

July/August 2019  
Vol.27 No.2

# what's new in **Food** technology & manufacturing



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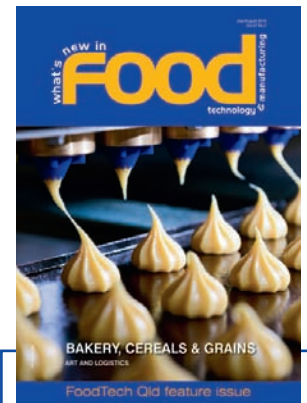
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**FoodTech**  
Qld



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# Creating new lines in manufacturing at **FoodTech Qld**

## **FoodTech Qld**

**28–30 July 2019**

**Brisbane Convention & Exhibition Centre**

**[foodtechqld.com.au](http://foodtechqld.com.au)**

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**T**he triennial FoodTech Qld 2019 expo will run from 28–30 July 2019 (Sunday to Tuesday) at the Brisbane Convention & Exhibition Centre. The theme of this year's expo is 'Creating new lines in manufacturing' and business intelligence themes will include: Advanced Manufacturing; Operational Excellence; Future Food Industry Innovation; Food Safety & Fraud; and Sustainability.

The event showcases innovation from ideation through to production and packaging, featuring: the future of what consumers are demanding, new packaging formats for food and drink, sustainability, seminars, a futurist, business health checks, intelligence and networking with industry leaders.

By bringing together the food and drink processing and manufacturing industry of the north, FoodTech Qld will showcase the latest in food ingredients, food and drink processing and packaging technology, plant equipment along with innovative offerings from food science and testing for the development of new products.

**Please visit**

**the What's New in Food Technology & Manufacturing team at FoodTech Qld on Stand A16 for your free registration.**




Meet innovators from Naturo Technologies — delivering fresh milk with a 60-day shelf life, without preservatives and pasteurisation; Queensland Alliance for Agriculture and Food Innovation (QAAFI) — pursuit of 'digital agriculture'; University of Queensland's School of Agriculture and Food Sciences — application of 3D printing to food; CSIRO's Coopers Plains facility — working closely with small-to-medium manufacturers looking to scale-up products, funding and assisting them seize opportunities that emerge from global trends.

FoodTech Qld will push the boundaries and feed innovation with leading-edge seminar presentations to futureproof businesses and experience new lines of thinking. Industry partners will gather together to show their support and share their wisdom and include: AIFST, AIP, Brisbane Marketing, DIAA, FAN, Federal Government, FIAL, FIAQ, FLA and Qld Government.

- Sunday 28 July 2019 — opens with a strong SME focus at the seminars, with information on New Product Development, launching a Food & Beverage Business doing test runs at the Coopers Plains Research Centre.
- Monday 29 July 2019 — hosts the FIAQ Food Safety Conference along with on-floor presentations on Advanced Manufacturing & Operational Excellence including Government Address, Industry Outlook, Food Factories of the Future and the Industry Leaders Panel discussion on the road ahead.
- Tuesday 30 July 2019 — wraps up with a focus on global food & drink trends, innovation opportunities for brands and sustainability & waste insights.

Workshops across the event include:

- Federal Government — Business Health Check
- AIFST — Food Recall
- AIFST — Navigating the Food Regulation Maze
- AIP — Sustainable Packaging Training Course

Attendees will view the latest equipment and technologies, hear key industry case studies, learn the necessary business intelligence to build competitive advantage, all the while networking with Australia's industry leaders. 

**FoodTech Qld product feature** starts on page 92.





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## The science behind smooth chocolate

Researchers have found that a 140-year-old mixing technique, called conching, is responsible for giving chocolate its smooth texture. The findings could help produce confectionery with lower fat content and make chocolate manufacturing more energy efficient.

A team led by the University of Edinburgh studied mixtures resembling liquid chocolate created using the conching process, which was developed by Swiss confectioner Rodolphe Lindt in 1879. Conching involves mixing ingredients for several hours, but the researchers wanted to better understand the science behind it.

They found conching may alter the physical properties of the microscopic sugar crystals and other granular ingredients of chocolate. According to the researchers, the process produces smooth molten chocolate by breaking down lumps of ingredients into finer grains and reducing friction between particles.

Chocolate previously had a gritty texture because the ingredients form rough, irregular clumps that do not flow smoothly when mixed with cocoa butter using other methods, the team said.

“We hope our work can help reduce the amount of energy used in the conching process and lead to greener manufacturing of the world’s most popular confectionery product. By studying chocolate making, we have been able to gain new insights into the fundamental physics of how complex mixtures flow,” said Professor Wilson Poon of the University of Edinburgh’s School of Physics and Astronomy, who led the study.

The study was published in *Proceedings of the National Academy of Sciences*.

