detected as a foreign material by the system.

Factors to consider when evaluating X-ray inspection:

1. Physical characteristic of product: homogeneity, physical size of product. In general, items that float in water are not detectable by X-ray systems, such as wood, hair, insects, most plastics and rubber. Aluminum, thin, flat metal, slivers, needles and wires may not have enough density to be seen through the product when perpendicular to the X-ray beam, creating an orientation effect. In that case the diameter of the metal must be large enough to cover the majority of a diode in order to be detected.
2. Physical characteristic of the foreign object: photodiode size, density of the foreign material (denser) in relation to product being inspected.
3. Robustness of the software to detect changes in foreign material. Non-homogeneous products cause problems because the sensitivity must be set for

the densest portion of the product, not the thinnest area. This often means larger contaminants are detected in these products. In this case it's important to use as many software filters as possible to find objects based on density, shape and size.

Even with a better understanding of each technology from this discussion, you still may not know which technology to select. Yet either metal detector or X-ray inspection is a prudent investment versus no inspection technology.

- Our recommendation for metal detection is the Thermo Scientific™ Sentinel 5000 metal detector with multiscan technology. This system uses 5 frequencies simultaneously to increase the probability of detecting all metals, including slivers, needles and wire of varying sizes, in different orientation and with different compositions. Typically these systems last 10–20 years depending on the environment.
- The Thermo Scientific NextGuard C330 system is the best solution for X-ray inspection. This is an entry-level system built specifically for retail packages. It is simple to operate, cost effective and will last approximately 5–8 years.
- Another option is bulk inspection of the raw fruit directly from the field using either a metal detector or a Thermo Scientific Xpert B600 X-ray inspection system. Running fresh fruit in a single layer through a smaller metal detector aperture will increase the detection capabilities because the product will be closer to the coils. Inspection with an X-ray system will also be improved because the product will appear more uniform in the image, making detection of foreign materials easier. Find out more at thermofisher.com.au/productinspection.

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APLEX Technology's FABS-9XXA Series of Food Safety Grade Stainless Steel HMIs are aimed at improving the safety and productivity of the food and beverage processing industry.

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The HMIs are designed to meet EN1672-2 hygiene requirements. Their front panel has an edge design which is formulated to allow water flow through the charmed edge while preventing water seepage into the inner structure of the panel PC for easy and comprehensive cleaning. The adhesive materials used for edge lamination and the HMI's sealing sponge meet FDA 21 CFR 177.2600 for food safety assurance, and the touch glass is tested by the SGS group.



The HMIs are panel-mountable and can be easily installed in facilities or equipment. They are equipped with strong communication networks and I/O expansion capabilities, capable of conforming to specific customer requirements while giving good connectivity and integration.

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The product features torques, simple operation and commissioning, and is available for a range of applications. It can be used in packaging, logistics, food and beverage and pump applications.

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Efficient heat use can help cut agricultural emissions

Matt Hale*

Specific information on heat use in Australian agriculture is hard to obtain. While the Australian climate means that artificial heating is rarely required in areas where it is commonly used elsewhere in the world, such as for crop drying and general livestock heating, there are some key segments such as pig and poultry production and greenhouse horticulture where heat use represents a significant proportion of total energy use.

Although it is difficult to break down how Australia's farming sector utilises the 110 PJ of energy it consumes each year,¹ some information is available from industry surveys² which reveals that in certain sectors heat use plays a significant role. For example, 23% of the energy used in Australia's pig supply chain is accounted for in piggeries, and electricity accounts for 75% of this with uses including heating (such as heat lamps and electric heat pads) and ventilation. For broiler chicken, egg and hatching facilities, heating is also a key energy cost, with electricity, diesel and LPG being among the main energy sources used. Although energy use in the horticultural sector is currently dominated by cold-chain handling and irrigation, "protected cropping and greenhouse production is one of the fastest growing food-producing sectors in Australia",² and heating is a key energy requirement in these systems.

Decarbonising heat on farms

Agricultural and horticultural businesses around the world have made great strides to reduce their greenhouse gas (GHG) emissions, but energy consumption by Australian agriculture is rising.¹ Heat has been one of the key targets for decarbonising farming in many countries, particularly in Europe. According to the UK government, in 2015 the UK's agricultural sector accounted for 10% of total UK emissions, a fall of 17% since 1990. And at the forefront of decreasing agricultural GHGs in recent years is heat. CO₂ emissions from agricultural and horticultural heating in the UK have fallen over the last decade, largely due to the adoption of biomass boilers, improved system efficiencies and the rise of anaerobic digestion (AD) on farms.

For example, there are now more than 270 dedicated on-farm AD plants in the UK, converting slurries, manures and crops into biogas and biofertiliser. This biogas can then be converted into renewable electricity, biomethane gas or, of course, heat. An additional benefit of AD plants is that they also produce incidental heat, which can be captured and used within the AD process or for other on-site operations. There are multiple benefits to farmers of installing an AD plant — not least the opportunity to reduce direct and indirect GHG emissions through improved waste management and the generation of renewable

energy. Maximising the use of 'green' heat can bring even more rewards, helping to cut agricultural emissions and bring down on-farm heating costs.

Using heat exchangers

There are many uses for heat on farms, but getting this heat from one part of the process to another easily and quickly is essential if the benefits of renewable heat are to be maximised and agricultural emissions curtailed. This is where heat exchangers come in. Heat exchangers take heat from one process or place and transfer it to another. In practice, they allow the heat from a liquid or gas to pass to another liquid or gas without the two having to come into direct contact.

Two of the most common types are plate heat exchangers and tubular heat exchangers. However, within these broad categories there are many different models and refinements, and it is important to understand what is being offered. It is important to compare running costs, including maintenance and cleaning, over the full life of the plant — downtime caused by regular dismantling or cleaning can quickly eat into any capital savings made at the time of purchase.

Whatever the source of heat — biomass boiler, AD plant or other technology — efficiently transferring and using the generated heat is a vital part of making sure the overall system works as intended and keeping running costs to a minimum. Whether you are transferring boiler heat to a storage tank in a greenhouse or taking heat from a biomass boiler to the drying fans in a grain store, it is important that the right kind of heat exchanger has been specified and that it is suitably maintained. For example, plate heat exchangers can easily become clogged with dust and dirt if not regularly cleaned, severely reducing their effectiveness and requiring more fuel and time to dry the same quantity of grain.

References

1. Australian Energy Update, 2017: <https://www.energy.gov.au/sites/default/files/energy-update-report-2017.pdf>.
2. The impacts of energy costs on the Australian agricultural sector. Australian Farm Institute, 2018: <https://farminstitute.worldsecuresystems.com/LiteratureRetrieve.aspx?ID=163636>.

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Trade deal a win for Aussie vegetable growers

Australia has signed a new trade deal with Indonesia which will help local carrot and potato growers looking to export into this growing market.

The Indonesia-Australia Comprehensive Economic Partnership Agreement (IA-CEPA) aims improve two-way trade between the two countries, and will decrease tariffs placed on a range of exported Australian goods.

Indonesia has a population of 270 million and is expected to have the world's fifth-largest economy by 2030. Australia will be able to benefit from the country's economic growth.

"Under the agreement, producers of grains, live cattle and meat, dairy and horticulture, and many other products, will benefit from lower tariffs and improved access to Indonesian markets," explained a joint media release from Prime Minister Scott Morrison and Trade Minister Simon Birmingham.

Some of the key IA-CEPA outcomes for the vegetable industry are:

- Carrots — Increased import quota of 5000 t per year, growing to 10,000 t per year after 10 years, with a decreasing tariff schedule during this time.
- Potatoes — Increased import quota of 10,000 t per year, growing to 12,500 t per year after five years, with a decreasing tariff schedule during this time.

AUSVEG CEO James Whiteside said carrots and potatoes exports are two of the Australian vegetable industry's key export crops, and the agreement should lead to an immediate increase in the trade of these commodities to Indonesia.

It will help the vegetable industry meet its goal of increasing its export value to \$315 million per year by 2020, an increase of 40% from 2016.