## NSW lamb definition to benefit farmers

The new definition of lamb in NSW, which will come into effect from 1 July 2019, aims to bring it in line with New Zealand and provide growers with greater certainty when going to market. It is also expected to boost lamb producers’ annual returns by \$10 million.

Currently, the definition of lamb is “A female, castrate or entire male that has 0 permanent incisor teeth”. This means the lamb is defined as hogget or mutton as soon as a permanent incisor erupts. As well as involving “a great deal of guesswork”, NSW Minister for Agriculture Adam Marshall said “this means producers can have as little as one month’s warning before they face the price cliff associated with their lamb becoming classified as a hogget”.

The new definition will be ‘an ovine animal that: (a) is under 12 months of age; or (b) does not have any permanent incisor teeth in wear’. Under the new definition, a lamb is able to cut its permanent incisor teeth as long as they are not in wear.

Sheep Producers Australia (SPA) President Chris Mirams said: “The new definition will not allow hoggets or yearlings to be classified as lamb and the extra time once lambs break their permanent incisors is, on average, only 27 days. This is important for producers to know to enable any adjustments to their on-farm management to occur.”

Marshall said the changes will add \$50 on average to each animal and \$10 million per year to the NSW lamb industry.

“This will give producers a clearer timeframe about when they can market their ovine as lamb, ensuring they get the best return on their product,” Marshall said.

“It will also remove the ridiculous situation where, over a weekend, an animal could lose two-thirds of its value just because it lost a tooth, without any material change to its quality.

“This will place NSW producers on equal footing with key international competitors such as those in New Zealand, where lamb is already defined in the same way.”

There is no difference in eating quality for consumers, SPA said.

SPA has released resources to provide guidance to the industry on what the change means in practice and how to apply the new definition.





## No more use-by dates on milk?

Consumers may not have to rely on expiration dates or their sense of smell to determine whether milk has gone bad thanks to a new sensor from Washington State University researchers. The sensor can 'smell' if milk has gone bad before the product is opened, but has no direct contact with it.

"If it's going bad, most food produces a volatile compound that doesn't smell good," said Shyam Sablani, Professor at WSU's Department of Biological Systems Engineering. "That comes from bacterial growth in the food, most of the time. But you can't smell that until you open the container."

It consists of chemically coated nanoparticles that react to the gas produced by milk and the bacterial growth that indicates spoilage, explained Sablani. The sensor detects these volatile gases and changes colour.

While it is still in its early stages, this development could replace expiration dates, which are based on best-case scenarios and only accurate if a product has been consistently stored at the correct temperature.

Currently, the sensor only shows if milk is spoiled or not, but the researchers aim to develop a way to visually show how long a product has before it spoils. Sablani hopes to integrate the sensor into a milk bottle's plastic cap to help predict remaining shelf life.

"We'll have to work with the industry to make this work. But we're confident that we can succeed and help improve food safety and shelf life for consumers," he said.

The research was published in the journal *Food Control*.



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## Tech keeps milk fresh for 60 days

Australian food technology company Naturo claims it has developed a way to produce 100% natural milk that is nutritionally superior and stays fresh for significantly longer than pasteurised and UHT milk.

Described as the biggest breakthrough in the global milk industry since pasteurisation in 1864, the milk processing technology ensures the milk contains no additives or preservatives, and retains its natural colour and taste.

The milk processing technology has already received \$250,000 from the Queensland Government and has been approved by Australian regulatory food safety authority Dairy Food Safety Victoria (DFS) as 'an alternate treatment to pasteurisation for raw milk'.

While pasteurisation heats milk to a minimum of 72°C for at least 15 seconds to make it safe for human consumption, Naturo founder and CEO Jeff Hastings said this process also destroys

some of the healthy nutrients. He explained it "kills all alkaline phosphatase activity, an essential enzyme for liver function and bone development, and reduces the vitamin B2 and B12 levels. These are particularly essential vitamins for children."

Naturo's processing technique does not rely on heat to kill pathogens, and could be applied to other forms of milk including camel, goat and sheep's milk.

"The primary difference between our milk and pasteurised milk is the fact that we don't 'cook' the milk to make it safe for human consumption. Our milk is much closer to milk in its original state and is independently proven to be nutritionally superior," Hastings said. "Our patented process is the only known method that kills *Bacillus cereus*, a common but unwanted spore forming bacterium in milk that produces toxins causing vomiting or diarrhoea. Our process makes our milk really safe."

While the specific process has not been revealed, Hastings has previously used air pressure to prevent cut avocado from turning brown.

The milk also has a minimum 60-day refrigerated shelf life, with the company stating independent scientific testing revealed it remained fresh and safe for consumption after 91 days, compared to the 14 days for standard fresh pasteurised milk. According to Naturo, the long-lasting product has the potential to open up new export opportunities, as it can be shipped to markets such as Japan, China, Malaysia, Singapore and Indonesia.