"Trade agreements with neighbouring countries such as the IA-CEPA help provide our industry with confidence that it can continue to prosper through developing export markets, which helps secure the profitability and competitiveness of the Australian vegetable industry," Whiteside said.



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Mining seafood process water for nutrients

Mia Malmstedt

Process waters from the seafood industry contain valuable nutrients that could be used in food or aquaculture feed. But the process waters are treated as waste. Researchers now show the potential of recycling these nutrients back into the food chain.

During preparation of herring, shrimps and mussels, large amounts of process water are continuously pumped out as waste by the seafood industry. The water is used when boiling shrimps or mussels, or when filleting, salting and marinating herring, for example. Approximately 7000–8000 litres of water is used to prepare a ton of marinated herring. A stunning 50,000 litres of water is needed per ton of peeled shrimps, or per three tons of raw shrimp.

But these side stream waters contain proteins, peptides, fats and micronutrients, which could be recycled and used, for example by the food industry, as an ingredient in feed or for growing microalgae. In fact, the leftover boiled water from shrimp preparation is basically a ready-made stock.

Nutrients could be recycled

The Nordic project NoVAqua, coordinated by Professor Ingrid Undeland of the Department of Biology and Biological Engineering at Chalmers University of Technology in Sweden, has now shown the potential of extracting these important nutrients from the process waters.

“It’s very important to help the industry understand that the side streams don’t need to be wasted. Instead, they should be treated as really exciting raw material,” she said.

“The backbone of our project is a circular approach. In the past, we had a more holistic view on handling of food raw materials, but today so much is lost in side streams. Furthermore, we are in the middle of a protein shift, and there’s a huge demand in society for alternative protein sources.”

The research project started in 2015 with the aim to recover nutrients

from seafood process waters and create innovative uses for them. A similar approach is already successfully implemented in the dairy industry, where the residual liquid from cheese making — whey — is used in sports nutrition, as well as in different food and feed products.

Much of the protein is lost

When the research team measured the composition of process waters, they found them to contain up to 7% protein and 2.5% fat. In process waters from shrimp, astaxanthin, a red pigment and antioxidant often used as a dietary supplement was also present.

“Our calculations show that in a primary processing plant for herring, as much as 15% of the herring protein coming in to the industry leached out into the water and was treated as waste, thereby lost,” Prof Undeland explained.

Using a two-step process, the research team managed to recover up to 98% of the protein and 99% of the omega 3-rich fats. The process resulted in a semi-solid biomass and a nutrient-rich liquid. After dehydration, biomass from shrimp boiling water was shown to contain 66% protein and 25% fat. Two tests were made, together with the University of Gothenburg and Skretting ARC, using this new biomass as an ingredient in feed for salmon, and the results were encouraging.

The nutritious liquid was used for glazing frozen fish, thereby protecting it from going rancid. It turned out to be slightly more protective than water, which is currently used for such glazing. The fluid was also tested as a substance for microalgae cultivation and was shown to enhance the growth of two types of algae. The algae biomasses can subsequently be used as sources of protein or pigment.



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A need for investment

All in all, the research project pointed out several different ways to recycle the nutrients which are currently lost in the process waters. The next step is implementation in the seafood industry.

“A major challenge is to get the industry to manage the water side streams as food, beyond the stage when they are separated from the seafood product. Today, that is the point where the side streams start being handled as waste. This means there’s a need for new routines for cooling and hygiene,” Prof Undeland said.

In Sweden, the waste waters are purified to some extent before they go out of the factories. This means that many seafood producers already have the flotation technology needed in the second step of side stream recycling. But there are also investments to be made, said Bitu Forghani Targhi, a postdoctoral researcher at the division of Food and Nutrition Science and colleague to Undeland.

“The main challenge would be cost-related issues,” she said.

The start of a new project

The work now continues within the new project AquaStream, funded by the European Maritime and Fisheries Fund. Bitu Forghani Targhi points out that an important next step will include consulting with local businesses, interviewing them on generated side streams and verifying the current nutrient loss through a primary characterisation of process waters. She has a positive outlook on the future:

“I am quite positive on the fact that related industries, sooner or later, will be implementing these techniques. With ever-increasing awareness on the value of recycling nutrients, this facilitates industrial processes to adopt feasible approaches towards a circular economy.” 🐮

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As an optional accessory, stainless steel swivel wall brackets are also available, which can help make coolroom cleaning more efficient because the hose is easier to manage. The brackets are designed to fit neatly and easily onto the plates.

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The Rotary Dryer Roaster (RDR) from Heat and Control is designed to provide snack food operators with a complete end-to-end solution for the dry roasting of nut and seed products.

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The unit provides operators with complete control to dry or roast in a continuous, gentle and sanitary manner with optimal quality and uniform results.

Along with nut products, the RDR is also suitable for applications such as the drying of meats and poultry to create jerky and meat chips, as well as drying pet products to create food and treats.

Heat and Control provides a complete range of snack line capabilities for seasoned and coated nut snacks, including frying, dryer/roasting, seasoning, coating, conveying, weighing, packaging, case packing, inspection and controls.

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Swiss bakery optimises operations with vacuum cooling system

Uli Merkle*

Fleur de Pains, a medium-sized bakery and patisserie in western Switzerland, values high-quality baked goods and patisserie and confectionery products.

All goods sold at Fleur de Pains' 21 shops are handmade in Crissier, near Lausanne, using traditional methods. In addition to this craftsmanship, the consistent high quality of the baked goods is made possible by modern vacuum cooling, which rapidly cools the products after they are baked, preparing them for further processing or sale.

To guarantee quality, Managing Director Stéphane Simon repeatedly tested and changed the manufacturing process. The most difficult aspect was creating a firm bread crust and consistent texture of rolls and croissants on humid days.

Swiss company Aston Foods implemented a vacuum cooling system to improve quality and reduce cooling time after baking. The vacuum chamber is connected to a vacuum pump located in a separate room and is designed to accommodate a manually loaded transport rack. Baked goods are placed in the vacuum chamber immediately after baking where they are cooled to 30–35°C within one to three min.

After cooling, the goods can be removed and eaten almost immediately or processed further. The customers praised the bread crust, its refined colour and more homogeneous formation of pores, and the associated greater volume.

The principle of vacuum cooling baked goods has been well known for decades but could not be technically implemented in a satisfactory way. Working closely with Busch, Aston Foods optimised the vacuum cooling process by incorporating Busch's dry COBRA screw vacuum pumps into its cooling systems.



The contact-free screw profile of the COBRA vacuum pump enables an oil-free vacuum.

Unlike oil-lubricated rotary vane vacuum pumps, which were often used while vacuum cooling systems were first being developed, COBRA vacuum pumps operate without the need for oil or other operating fluid in the compression chamber. This means that water vapour, which can be sucked into the system during the cooling process, cannot mix with any operating fluids and condense in the vacuum pump in the process. The high pumping speed of the vacuum pump in the low pressure range makes it possible to set up the vacuum pump 20 m from the actual vacuum chamber in an adjacent room.

Due to the elimination of oil, and thus the risk of forming an emulsion with the condensate, all maintenance work required for oil-lubricated vacuum pumps, such as regular oil and filter changes, becomes unnecessary.

Aston Foods CEO Christian Vetterli confirmed that the yearly maintenance effort for the system only takes two to four hours and, although the system at Fleur de Pains operates for two shifts six working days per week every year, the only maintenance the vacuum pump requires is cleaning the inlet filter and exchanging the gear oil.

For Fleur de Pains, converting to a vacuum cooling system has brought further advantages: the time for baked goods to cool has reduced from several hours to one to two min, depending on the product. During conventional cooling, baked goods are exposed to various environmental influences like humidity and ambient temperature, which have an uncontrollable influence on quality. With vacuum cooling, the process after baking is precisely fixed and independent of all external conditions.

"The process requirements for vacuum cooling are demanding," said Vetterli, "but thanks to the integrated control and reliable vacuum technology, it is perfectly manageable."

Fleur de Pains installed a total of 150 programs for cooling its various products. In doing so, the exact cooling procedure for each product is individually defined and can be replicated. The programs were finely adjusted during the initial phase and can now be easily started with the press of a button.