"Our milk can be shipped to all parts of the world that have limited or no access to fresh milk. There is also massive potential for the development of a wide range of dairy products and use-by industries where unpasteurised milk is desired, such as cheesemaking."

Naturo is seeking investment for a pilot plant in Australia capable of producing 10 million litres of milk per annum, which will allow it to establish commercial-scale operations for its own brand of products for the domestic and Asian markets.



Image supplied by Naturo.

# Food

FOR

## thought

### Why do some red wines taste 'dry'?

The dryness sensation, also known as astringency, has long been linked to the tannins and refers to a puckering or rough feeling in the mouth upon drinking wine.

However, the researchers reporting in American Chemical Society's *Journal of Agricultural and Food Chemistry* have found that tannin structure, concentration and interactions with saliva and other wine components influence the perception of dryness.

The researchers extracted the tannins from a dry (Cabernet Sauvignon) and less-dry (Pinot Noir) red wine.

Through various analyses, they found that the Cabernet Sauvignon contained more, larger and more highly pigmented tannins than the Pinot Noir, and these tannins formed more protein aggregates in saliva.

Trained sensory panellists perceived Cabernet as dryer, with a longer-lasting dryness, than the Pinot.

Interestingly, when the opposite type of tannin was put into Cabernet or Pinot wines, the panellists could not detect differences in dryness.

So, for example, when Cabernet tannins were added to a Pinot wine, the drink appeared to have the same dryness as the original Pinot.

However, when Cabernet tannins were added to a model wine (ethanol and tartaric acid in water), panellists rated the dryness intensity and duration higher than that of the original model wine.

Therefore, the distinctive aromas of the two red wines likely influenced the panellists' perception of dryness, preventing them from noticing the added tannins.

These results could help winemakers manage dryness perception based on wine composition and tannin characteristics, according to the researchers.



### Egg industry cracks down on *Salmonella* Enteritidis

Following the recent series of *Salmonella* Enteritidis (SE) incidents across the country, Australian Eggs said the egg industry is committed to limiting the spread and maintaining consumers' confidence in eggs.

SE has been detected on 11 egg farms in New South Wales and one in Victoria, with the first detection in NSW in September 2018. The Egg Basket has conducted one of the most recent egg recalls due to potential SE contamination.

All impacted farms have been quarantined and undergone decontamination. Australian Eggs' Managing Director, Rowan McMonnies, said the efforts of

government authorities and industry has been critical in stabilising the situation.

"An intensive tracing and testing process has been conducted by government authorities since late-2018," McMonnies said. "This process has ensured that when SE has emerged it has been caught early and the public and broader industry were protected. All the contaminated sites have been detected through this process and they continue to be limited to a cluster of interconnected farms."

They are interconnected in the form of people, eggs or equipment moving between them, Australian Eggs explained.

"*Salmonella* Enteritidis is a new and unique bacteria for us in Australia and responding to the threat has been a learning experience for both government and industry. Risks are driven by biosecurity practices and farm management and it is these issues that are the focus of our response."

With many egg farms wanting greater certainty about the origin of the eggs they purchase, the company said the industry is also engaging with governments to discuss how to improve traceability systems.

McMonnies said the discovery of SE in Australia has hit egg farmers hard and many of the contaminated farms have been unable to recover. "Having withstood a year of drought that doubled the cost of feed grain, egg farmers now face the cost of even higher biosecurity measures," he said.

While the egg industry is working to minimise the impact, consumers are encouraged to cook eggs properly, wash hands and wipe surfaces to limit possible cross-contamination.





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# Food FOR thought

## Halt the salt in processed food

75% of the salt in the Australian diet comes from processed and packaged foods, and consumers are eating almost double the daily recommended intake.

Australian manufacturers are making some progress with salt reduction but overall we are lagging behind countries such as the UK, according to VicHealth Acting CEO Dr Lyn Roberts.

If Australia is to achieve its commitment to the World Health Organisation's target of a 30% reduction in the average population salt intake by 2025, then we need to act now.

Launched on 3 May 2019 by the Heart Foundation and VicHealth as part of the Victorian salt reduction partnership, the Halt the Salt salt reformulation guide for food manufacturers is claimed to be an Australian first.

The best practice guide to salt reduction for Australia food manufacturers supports reduction of salt in processed and packaged products. It guides manufacturers through the reformulation process with information on checking nutritional composition, completing competitor benchmarking, establishing salt targets and time frames, product improvement and testing.

Leading nutritionist, reformulation expert and guide author Vanessa Clarkson said this guide is particularly useful for small-to-medium food manufacturers.