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Extruder turns problematic waste into pellets

PROCESSING



Scientists from the VTT Technical Research Centre of Finland have developed a cylindrical extruder that they believe will revolutionise the processing of recyclable materials, turning problematic textiles and plastics as well as food waste into pellets. The first prototype has already exceeded the industrial steering group's expectations during initial testing.

An extruder is a device that is capable of melting, mixing and extruding paste through a shaped nozzle. The plastics industry uses extruders to make, for example, pipes and profiles, and they also have various applications in the food and feed industry. When VTT Research Scientist Hannu Minkinen discovered that materials can rotate around the

device's hollow cylinder, the research centre got to work developing their own version for processing problematic recyclable materials.

"Many textile recycling processes are only suitable for products containing homogeneous fibres. However, textiles are often made of a mix of fibres, and many products are comprised of different layers," said VTT Senior Scientist Pirjo Heikkilä.

"The new extruder opens up a revolutionary opportunity to recycle mixed textiles and materials without having to separate fibres or components. We have successfully tested the device, for example, for recycling pillows without removing the filling in the course of a project called Telaketju with funding from Business Finland."

The diameter of the extruder screw determines the size of the feed throat and also the kinds of materials that the device is capable of processing. The first prototype has a screw diameter of 30 cm, instead of the 3–4 cm typically found in conventional devices of the same output. This large diameter, combined with a shallow screw channel, makes it possible to mix different components of problematic, porous and lightweight materials and to make the mixed mass compatible with the next stage of the production process.

The design enables accurate temperature control combined with efficient mixing and long residence time, particularly considering the size of the device. This can be beneficial when processing materials such as food and feed. Long fibres can also be processed without cutting them, which is useful when processing textiles, for example, or when mixing fibre composites.

VTT's first prototype is less than 2 m long and weighs 1.5 tonnes, making it compact enough to be easily transported and mounted upright if necessary. Due to its simple design, the device is said to be cheaper to make than traditional mixing twin-screw extruders.

Research scientists have been testing the prototype's performance with, for example, pieces of plastic film, mixed plastic waste, various kinds of textiles and bread. In addition to recycling, the device has been used to produce long fibre composites, and it can also be utilised in food and feed processing.

VTT is currently looking for a partner to commercialise the technology. According to VTT Principal Scientist Tomi Erho, "Commercialising the device would create completely new possibilities both in terms of waste processing and novel material combinations."



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Food waste tech wins \$20,000 at evokeAg

Automated technology that reduces industrial food processing waste by 40% was recently recognised at evokeAg, Australia's largest agricultural technology event.

CEO of Christchurch start-up CertusBio Matthew Jones took home the top cash prize of \$20,000 in the Investment Ready Pitch Tent competition at EvokeAg in Melbourne. Jones was one of five finalists from Australia, New Zealand and Israel who pitched their agricultural challenges, solutions and business ideas to a panel of expert venture capitalist judges.

With 2–3% of all processed milk disappearing down the drain, the dairy industry loses NZ\$12.8 billion per year globally, Jones explained. Developed by Lincoln Agritech and commercialised by CertusBio, the technology minimises this type of waste.

"Our solution saves money for processors and helps them meet their social responsibility to safeguard the environment for future generations."

The technology, which can be installed without interruption to existing processes, includes a biosensor device that provides real-time insights into when food is wasted, a dashboard giving company managers unprecedented visibility on losses and a dedicated consultant to optimise food production.

"Other companies have been in the market a long time but do not provide accurate enough information to prevent this type of food waste."

Jones is now seeking an investment of \$2 million to meet the demand of customers in the international dairy industry and grow the CertusBio team. "I'm looking for investors who care about reducing waste using validated technology in the food processing industry," he said.

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Moisture sensor

Bestech Australia offers the Ahlborn FHA 696 GF1 sensors for determining the moisture content in granulated materials. Some examples of the materials include wood chips or pellets, sawdust, cereals and various types of grains. The sensor operates based on the principle of an open plate capacitor. Moisture content in the materials can be determined based on the dielectric constant of the materials.

The FHA696 offers quick determination of moisture content in a matter of seconds. To get an accurate reading, measurements need to be made in the sealed air-tight package filled with approximately 10 L of granulated sample. The readings are compared with the reference data, which is measured on dried samples. These reference values are programmed into the ALMEMO connector for the moisture probe.

This sensor is suitable for measuring the moisture content of hydrophobics material. It can measure from 0 to 99.9% of moisture based on its weight percentage with 0.1% resolution. The FHA696 works in conjunction with other measuring instruments from ALMEMO for data display and monitoring.

Bestech Australia Pty Ltd
www.bestech.com.au

Food-grade panel computer

Interworld Electronics has released the FABS-915AP food-grade stainless steel panel computer. It is housed in a fan-less aluminium enclosure with a 304 or optional 316 grade stainless steel bezel that provides IP66/IP69K front panel protection. Part of the FABS Series, the FABS-915AP has been optimised to meet the hygienic design requirements of DIN EN 1672-2 and DIN 42115, Part 2. These European standards establish high standards for the food and beverage processing equipment.

The panel PC is powered by an Intel 6th/7th generation Core I processor with DDR4 memory. The 15" 1024x768 resolution LCD and 7H anti-scratch highly durable projected capacitive touch screen make it suitable for operator panel and HMI control applications. The standard 420 cd/m² or an optional 1000 cd/m² high brightness screen is available.

The FABS-915AP provides: 2 x COM, 2 x GbE LAN ports, 2 x USB3.0 ports as well as support for internal Mini-PCIe expansion modules. Communication and network options include 3G/4G, Wifi/BT, GPS and RFID. The internal 2.5" SATA3 HDD is easy to access allowing the operating system and data storage to be upgraded at any time.

It supports DC 9~36 V power input and an operating temperature range of 0~50°C. Operating system support includes Windows 10/IoT.

The FABS-915AP is only 54 mm deep. Panel and VESA mounting makes the FAB series convenient to install.

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Feeding cows less protein can save farmers money

Updates to a dairy nutrition model developed at Cornell University may help farmers improve their economic margin and reduce the amount of nitrogen pollution in the environment.

The Cornell Net Carbohydrate and Protein System (CNCPS) is a model that helps farmers determine what to feed dairy cows to make milk production more efficient and environmentally friendly.

On-farm research in Broome, Tioga and Delaware counties in New York revealed that farmers can feed cows less protein, maintain a cow's milk-production output and reduce nitrogen in the manure. This means the nutrient does not run off into waterways and lakes, which can promote unwanted algae.

The researchers used the CNCPS to formulate diets in eight herds of cows in New York, and found that it could reduce nitrogen in manure by about 14%.

On one 50-cow farm, the researchers found the amount of protein in the feed dropped from 16.3% to 14.9%. In the farm's manure output, there were 1607 fewer pounds of nitrogen put into the environment annually with no change in milk production. On a 565-cow farm, the protein feed input dropped 1%, which resulted in nearly 80 g less nitrogen in cow's manure daily and reduced nitrogen excretion by 18.6%. That translates into 35,916 fewer pounds of nitrogen in the environment annually.

The researchers noted that reducing the protein portion of the feed to enhance efficiency also saves farmers money. Using 2017 feed prices as a base, they stated a farmer can save between \$147 and \$157 per cow annually.

"I call it a win-win. The dairy farmers win because the cow is more efficient and more profitable. Society wins because we're now putting fewer nutrients back into the environment or into the water than we would have had we not made the adjustments," said Larry Chase, Professor Emeritus of Animal Science.

The researchers concluded: "The CNCPS can be used to assess the environmental impact of dairy cattle and by nutritionists to improve the utilization efficiency of diets and cattle in the environmental context."

The research was published in the journal *Applied Animal Science*.

This is an edited version of an article originally published on the Cornell Chronicle.

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Sensors could prevent over-fertilisation on farms

A soil-monitoring sensor that mimics the way plants detect nutrients through their roots is being developed by a Queensland University of Technology (QUT) researcher to help farmers reduce their reliance on over-fertilisation.