"Food manufacturers looking to reduce salt in their products will find this guide a useful starting point for their reformulation journey. By working collectively and over time to reduce salt in the food supply, consumers' palates will adapt to lower amounts and together we can have a big impact on public health."

Heart Foundation CEO Victoria Kellie-Ann Jolly welcomed the guide as timely with the federal government's work to develop voluntary salt reformulation targets nearing finalisation.

"Our Reformulation Readiness guide provides a handy roadmap for Australia's food manufacturers to embark on their salt reformulation journey," Jolly said.

Dr Roberts said salt reformulation strategies are a "best buy" for improving Australia's health.

"This guide is about supporting food manufacturers to work towards voluntary salt targets, backed by strong government leadership."

For more information, visit:

[unpackthesalt.com.au/salt-reformulation-in-australia/](http://unpackthesalt.com.au/salt-reformulation-in-australia/)



# Taste is all in the mind



**W**hether people prefer bitter or sweet beverages, such as coffee or cola, depends more on how they make them feel than their taste, research suggests.

Northwestern University Scientist Marilyn Cornelis searched for variations in taste genes that could explain people's beverage preferences. Instead, she found that preferences are based on genes related to the psychoactive properties of these beverages.

"People like the way coffee and alcohol make them feel. That's why they drink it. It's not the taste," explained Cornelis, Assistant Professor of Preventive Medicine at Northwestern University Feinberg School of Medicine.

In the study, beverages were categorised into two groups: one bitter-tasting group which included coffee, tea, grapefruit juice, beer, red wine and liquor; and a sweet-tasting group which included sugar-sweetened beverages, artificially sweetened beverages and non-grapefruit juices.

Scientists collected 24-hour dietary questionnaires from 336,000 individuals in the UK Biobank and counted the number of servings of these bitter and sweet beverages consumed.

The study — which is claimed to be the first genome-wide test for bitter or sweet beverage preferences — highlights important behaviour-reward components to beverage choice and adds to our understanding of the link between genetics and beverage consumption.

Alcohol intake is related to more than 200 diseases and accounts for about 6% of deaths globally. Understanding taste preferences could indicate ways to intervene in people's diets, but Cornelis said these results highlight the potential barriers associated with this approach.

She found people with a variant in the FTO gene preferred sugar-sweetened beverages, which was surprising considering it was previously related to a lower risk of obesity.

"It's counterintuitive," Cornelis said. "FTO has been something of a mystery gene, and we don't know exactly how it's linked to obesity. It likely plays a role in behaviour, which would be linked to weight management."

The paper is published in *Human Molecular Genetics*.





what's new in

**Food**  
technology & manufacturing

# Prepared food and bakery, grains & cereals





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# Temperature testing technology helps to reduce food waste

Dr Abdel Ezbiri, Cerulean

**Under food hygiene regulations, the safety of a wide variety of foods is dependent on the maintenance of correct temperature conditions in compliance with the principles of Hazard Analysis and Critical Control Point (HACCP). Generally, temperature is the main factor affecting the prevention of microbial food spoilage.**

In addition to temperature and storage time, the speed and extent of spoilage is affected by the type of food product, its composition, methods used during processing, contamination during processing and the nature of packaging. Temperature testing therefore performs a vital role in the protection of consumers and in compliance with food hygiene regulations relating to sandwiches, snacks, ready meals, prepared foods, and both chilled and frozen foods.

Traditional methods involve the insertion of a metal probe into the food product in order to determine the temperature of the food; usually at the probe's tip. In order to check the temperature of a food product, the probe is inserted so that the tip is in the centre of the food (or the thickest part) and left in place until the reading stabilises. After the reading is taken, the probe must be thoroughly cleaned and disinfected to avoid cross-contamination between samples.

Crucially, if the food sample is affected by the testing process (for example, if the packaging seal has been broken) it is no longer suitable for consumption and must be discarded.

## Non-destructive testing (NDT) technology

There are two main types of non-destructive testing methods — remote infrared cameras and microwave thermometry. Infrared cameras are able to accurately measure the surface temperature of objects remotely. Their advantages are that they are non-destructive and fast, but their main disadvantage is that they measure the surface temperature, which is not necessarily the true temperature of the food, especially if the sample is within packaging.

Instruments that employ microwave thermometry have the major advantage of testing the whole product, producing an average temperature for the entire sample, quickly and accurately. The Cerulean Celsius range of instruments employs this technique for food testing and new versions of this technology are also being developed to improve efficiency.

## Waste from invasive temperature testing

The amount of waste resulting from invasive temperature testing depends on a number of factors. Firstly, the volume of food products being tested will vary according to the type of food and the individual process. Operators will need to be able to dem-

onstrate that the frequency of testing is appropriate and that the samples being tested are representative of a batch. Consequently, the proportion of food going to waste following temperature testing varies considerably between different processing plants.

Cerulean

<https://www.cerulean.com/en/>

## Case study: Labeyrie Fine Foods

Labeyrie Fine Foods produces a range of products for some of the largest supermarkets in the UK. The company began NDT food testing with a Celsius instrument in early 2017 and now tests a wide range of products, including raw, hot smoked and smoked salmon in a range of forms from fillets to sliced and flaked products. Technical & Quality Systems Auditor Stephen Bradbury said: "This technology enables us to ensure that all chilled products are between zero and four degrees centigrade, quickly analysing the temperature of any given product to ensure that the correct controls are in place."

Staff at the company's site at Duns in the Scottish Borders regularly conduct around 50 tests each day. During peak times this can increase to 70 tests per day. Before 2017, the temperature probe method was employed at the site, which meant that an extra packet had to be created for each destructive test. There were also occasions when additional checks were required, which led to further packs being tested and then wasted. Following delivery of the NDT machine, the tests for both methods were run in tandem for a month to check the performance of the Celsius, but thereafter all tests have been undertaken by the faster non-destructive method.

The instrument was purchased for both commercial and environmental reasons. Bradbury said: "It helps us guarantee that the entire product within the outer case is at the correct temperature before it is sent to the customer, and as a non-destructive method it enables us to test as many product cases as required."

"From an environmental perspective, the machine helps us to achieve fish and packaging waste reduction every day."







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# Perfecting the art of seasoning nuts

David Woollard, group product manager, seasoning solutions, tna

**Nuts are thriving in the healthy snack food category. Their success shows no signs of stopping; health, convenience and taste are key drivers in purchasing behaviour. But nuts are nothing new, and today's consumers are demanding more.**

From sweet honey to spicy paprika or smoky barbecue, adding extra seasoning to nuts can deliver the diverse taste experiences consumers seek. There are several trends that are poised to further diversify the market and gain new followers. Consumers can expect tropical sensory profiles with Latin American influences, such as olive, key lime, mango, paprika, dark rum and sour orange. Asian flavours will also hold court in the retail aisles, with new snack product development predicted to include exciting tastes like cardamom, tikka masala and matcha.

To meet the growing demand for a wide variety of flavours, manufacturers require seasoning equipment that can complete multiple seasoning tasks over a short period of time. This includes being able to switch between flavours quickly and easily, adjust outputs according to demand and regulate oil and seasoning levels accurately. Building flexibility into the manufacturing process is therefore a critical consideration.

There are two types of seasoning equipment available to snack manufacturers: main line seasoning (MLS) and on-machine seasoning (OMS) systems. Which technology is more suited often comes down to product mix, cost, flexibility and efficiency. MLS is a great solution for long, single product runs, while OMS offers a higher level of flexibility. OMS systems can be set up in multiple line configurations where each seasoning system applies

a different flavour into individual bagging stations, but they are also ideal for shorter production runs that require regular changes on a single line. This makes them particularly useful for multipack productions or to fulfil direct sales needs — helping to deliver greater production efficiencies.

Perfecting the art of seasoning can transform nut products and help manufacturers gain a competitive edge. Developing a successful product relies on the primary dimensions of seasoning: appearance, smell, taste and time. The finished creation needs to look appealing, smell enticing, taste exciting and, most importantly, the flavour needs to stay in the mouth for the right amount of time — for a complete sensory experience. Oil, wet flavours, dry seasoning and slurries all play their part in setting the seasoning dimensions.

## Dry seasoning

Dry seasoning is the traditional method of applying flavour to snack products, including nuts. Dry powder seasoning comes in many different forms — each of which brings its own processing challenges. Whether salt, cheese powder, crushed natural ingredients or sophisticated encapsulated flavours, all dry seasoning behaves differently when exposed to air, mechanically handled, metred and applied to a product. Achieving even distribution of the seasoning, without clumping, is therefore a key consideration for manufacturers.



### System innovation

Innovative technology such as the tna intelli-flav OMS 5 can help snack manufacturers meet the evolving needs of consumers in the nut sector, as it is suitable for all types of seasoning.

An all-in-one solution, it can provide accuracy and consistency for both dry and wet seasoning in a single drum. It also allows highly accurate seasoning weighing for dry ingredients, and has a unique spray lance design that produces precise spray patterns in wet seasoning. It can help save manufacturers time by spraying oil and then applying seasoning powder in the same drum. Manufacturers can also use the tna intelli-flav CLS 5 to create a homogenous mix of slurry seasoning throughout the spraying process, due to the smaller reservoir. In addition, the system's nozzles feature tna's unique atomising air control technology for an even slurry flow that is designed to reduce blockages.