The device, developed by QUT Advance Queensland Research Fellow Dr Mariam Darestani, could cut the costs of running a farm and reduce the chance of excess fertiliser ending up in food.

Current methods of soil monitoring require samples to be examined in a laboratory, which is costly and labour-intensive, particularly in large-scale agriculture, as nutrient concentration varies at different parts and depths of the soil. As a result, synthetic fertilisers were often over-applied to ensure high yield in the shortest time frame.

“Unused fertiliser accumulates in the soil and turns into chemicals that later end up in our food,” Darestani said. “Fertilisers also end up in water and change the ecosystem and can have a negative impact on the environment.”

Darestani said she aims to build sensors that can give an estimate of nutrients in the soil without taking samples to a laboratory. She was recently awarded \$37,000 by the AMP Foundation to build and test a prototype in the field.

“These sensors can help tackle the over-fertilising issue that threatens soil and water quality and has long-term effects on the environment and human health.

“My device gives farmers a cost-effective way of measuring nutrients in the soil, allowing them to make more informed decisions on how much fertiliser is needed to enhance plant growth.”

Food-safe ball bearings

ABB's Dodge Food Safe mounted ball bearings are designed to withstand caustic, high-pressure cleaning and sanitation processes. They are the first industrial bearings to achieve the IP69 water protection rating without the use of an end cover, the company claims, making them suitable for use in the food and beverage industry where equipment must be aggressively cleaned. They carry a warranty against failure due to water ingress.

The bearings are resilient against cleaning agents. The 100% stainless steel insert design, combined with a KleenTec top coat, offers protection against corrosion. The smooth housing without a grease fitting minimises contamination harbour points and is easy to clean. The bearing is sealed and lubricated for life to minimise maintenance costs.

To prevent grease washout, the bearing is equipped with lubrication protection. The Hydro armor sealing system, with a stainless steel flinger and four contact lip seals, prevents water and con-

tamination from entering the bearing. The company's ball retainer, the Maxlife cage, retains a large volume of grease in compartments around the rolling elements to prevent washout during high-pressure cleaning.

The bearings are available in a variety of housing styles, including pillow block, tapped base, flange and take-ups ranging in sizes from 20 to 50 mm.

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Wastewater treatment for Kraft Heinz's soy sauce plant



Veolia Water Technologies will supply Kraft Heinz China with a wastewater treatment solution for its new soy sauce plant in Guangdong. This will help the food giant meet the stringent national and provincial discharge standards.

Veolia will provide its AnoxKaldnes Biological Activated Sludge (BAS) solution to the Yangjiang food factory, which covers an area of over 13 hectares and will produce about 125,000 tonnes of soy sauce annually.

Designed to provide a volumetric loading capacity that is up to three times higher than conventional activated sludge, the BAS biological wastewater treatment solution is a combination of the company's compact AnoxKaldnes Moving Bed Biofilm Reactor (MBBR) and activated sludge processes. This will allow Kraft Heinz to cope with an overall higher organic load than conventional activated sludge processes, while requiring a relatively small footprint.

The wastewater treatment plant will also be equipped with a dissolved air floatation (DAF) clarifier system for total phosphorous removal and biological sludge separation.

"This project is a testament to the quality of Veolia's wastewater treatment solutions and it reaffirms Veolia's leading position as a water and wastewater solutions provider," said James PENG, Managing Director, Solutions China, Veolia Water Technologies. "By combining our technologies and our knowledge of local discharge limits, Veolia is able to help Kraft Heinz mitigate wastewater challenges in an increasingly environmentally conscious market."

Veolia Water Solutions & Technology
www.veoliawatertechnologies.com.au

packaging & labelling



Recycling

tops packaging trends in 2019

Consumers are increasingly concerned about the environmental impact of plastic packaging, and this is set to continue with Innova Market Insights identifying 'Recyclable by Design' as its top packaging trend for 2019.

It stated that media attention around the environmental issues, combined with widespread bans on single-use plastics and the implementation of China's National Sword policy, made 2018 "a tipping point for the plastic packaging industry".

An alliance between food manufacturers, packaging suppliers and waste management agencies is important in achieving the ambitious circular economy and sustainability goals set forth by governing bodies and businesses in 2019, according to Innova Market Insights. In particular, it highlighted clearer labelling, standardised packaging and increasing the recycled content of products could help encourage higher levels of recycling.

From 2014–2018, there was a strong average annual growth in food and beverage launches with an ethical packaging claim, with Latin America leading with 33%, followed by North America (19%) and Europe (10%). Paper-based and hybrid plastic alternatives are also on the rise, with a 40% increase in new food launches with paper-based packaging (2018 vs 2014).

However, convenience remains key, with new product data revealing the number of food and beverage launches with a recloseable or resealable closure has experienced an average annual growth rate of 92% from 2016–2018.

After Recyclable by Design, other top packaging trends identified by Innova Market

Insights were:

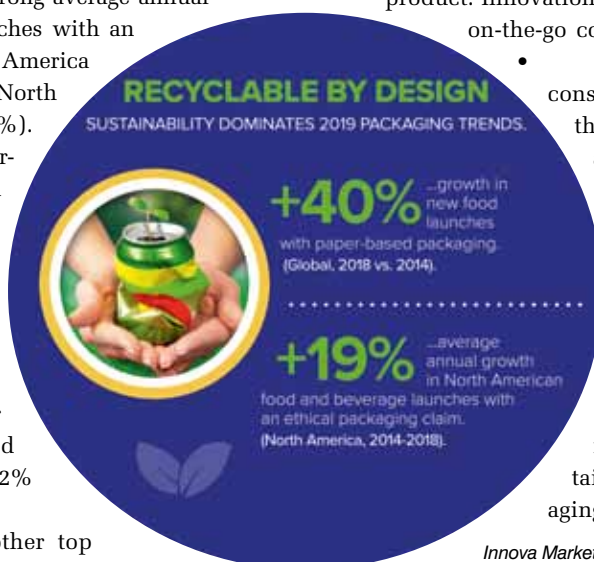
- **E-Commerce Ready:** With more consumers shopping online, the landscape for online retail is rapidly changing. Developing packages that provide product protection and tamper evidence while reducing the environmental impact of shipping materials in the e-commerce supply chain will prove vital.
- **Nature's Appeal:** Anti-plastic sentiment and the rising demand for designed-in recyclability have fuelled a resurgence in paper and paperboard packaging. Paper is renewable, recyclable and compostable, and its 'naturalness' appeals to the increasingly eco-conscious society.
- **More Convenient Convenience:** Consumer convenience continues to be one of the most important attributes to consider while designing the optimal packaging for a product. Innovations within this area focus on facilitating on-the-go consumption and ease-of-use.

- **Pack to the Future:** With increasing consumer demand for transparency along the supply chain, IoT technologies such as QR codes and blockchain have come to the forefront. There has been a rise in the use of near field communication and augmented reality as tools for increasing brand loyalty through consumer engagement.

Finally, the year ahead is expected to see more lightweight packaging, the growth of bioplastics, personalised packaging, more inclusive and tailored packaging, and re-usable packaging.

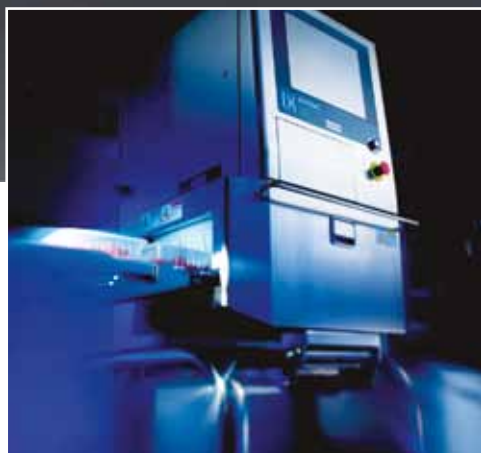


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Brewery safeguards beer quality with glass filler



German brewery Rothaus has installed an upgraded glass filler from KHS to ensure high-performance beer bottling.

KHS's Innofill Glass DRS filler has been adapted with a number of new features, and Badische Staatsbrauerei Rothaus AG is its first customer. The flexible inline machine has 132 filling stations for up to 50,000 bottles per hour, and allows Rothaus to fill 0.5 and 0.33 L bottles. KHS said it provides hygienic filling with low CO₂ and product consumption.

Fast format part changeovers ensure a high level of flexibility during production planning and line efficiency. According to KHS, the hygienic QUICKLOCK fast-acting locking system cuts conversion time for fillers with a crowner by up to 33% to just 15 or 20 minutes.

Bottle breakages are prevented with the patent-pending SOFTSTOP system. This compact, hygienic bottle flowgate is activated at full power. A light barrier measures the distances of the containers as they are fed into the filler, and a brake wedge then gently decelerates the bottle flow. The filling process and foaming can take place at a high output, ensuring stable filling quality.

As the foaming is dependent on various parameters in the filling process, the OPTICAM system enables the head of foam to be constantly monitored and regulated irrespective of the machine operator. This means that Rothaus can not only prevent undue beer loss due to excessive foaming, it also detects and rejects bottles with insufficient foaming.

KHS Pacific Pty Ltd
www.khs.com

Stretch wrapping solution

The SIAT ProWrap is a PLC programmable stretch wrapping solution with fully automatic wrapping cycle and Industry 4.0 capabilities. It is capable of providing fast pallet processing and can optimise and track accurate film consumption.

Suitable for demanding stretch film applications, the scalable turntable, semiautomatic wrapping machine also provides stability of wrapped loads. It can also optimise film consumption and has the ability to ensure full control of all wrapping parameters throughout the cycle.

With the inclusion of Industry 4.0 technology, the system can provide the ability to remotely supervise machine productivity (up to 30 plts/h), working time and film consumption. The 12 programs and five operating modes are designed to help optimise the packaging process while increasing the stability of the wrapped load. Other features include a variable pre-stretch up to 400% (with double motor) and an option of having different amounts of film in different areas of the pallet.

The control panel uses the latest generation technology to enable customisation of machine parameters and 'load zones' with different levels of holding forces.

Designed to be durable and resistant to heavy-duty environments (-20°C), the system provides high-level performance with limited maintenance requirements.

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Hygienic folding pallet boxes

Dolav Plastic Products has developed the Dolav DFLC, a large pallet box that can be disassembled into five components — four sides and a base — and folded flat when empty. Each component can be washed separately, offering high levels of hygiene.

To test the boxes, Holchem, Dolav and IWM carried out a series of trials. For the preliminary trials, the boxes were coated with a proprietary gel that fluoresces under UV light, and then washed in a customised IWM P100 pallet washer. After washing, the boxes were examined with a UV light source in a darkened room. No fluorescence was seen, confirming that all of the gel had been removed.

Subsequent trials were designed to more closely replicate real-world conditions and the boxes were heavily soiled with a sausage, minced meat and mayonnaise mix prior to washing. The results were assessed using sensitive ATP (adenosine triphosphate) detection techniques and revealed that all surfaces achieved a "cautionary clean" or better standard.

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Smart packaging solutions

HMPSCoconnect features real-time communication in an easy-to-read format, delivering meaningful data to improve productivity. This next-generation of internet of things (IoT) enabled smart packaging solution enables on-the-go information — anytime, anywhere.

The dashboard display shows key operating parameters and performance criteria and it is easy to access current and historical data to achieve machine optimisation. The solution offers real-time monitoring for real-time control and improvements when required.

The enterprise-level system seamlessly integrates with devices such as smartphones and laptops for reduced downtime and on-the-go information.

The system can be retrofitted to older machines and is customisable to suit unique operating environments.

Other features include: ease of use; remote production management; improved OEE — less downtime, more productivity, planned maintenance and streamlined production; fault finding and diagnostics; and remote assistance.

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Aseptic packaging solution for long-life food

Jet Technologies has released an aseptic packaging solution designed to maximise the storage and shelf life of thermally sterilised food products.

The aseptic packaging is a bacteria-free multi-barrier storage option that allows the non-refrigerated storage and distribution of a broad range of food products, while retaining long-term

product quality in ambient temperatures.

The packaging is suitable for beverages, sauces, soups or other food products with a liquid basis such as fruit puree, dairy, wine, jams and more.

According to the manufacturer, the packaging provides an option for seasonal products such as fruit to be stored longer and drip fed out onto

the production line at regular intervals to meet ongoing demand.

The aseptic bags are fully certified and filling sizes are customisable. Available with different spout types to suit the needs of the food manufacturer, the 1" spouts are recommended for juices, concentrate, paste and pulp, while 2" and 3" spouts are recommended for diced food products.

Jet Technologies

www.jet-technologies.com.au



Traysealer for fruit

The G 700 traysealer has a high degree of flexibility when running different tray formats, as well as achieving a high level of output at maximum efficiency. Depending on the product to be packed, the unit can produce tray packs with or without modified atmosphere.

The traysealer is available with a perforator for producing FreshSAFE packs for blueberries. This enables the standard upper web to be perforated during the packaging procedure, so that an equilibrium modified atmosphere (EMAP) is produced within the pack. This means that the packaged fruit remains fresh for longer without the addition of preservatives. The traysealer is suitable for PLA trays, which are produced from renewable raw materials.

MULTIVAC Australia Pty Ltd

www.multivac.com.au



Connected packaging platform

Tetra Pak has launched its connected packaging platform, which is set to transform milk and juice cartons into interactive information channels, full-scale data carriers and digital tools.?

Driven by the trends behind Industry 4.0, and with code generation, digital printing and data management at its core, the connected packaging platform will bring benefits to food producers, retailers and shoppers.?

For producers, the packaging platform will provide end-to-end traceability to improve the production of the product, quality control and supply chain transparency. It will have the ability to track and trace the history or location of any product, making it possible to monitor for market performance and any potential issues.?

For retailers, it will offer greater supply chain visibility and real-time insights, enabling distributors to track stock movements, be alerted when issues occur and monitor for delivery performance.?

For shoppers, it will mean the ability to access vast amounts of information such as where the product was made, the farm that the ingredients came from and where the package can be recycled.

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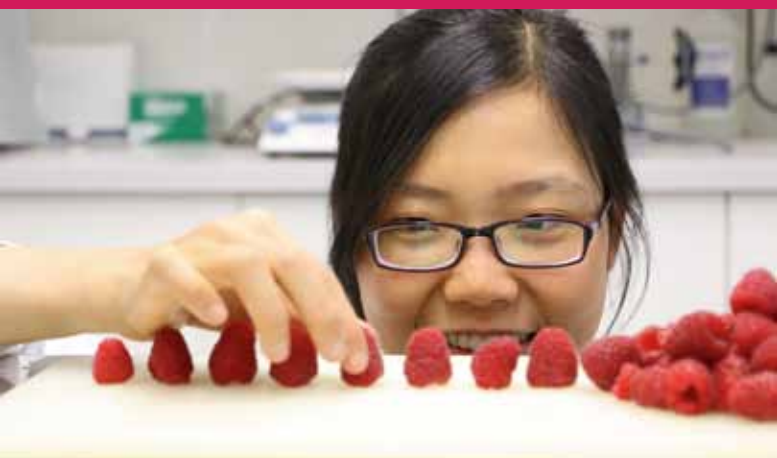
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Improving the shelf life of raspberries



Raspberries are one of the world's most fragile fruits and have a relatively short shelf life compared to larger fruit. Food scientists at the Tasmanian Institute of Agriculture (TIA) have been investigating different packaging and processing methods that could help to improve the delicate fruit's shelf life.

TIA PhD candidate Ky Nha (Nha) Huynh is helping to solve two interlinked problems for the Tasmanian berry industry: packaging and shelf life. The research is part of Huynh's project with the ARC Training Centre for Innovative Horticultural Products, located at TIA.

The hollow structure of berries means they need to be handled with care, including when being washed.

"Moisture gets into the berry, which can lead to reduced freshness after several days."