Seasoning systems that incorporate loss-in-weight powder feeder technology not only ensure application accuracy, but also positively affect profitability. Seasoning is one of the more expensive ingredients in the snack line, so every little bit counts. Reducing the amount of giveaway through over-seasoning by only 1% is able to lower the cost per bag by up to 10%.

To add variety to their product portfolio at minimum cost, manufacturers should also look for seasoning equipment that delivers a high degree of flexibility. Independent scarf feeders and separate lightweight tumble drums enable manufacturers to run alternative product varieties alongside traditional lines, for example, for low salt options.

### Wet seasoning

The adhesion of seasoning onto the surface of a nut is closely tied to the stickiness of the product itself. Although their natural oils help with both adhesion and flavour, a lot of nuts still require an extra coating before any dry seasoning is applied. This can be done by introducing an oil or fat prior to the application of dry seasoning. Manufacturers can also add liquid flavours to their products for an extra flavour boost. Lemon or chilli oils, for example, create top notes that allow the flavours to develop on the palate over time. With new flavour combinations emerging, the liquid flavour range is likely to expand further over the next few years.

Wet flavours have often proven challenging to apply precisely and consistently. While they can be introduced into bulk mixing systems for ease of application, it can add time to cleaning and changeover processes. New technology that injects flavour into the oil flow prior to spraying is creating an opportunity for manufacturers to apply diverse flavours in liquid form.

Being able to accurately control the amount of oil, fat or seasoning is also important to avoid waste and adhere to labelling requirements. A top performing spray system will be able to control spray temperature, as well as accuracy of application. Mass flow control is generally the best way to achieve this. In addition, equipment that can handle higher concentrations of seasoning powder require less fat and oil to be sprayed onto the products for the seasoning to stick, opening up further opportunities for low-fat products and minimal fat declarations.

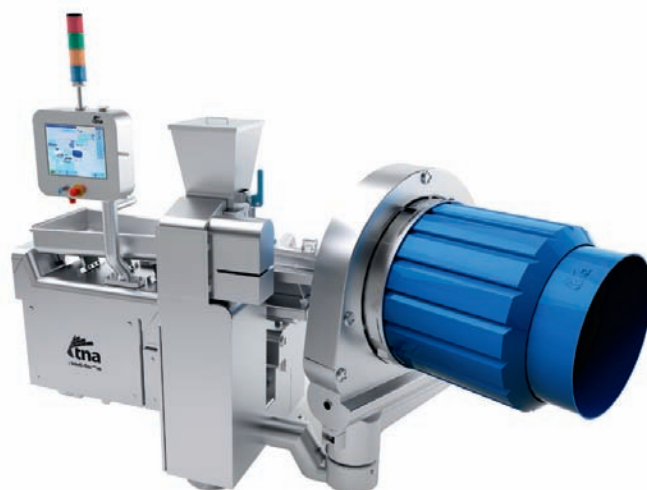
### Slurry seasoning

Slurry seasoning is a great way to add an extra dimension of texture and taste to nut products by incorporating a suspension of powder in a liquid. This can be a powder in oil, starch in water or similar mix combinations.

Starch slurries are used as 'glues' to create stickiness for better seasoning adhesion. Sugar or Arabic gum solutions, for example, are often used as alternatives to oil-based slurries, enabling the development of 'healthier' nut products with 'no added fat' positioning. Together, slurry seasoning and dry roasting work well for manufacturers looking to keep nuts free from added fats and oils. The slurry, comprising water, Arabic gum or maltodextrin, is added to the nuts before the roaster. Then a dry seasoning is applied before the nuts are roasted. This process removes any liquid — an important step for prolonging shelf life — and ensures the seasoning adheres to the nuts.

A key factor when applying a slurry seasoning is ensuring a consistent suspension of the powder within the liquid. The unique composition of slurry seasoning means it is essential that the wet and dry flavours are blended homogeneously. This is especially important with salt application as the granules can drop to the bottom of mixing tanks, resulting in inconsistently flavoured products. Manufacturers should therefore look for smaller mixing vessels as these are able to maintain a homogenous mix and are ideal for frequent flavour changes. Easy-to-clean solutions that incorporate automated cleaning technology are also essential to reduce downtime between different production runs.

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## The downside of microwaveable soup and noodles

Microwaveable instant soup products are responsible for 20% of children going to emergency departments with scalds.

"Scald burns are a major cause of preventable injury among children, and our research found that instant soup spills are responsible for a large number of these painful burns," said Courtney Allen DO, FAAP, a Pediatric Emergency Medicine Fellow at Emory University.

'Instant Soup Scald Injuries in Children' was presented at the American Academy of Pediatrics (AAP) 2018 National Conference & Exhibition.