Keeping berries fresh for longer is a 'catch 22': the berries lose moisture from refrigeration but need to be refrigerated to stay fresh.

Huynh is testing the quality of the berries after being stored for two weeks in different packaging and with different atmospheric conditions.

It's no surprise that the packaging Huynh is testing is called 'modified atmospheric packaging', or MAP.

"MAP packaging, on its own, is not designed for any one specific fruit or vegetable. But because it's sealed packaging, we can alter and test the levels of natural gases in the atmosphere," Huynh said.

"I'm trying to determine the most beneficial atmospheric composition in the packaging."

Packaging alone is not able to control mould and decay — it needs to be tailored to suit the produce — so Huynh is also researching processing methods which may help.

"Exact techniques, like using the right amount of water, are critical to the shelf life of the berries," she said.

Huynh is conducting her research with Costa Berries, which supplied the raspberries for her trials.

Costa Senior Food Safety and Quality Assurance Specialist Ben Fisher has been working with Huynh on the project.

"There's a lot of research and thought behind our products, and it's fantastic to be collaborating with up-and-coming food scientists such as Nha," Fisher said.

"The berry industry is only as good as the product, and freshness and shelf life are obviously essential to avoid food waste.



Weigh, Wrap and Label



WM Nano Auto Wrapper

Bench-top sized with Weigh, Wrap and Label application. The Japanese designed Ishida WM-Nano combines the features of a high end automatic wrapper in a compact unit. Easy to operate, LCD colour touchscreen and wraps up to to 15 packs per minute.

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Invisible data opens a virtual world

German company Fresh Nuts has used invisible code on its retail-ready pallet displays to communicate with customers.

The company produces and sells mixed nuts and dried fruits worldwide with its products primarily available for more than 40 years at ethnic markets. Using its Meray brand, Fresh Nuts launched four different muesli flavour profiles, a product previously unseen on the ethnic market. The campaign was supported by tastings at the point of sale as well as intelligent displays. The pallet displays, developed by Thimm, feature a topper, base, cross bracing, divider bars and four trays. Each of the elements was produced using digital web press technology.

The intelligence portion of the display comes through the digital watermarks printed on the topper and base, which are invisible to the human eye. The codes can be read using the free LinkReader application for internet-connected iOS and Android smartphones. The first of the 1/4 Chep pallet displays hit European retailers in October. Potential customers who scan the topper or base are presented directly with informational or advertising videos for the new muesli. This can have a decisive influence on purchasing decisions at the point of sale. Mobile devices are increasingly becoming digital communications instruments, combining reality with the virtual world.

Daniel Kaufmann, Account Manager at Thimm, praises the intelligent display: "When combined with LinkReader, our digital printing represents an optimal symbiosis. The printing process can integrate app-based codes easily and without degrading the printed image."



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Flexible pouch packaging technology

The Volpak Standcap is a lightweight, inverted convenience pouch solution that can provide mess-free dispensing and instant shelf appeal. The range caters to the current convenience trend and growing demand for flexible packaging, which gives consumers the ability to squeeze the pouch one-handed, reclose and carry.

The easy-to-use flexible packaging solution can be used for a variety of products, including dairy creamy products, sauces and condiments, and spreads and toppings.

Suitable for large- or small-scale production, the versatile pouches can provide a replacement for traditionally used glass jars and metal cans. Savings can be achieved with manufacturing, material handling and transportation, and product waste can be reduced as the inverted pouch design allows consumers to easily squeeze every last drop from the pouch.

Various filling and packing technologies are employed in the production process of the pouches, which are designed to ensure full protection and long-lasting freshness of the packaged product, while also extending the safety timeframe.

Volpak horizontal form filling seal machines for pouching come in a range of models to suit businesses of various sizes.

Heat and Control Pty Ltd
www.heatandcontrol.com



Packaged pasteuriser/steriliser

HRS Heat Exchangers has created its Thermblock packaged pasteuriser/steriliser for food products for aseptic filling, as well as any other filling or packing method. Depending on specification and the intended use, it uses the most appropriate tubular heat exchanger to deliver efficient thermal treatment.

All systems allow for full adjustment of the heating-holding-cooling cycle of the product, so that it can be tailored to the user's products and methods of working. They can also be used as HTST (high temperature, short time) units, subjecting the product to high temperatures for a short time to minimise potential side effects, such as organoleptic changes or nutritional losses.

There are three models: the DTA series features a double tube pasteuriser and steriliser for food products containing pieces or particulates, such as fruit and vegetable dices; the AS series is a packaged annular-space pasteuriser and steriliser solution for thermal treatment for pasteurising and sterilising food products with high viscosity; and the M series is for food with low or medium viscosity.

HRS Heat Exchangers Australia New Zealand
www.hrs-heatexchangers.com/au

Laser marker

The Hitachi LM-C300 is available with two different power output levels — 10 and 30 W — and three different wavelengths — 9.3, 10.2 and 10.6 μm . It is designed to handle marking applications across multiple types of packaging materials including paper, corrugated cardboard, glass, rigid plastics, flexible foils and films.

The LM-C300 CO₂ laser marker in the 10.6 μm version makes good prints on paper and cardboard packaging and glass packaging. This light wavelength suits most packaging applications.

The 9.3 μm version is suitable for the marking of PET plastics. The surface is smoothly marked without the danger of pinholes or risk of cracking the internal structure.

The 10.2 μm version is suited to marking on thin films and any types of packaging foils. Packaging materials that suit this laser light wavelength include PE, HDPE, LDPE, PP, OPP, OPA.MA, POM, PUR, ABS and PVC.

The laser marker adopts new design features for simple and intuitive operation. A new icon-based 10" full colour touchscreen features WYSIWYG message creating and operating environment. The touchscreen is easy to use in both handheld and on the equipment configurations.

Reliability is enhanced due to a new cooling system design where air is supplied through the whole laser tube at the heart of the laser marker. The housing of the laser is environment protected to the rating of IP54 for use in harsh environments.

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From Aussie farms to fork:

Rosella launches 'paddock-to-plate' traceable foodservice range



A traceable foodservice range made with 100% Aussie grown tomatoes is being produced by Rosella to meet the growing demand for local food. The iconic Australian brand has partnered with one of Australia's largest tomato grower and processor, Kagome Australia, to expand into the nation's \$79 billion foodservice industry.

"Having provided consumers with quality, locally grown produce for over a century at Rosella, it's hugely exciting to now bring that same opportunity to commercial kitchens – and their customers," said Rosella's owner, Sabrands, Chief Executive Officer Anthony Davie.

Kagome has grown non-genetically modified tomatoes in Victoria's food bowl — Echuca and the Murray Valley region — since 2010. It will become the supplier and manufacturer of Rosella's new foodservice range, which includes 1 kg or more packs of tomato paste, tomato puree, pizza sauces, tomato sauce and Napoli sauce.

According to Troy Hudgson from Kagome Australia, the company uses RFID technology to track tomatoes from the initial harvesting in the paddock onto the truck, through the unloading and into the processing plant. IoT devices on the harvesters are connected to the RFID scanners on the collection bins so the exact GPS location is recorded in real time.


"During harvesting, the Kagome farm operates 24/7 and produces around 4000 tonnes of tomatoes a day," Hudgson said. The smart sensor technology is used to ensure each bin of tomatoes is traceable to the exact region where it was grown and made. Hudson said it also helps to ensure the freshness of the product as harvesting logistics can be managed on a first-in, first-out basis.

Using Kagome's 'paddock-to-plate' branding technology, each tomato used for the Rosella foodservice range will be traceable directly to the Australian farm where it was grown.

"Research shows nine out of 10 Aussies are more likely to buy locally made products. It's good for our farmers and local communities, so it's a smart move for restaurants and food brands to use Australian ingredients — commercially and ethically. It's what consumers want and expect more of — no matter whether they eat at home or in a restaurant," Davie continued. "It's a great partnership that will continue to build a bright future for one of Australia's oldest and favourite brands."

Both companies will remain separate, but Kagome Australia CEO Jason Fritsch said the company was proud to partner with a brand with a rich history in Australia.

"We aim to make sure the food industry and consumers consciously choose to buy and eat at places who support local produce," Fritsch said. "Kagome and Rosella proudly invest in our people, technology, farming and manufacturing practices to make sure we minimise our waste, support sustainable farming and irrigation practices, and get the foodservice industry and consumers thinking and caring about where their food comes from — right down to the farm it's grown in."

The new wholesale range will be available nationally through foodservice distributors in addition to Rosella's consumer range, which includes sauces, soups and condiments sold in retail supermarkets and grocery channels. 





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Quality in the box

Catherine Norwood

When polystyrene proved a barrier to better marketing their premium reef fish, Queensland's Tom and Kath Long took a leap of faith to develop an alternative packaging system — a re-usable, customisable packaging that initial tests show has a better thermal performance than polystyrene.

Queensland fishers Tom and Kath Long have developed a new packaging system to ensure their premium reef fish arrive at their destination in peak condition. And their innovation could well transform seafood supply chain packaging around the world.

The Longs are small-scale operators based at Kurrimine Beach on Queensland's north coast, midway between Townsville and Cairns. Tom line-fishes for some of the highly sought after tropical species the region has to offer — Red Emperor, Goldband Snapper and Rosy Snapper, to name a few. Kath works in the processing room and is responsible for marketing and promotion.

Their business, TomKat Line Fish, is based on two underlying principles: a premium product and environmentally responsible practices. Tackling the challenge of polystyrene, a hard to recycle and often single-use plastic, addresses both of these issues.

A long problem

The specific driver in developing new packaging is their signature fish, the Red Emperor.

The minimum catch size for a Red Emperor in the Queensland Coral Reef Fin Fishery is 55 cm. The maximum size of a polystyrene box is 53 cm. For Tom this meant his prized catch had to be bent to fit the box when he sent the fish, whole, to chefs at Sydney's top restaurants. It wasn't a good look.

"Because we fish along the continental shelf, a lot of our other fish such as the Goldband and Rosy Snapper are also larger than

those from the inshore fishery. So it's been an ongoing problem for us," Tom said.

This quandary has led the Longs to develop the TomKat KoolPak. The initial prototype combined existing materials in a new way to provide re-usable, customisable packaging that initial tests show has a better thermal performance than polystyrene.

Kath said they've continued to refine the prototype using high-grade plastics. "We wanted to ensure 100% recyclability by our manufacturers, embracing the 'cradle to cradle' principles of sustainability."

The Longs were among the participants in a Fish-X workshop in Brisbane in 2018, part of an innovation program that X-Lab Ventures runs for the Fisheries Research and Development Corporation (FRDC). The Longs' original intention was to improve their marketing, having invested heavily in realising their seafood ambitions during the past seven years.

"We produce high-quality product using dry-filleting techniques. Fillets are portioned, vacuum sealed and blast frozen, locking in that premium freshness," Tom said. "We also supply premium chilled product to clients who appreciate it, such as Josh Niland, who operates The Fish Butchery and Saint Peter restaurant in Sydney."

New skills and a need to innovate

Tom said the Fish-X workshop introduced them to a host of business practices they weren't familiar with, including

'pitching' and critically analysing their operations for continuous improvement. It supported their marketing, which is based on provenance and premium quality.

But the underlying polystyrene box issue remained a barrier to better business processes. The Longs have used data loggers in their deliveries, which are undertaken by a freight company and involve a two-hour drive north to Cairns and airfreight to Sydney.

"When you put a data logger in, you realise how long your delivery is actually out of the cold chain — when it's unloaded, weighed, sits on the tarmac at Cairns, is on the plane and again on the tarmac at Sydney. Even within the cold chain, there are temperature rises. It really hits home how important a thermally insulated container is," Tom said.

International investigations

Following the Fish-X workshop the Longs joined the Fish-X business mentoring program, and also received an FRDC bursary to attend the Global Seafood Expo in Brussels in 2018.

With more than 1000 exhibitors at the expo Tom searched the trade hall for fish processing technologies. Kath

went looking specifically for alternatives to polystyrene. "I went from stall to stall, looking for the magic box for our fish to go in. But there wasn't one," Kath said.

She did find a couple of things, including a flat-packable plastic box that, while good, wasn't quite good enough for the out-of-cold-chain challenges they needed to address. But she did like the way the box could be folded and unfolded, stored flat and re-used. "So we looked for a way to make it better," she said.

Home-grown design

Their own design is now 'patent pending' and involves triple layer protection for the seafood inside. After developing a prototype they conducted a trial run, complete with data loggers, sending fish to an FRDC sponsored stand at the Sydney LollaProducer event in June last year, an annual event that brings together primary producers and chefs.

"The fish looked great when they arrived and the data loggers

gave proof of concept and that is where the journey really kicked off," Tom said.

Prototype trials

Their prototype was used in December to airfreight chilled and frozen product to the Queensland Department of Agriculture and Fisheries food technology centre in Brisbane, part of an FRDC-funded chilled versus frozen product research project.

DAF's lead researcher Sue Poole and the chefs involved in the tasting trial were all impressed with the quality of the fillets that came from the transport consignment.

The Longs are now on the verge of commercialising the TomKat KoolPak, with final testing based on a 1000-box commercial trial scheduled to begin in April.

The rock lobster industry is also interested. Live lobsters are currently packed into polystyrene for transport, and although chilled to the point of sedation, polystyrene is noisy and can stress the cargo. Acoustically as well as thermally, the TomKat KoolPak may also prove a better choice for live exports.

Gathering support

Tom and Kath were among the 12 businesses sharing \$5.4 million in funding in the latest round of Liberal National Government's Accelerating Commercialisation grants. Part of the government's Entrepreneurs' Programme, each of the grants will be matched by industry funding from the businesses and Tom and Kath will use this to help commercialise and market their sustainable packaging solution for transporting seafood.


Accelerating Commercialisation grant applications can be lodged at any time for access to expert advice and matched funding grants of up to \$1 million. These grants cover eligible commercialisation costs and help take products to market.

Fish-X

Making a successful application and becoming a successful start-up is not easy but help is at hand. Fish-X is a remote mentor program, designed to help innovators in the Australian Fishing Industry build a Blue Economy of the future. Fish-X

provides a pathway for those who want to take innovative ideas that solve big industry challenges and turn them into reality by giving participants the tools and supportive environment they need to succeed.

Worldwide manufacturers have struggled to come up with an alternative to polystyrene that can match its thermal properties, leaving many in the seafood sector wary of new products. The Longs hope they have finally cracked the formula, both for their own seafood and for others.

For more information on the TomKat KoolPak, contact Tom and Kath at tomkatlinefish@bigpond.com. 





Eliminating live cattle transport prior to processing

Provenir is introducing an on-farm processing solution for the Australian livestock industry that provides high levels of animal welfare by eliminating the need for live animal transport prior to processing.

Developed to create innovative ag-tech to improve animal welfare and advance sustainable farming practices, Australian-owned Provenir (formerly known as FarmGateMSU Pty Ltd) is building a vertically integrated, commercially licensed mobile abattoir to process livestock at the point of production — on the farm where they were raised.

Currently, every cut of Australian beef is processed in a static abattoir. The consolidation of abattoirs in recent times has required livestock to be transported over longer distances to the processors. The effect of live transport can reduce yield, increase animal stress and consequently have a negative effect on meat quality.

In commenting on his own experience as a farmer, Chris Balazs, CEO and co-founder of Provenir, said: “As a farmer myself, I hate loading my livestock onto the back of a truck. I work so hard to get them in top condition only to risk losing it all to a bad trip. I always knew there had to be a better way.

“Mobile processing makes so much sense, for farmers, for livestock and for consumers. It’s the way of the future for red meat in Australia.”

As well as the high welfare of the livestock, Provenir is focused on providing full traceability and true provenance. By processing on-farm and using the latest in digital traceability technology, they are able to provide full transparency and guaranteed provenance that is validated by the customer themselves.


To ensure full traceability, Provenir is vertically integrated, with full control of the entire value chain, from on-farm processing in the commercially licensed mobile abattoir, through to artisan butchering, and sales and distribution of the packaged Provenir-branded meat product.