The researchers examined National Electronic Injury Surveillance System data from 2006 to 2016 to identify paediatric patients whose scald burns were caused by either microwavable instant soup, instant noodles, cup of soup or water for making instant soup. They determined scald burns related to instant soups and noodles affect more than 9500 US children annually between ages 4 and 12 years.

The peak age for instant soup spill injuries was 7 years and 40% of the children had burns to their torsos. Interestingly, 57% of the children were girls — does this make the girls more clumsy or, more likely, more inclined to be involved in food preparation.

### What can the food industry do?

Is the packaging designed to minimise scald risks? Would structural changes make the items more stable and less likely to tip?

### Is the lidding robust enough?

While adult supervision is essential, it is imperative that the food industry delivers the safest packaging possible.

## Citrus waste can create high-fibre bread — study

Italian researchers have found a way to create high-fibre wholemeal durum wheat bread using citrus fibres from blood orange and lemon peels. These findings could help increase consumers' dietary fibre intake and reduce citrus processing waste, and could lead to bread with a long shelf life.

In Italy, the citrus industry produces about 500,000 tonnes of 'pastazzo', a by-product from squeezing citrus fruit, every year. According to the study, this can be washed and purified to obtain citrus flour rich in dietary fibre, which can be added to food products.

Researchers from the University of Catania and Council for Agricultural Research and Economics (CREA) studied how the addition of citrus fibres affected durum wheat whole bread. They evaluated the quality of the bread during a storage time of up to 120 days under MAP conditions, testing properties including volume, weight, crumb porosity, loaf firmness, crust thickness, colour, pH, acidity and sensory analysis.

Published in *Frontiers of Nutrition*, the study found "the addition up to 2% of blood orange and lemon fibres in wheat whole durum flour is a possible strategy to produce 'high fibre' bread".

Compared to a control bread with no added citrus fibre, it was found to have a similar quality but with a citrus flavour. There were no major differences in terms of volume, weight, internal structure, pH or acidity, but storage time did affect firmness.

The researchers noted there was no visible mould growth in well-sealed packages, but from 30 days onwards there was an increase in yeast and mould counts in all samples.

"In the control bread, the yeast, mould and TVC remained slightly lower during all storage times possibly due to the absence of fibre, although the differences are not significant up to 60 days of storage," the authors wrote.

Although there were some minor sensory differences during the 120 days of storage, the bread samples "did not develop off-odour and off-flavour" throughout this time.

The study concluded that "the addition of citrus industry by-product fibres in durum wheat whole semolina is a possible strategy and a good prospect to produce 'high fibre' wholemeal durum wheat bread to increase the nutritional value and the dietary fibre intake".



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# metos

## TempPro can run hot and cold with the new Proveno.

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## Where is my cream cake?

Paul Eastwood\*, CEO, Pollen Consulting Group

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As a British person in Australia, we arrive with a chip on our shoulder about how far ahead the UK fresh food proposition is in the supermarket. Our Waitrose ready meals or our Tesco sandwiches for only two British pounds. Not to mention the famous M&S desserts, and chilled and fresh cream delights that only the likes of Zumbo once created on these shores.

**T**hen after about five years in the industry and a multitude of projects later, you finally admit it. The UK has it easy and is only ahead because the industry has what we call the 'tiny' advantage, meaning the UK is quite literally tiny in comparison.

The United Kingdom (242,900 km<sup>2</sup>) is only 30% as big as New South Wales (Australia) (800,640 km<sup>2</sup>), with a population density of 65 m compared to 7.9 m in NSW.

### So, what advantage does this give the UK?

#### Sandpit

Testing new products is pretty easy with smaller risk; range reviews are frequent and a multitude of retailers are looking for the best NPD (new product development). It also doesn't cost much for a quick turnaround; a single factory can produce an SKU (stock keeping unit) and it can be on the shelf the next day.

#### Logistical advantage

Geography is one big advantage, logistic costs are a fraction in the UK from factory to consumers, yet with fresh products perhaps time is the biggest winner as products can be in store within 12 hours. Consideration should be noted that this is as much due to the slow speed of Australian supply chains as perhaps a geographical advantage.

#### Scale

Due to the slow speed of logistics and fragmented development of the Australian industry, each state has a multitude of suppliers selling into the category and even producing the same product in different states. Therefore, to invest in automation costs three to four times the amount, as the business has multiple factories rather than one flagship factory as it would in the UK.


As a result, the Australian market relies heavily on people, which drives an hourly premium. In particular, the need to

produce on a weekend to meet fresh needs against a double-time premium. Perhaps it's time to realise all 168 hours in a week are of equal value and should be paid as such, by letting Adam Smith's invisible hand set the price.