In commenting on Provenir’s customers, Chris Balazs, said: “We understand that for today’s consumer, knowing the provenance of their food, how it was produced and whether it meets their personal values is imperative to their purchasing decision.

“Provenir’s unique on-farm processing is the answer to the rapidly growing market of conscientious consumers. The company’s technology will eliminate live transport prior to processing and the associated stress on the animal, which will result in meat of exceptional quality, taste and tenderness.”

To gain inspiration, insight and advice on how to go forward with this innovative ag-tech idea, Provenir looked to the successful Swedish on-farm processing company, Hälsingestintan. Founded in 1999, Hälsingestintan was developed to address the limited range of red meat available in Sweden.

Hälsingestintan founders Britt-Marie and Anna Stegs are strong advocates of Provenir and share Provenir’s vision and concern for animal welfare, traceability and provenance through technology for consumers, and on-farm processing to ensure superior meat quality.

At the 2017 SproutX accelerator ag-tech program, Provenir won both the Judges’ and People’s Choice Awards at a *Shark Tank* style pitch event in front of a crowd of over 250 investors, the press and agricultural industry representatives. 



Plastic detection in meat

The DynaCQ fully automatic plastic detection system is used to detect foreign objects in both minced meat and trimmings, enabling food manufacturers to avoid recall costs and product waste.

Operators in the food industry wear aprons, gloves and protective sleeves made from low-density materials like plastic. Plastic in-liners and covers are also widely used to protect products. Unfortunately, the materials occasionally get torn and small fragments can end up in the minced meat or trimmings.

Low-density materials cannot be detected by X-ray or metal detectors and it is almost impossible for operators to identify small fragments in the product surface with products moving fast on the conveyor belt.

DynaCQ uses a multispectral camera with special illumination to detect unwanted components and allows the processor to stop and remove small fragments which deviate from the natural colours of the product.

The fully automatic flexible detection platform can be configured and integrated into a number of conveyor-based applications for various meat products.

The technology detects plastic items as small as 1.5 x 1.5 mm at fast line speed and points them out for manual or automatic removal. The user interface is simple and intuitive.

Another benefit is the option to store all images with a tag to ensure full documentation of the product as a basic CCP of production.

DynaCQ can be used in several ways as either a simple stand-alone detection unit, integrated into the MES or as a sorting control unit rejecting contaminated products.

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Injection system for brining bacon and poultry

GEA's MultiJector 2 mm brine injection system is specifically dedicated to precise bacon and poultry processing, for 700 mm-wide lines. The system features 2 mm OptiFlex needles promoting a tight injection pattern and allowing for good injection accuracy, product quality and consistency.

The equipment is integrated with the company's SuperChill brine chiller and the MultiShaker that removes excess brine, closes needle marks and activates proteins, resulting in low standard deviation during production and increasing quality, yield and profit.

The 2 mm OptiFlex injector needles combine strength and flexibility: the company claims they are 68% stronger than traditional stainless steel and will flex and recover their shape, helping to prevent bent or broken needles while ensuring consistent quality and maximum productivity. This mitigates over- or under-cured areas in the meat, delivering more consistent taste and colour. The needles are housed within cassettes which provide a consistent needle pattern; they can be exchanged in blocks, which simplifies cleaning and allows for quick changeovers.

The stripper plate on the injection system is adjustable so that the pressure on the meat can be varied — from a light touch to more robust pressure — maximising brine distribution in certain products.

It includes a conveyor belt cleaning system consisting of a hoisting device mounted on a trolley. This design allows the belt to be removed, cleaned and returned by one person without having to remove up any downstream equipment. This simple belt removal means the machine can be easily accessed for quick and thorough cleaning while minimising downtime.

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Tray sealers

The Proseal GT6e and GT1e tray sealers deliver fast packing speeds within relatively small footprints, enabling the machines to integrate more easily into existing lines. The GT6e is capable of sealing up to 160 atmospheric seal packs per minute (PPM) and 96 vacuum gas packs on an 8-impression tool, and the Twin Lane version offers speeds up to 240 atmospheric and 192 vacuum gas PPM. Speeds for the GT1e are up to 110 atmospheric PPM and 60 vacuum gas PPM on a 5-impression tool.

The tray sealers feature a robust stainless steel construction design that can withstand frequent and rigorous cleaning, with full chemical specification machines available for applications requiring a chemical washdown. Another key focus of the design is the avoidance of spaces where food could become trapped or bacteria develop, while electrical components are well insulated for maximum protection during washdown.

The Proseal GT range has the flexibility to perform a wide range of heat seals, including MAP, Vacuum MAP, Skin, Skin Plus and Skin Deep, enabling meat and poultry processors to meet changing packaging trends.

The equipment has skin packaging compatibility with sustainable tray designs, including Halopack, a gas-tight cardboard MAP packaging. Halopack is produced with renewable or recycled cardboard, which is claimed to provide a higher barrier than standard PP-PE or PET packs.

Proseal's E-seal technology can be used to produce a seal force of 200% while achieving a 92% reduction in energy usage. The system can also improve MAP processes through accurate gas flush positioning and reducing gas flush cycle times, making it efficient and enhancing shelf-life extension.

Proseal's ProTect security system can be used to provide control of equipment in order to protect machine settings. In addition, the system can perform audit functions and monitor changes, creating a digital archive of data that can also be exported to external computers for a comprehensive audit trail.

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Pig research brings home the bacon

As part of the 2019 'Pig Production – Science into Practice' course at the University of Adelaide's Roseworthy campus, attendees learnt how early research generated commercial products to provide income to the Pork CRC.

Supported by Pork CRC and Australian Pork Limited, the annual course recently gathered 45 undergraduates and industry participants, including pork producers from across Australia and New Zealand, to learn about pig production, from conception through to processing and the management required in between.

Charles Rikard-Bell, Manager, Commercialisation and Research Impact with Pork CRC, delivered two case studies explaining how early Pork CRC research into near-infrared spectrometry calibrations and sow enrichment blocks had been commercialised with partners Aunir and Ridley Agriproducts to provide an income stream.

He said that AusScan's unique NIR calibrations provided invaluable information for nutritionists and producers. "The calibrations enable nutritionists to accurately predict the digestible energy of cereal grains to more precisely formulate pig diets and producers now have a measure to help them assess parcels of grain for their digestible energy levels before purchase."

Reactive lysine calibrations provided nutritionists with an assessment of available lysine which can be destroyed in the by-product due to processing procedures. Developed by Pork CRC, these calibrations are now being used by feed mills, nutritionists and producers around the world.

"AusScan global NIR scan numbers are increasing every year as the value of the calibration is realised," Rikard-Bell noted.

The sow enrichment block was developed out of Pork CRC Program One research into how nutritional strategies could reduce aggression in group-housed sows. It offers an outlet for the sow to naturally forage and suits a range of housing systems, including fully and partially slatted systems — unlike other forms of enrichment such as straw, which blocks drains. Rikard-Bell explained it minimised harmful behaviour and increased contentment of newly mixed, unfamiliar sows.

"The Ridley Sow Enrichment Block is now successfully marketed in Australia, with USA, Canada and Europe currently being investigated for distribution opportunities, while an international patent is pending," he said.

Developed out of Pork CRC Program Two, Piglet Buddy is an appetite and feed intake enhancer that helps reduce feed costs, early Pork CRC supported research found. Rikard-Bell said: "Simple weaner diets containing Piglet Buddy performed similarly for growth and feed efficiency to more complex and expensive commercial diets."

Piglet Buddy is achieving excellent sales in the Korean market, and BEC, which is marketing the product, plans to register it for distribution in Vietnam later this year.

Dr Will van Wettere, the senior lecturer who coordinated and taught the course, said Rikard-Bell's insights were part of the new content for this year. The course also covered topics such as reproductive physiology, breeding herd management, effluent management, nutrition, health, behaviour and welfare, and included visits to a piggery, abattoir and AI centre, as well as practical demonstrations on AI, heat detection, sample collection and disease diagnosis.



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