#### Capital advantage

Scale is a capital advantage; the ability to invest and grow a single entity with your team in one place, which is quality controlled once and equipment is fully utilised on the first day rather than under-utilised across multiple states.

I believe these are a list of excuses and with investors, retailers and manufacturers we can be brave and take a big leap together.

There are locations in Australia where it's possible for 75% of the population to be reached in under 12 hours. What we need is a campus for collaboration; a hub with a number of businesses and their single central factories and supply chains in place that have both speed and scale. With this in place they can take state operations, invest the right capital to roll up under one roof and bring NPD at a faster pace at one production point. As mad as it sounds, this collaboration could champion the food campus of the future and make fresh truly possible. 

*\*Paul Eastwood established Pollen Consulting Group in 2016 with a vision for a different management consultancy that focuses on values, rather than process; with this in mind he formed a bright, energetic, hardworking and honest team. Paul's down-to-earth approach is refreshing and fun; he is a straight talker who works collaboratively with businesses to find the best possible solutions to the greatest challenges. He has a wealth of industry knowledge through 15 years' experience of delivering great results for a vast range of global and local FMCG businesses. He has a passion for simplifying supply chains and operations and can usually be found on the factory floor with the team and clients.*

Pollen Consulting Group  
www.pollenconsultinggroup.com





## Cutting equipment for bakery products

Choosing the correct cutting machinery is key for bakery operators looking to increase productivity and minimise costs. The Urschel size reduction, slicing and cutting solutions are designed to assist bakery operators meet their production goals.

**Model CC slicer:** The Urschel Model CC uniformly slices, strip cuts, shreds and granulates a variety of bakery foods at high production capacities including coconut shreds, and nut slicing and granulating. This versatile machine features interchangeable cutting heads that enable the processor to change the type of cut in just minutes.

**Comitrol Processor:** The Comitrol Processor is used as an effective solution for a multitude of dry, paste and liquid size reduction applications. Several different models are available to accommodate different applications within the bakery industry. The Model 1700's range of applications includes peanut butter, coconut for cream or shreds, cereal products, bread crumbs/flakes, corn masa, granulated toppings/coatings, biscuit/cookie rework, various nuts, and fruits for fillings, pastes, sauces, juices and more.

The Model 3600 is suitable for small-volume to high-capacity production and is universally accepted for difficult rework applications. Bakery products high in fat and moisture are cleanly cut into precise, free-flowing granulations at high capacities, allowing the producer to rework pretzels, pastas, pastries, cookies, granola, sandwich crackers/cookies and many other applications.

**DiversaCut Sprint Dicer:** The DiversaCut features a compact cutting zone enabling precision cutting to increase product in the user's targeted parameter with just the push of a button. The DiversaCut Sprint Dicer offers assorted dices and granulations of candy, cookies and fruit bits while taking up minimal floor space. The machine features continuous operation for uninterrupted production and is designed for easy clean-up and maintenance. Decreasing waste and improving cost savings, the sanitary and stainless steel design features a cutting zone completely separate from the mechanical zone.

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# Processing & testing



# Mango auto-harvester

## a good pick in Queensland

Claimed as a world's first, Professor Kerry Walsh revealed details of CQUniversity's mango auto-harvester at the Australian Mango Industry Association conference in May.

CQUniversity has been conducting field trials of the first prototype of its mango sensor and auto-harvest technologies at Yeppoon in Central Queensland. The technologies are currently achieving a 75% efficiency in automatically identifying and picking fruit in view; however, the aim is now to take it to commercial-ready deployment with over 90% efficiency.

The equipment was developed as part of a RND4Profit Commonwealth-funded research project led by an industry R&D corporation, Horticulture Innovation (*Multiscale Monitoring of Tropical Fruit Trees*, led by UNE).

"The auto-harvester has the potential to solve some of the major labour force issues that currently limit the industry," said Professor Walsh.

"The harvester is part of an integrated system which will ensure farmers know exactly how many fruit are on their trees, when they will be in perfect condition for the consumer and when to employ the right number of people for picking and packing.

"The end goal is to save costs and improve productivity on farm, while driving consumer demand by ensuring a top-quality eating experience every time."

Professor Walsh's team has previously delivered to industry a near infrared spectroscopy (NIRS) measurement system to assess the eating quality of mangoes and predict the ideal harvest time.

NIRS sensors and the Fruitmaps app are now adopted within the mango industry. This laid the foundation for CQUni to research in-field machine vision systems to count fruit and estimate fruit size, for fruit load estimates

before harvest, allowing farmers to better plan their harvest (eg, employing the right number of pickers at the right time).

"The next step on from that, having 'seen' the fruit, was to try to reach out to pick the fruit to automate the harvest," Professor Walsh said.


"Both harvest estimates and autoharvest work best deployed in small tree-high density orchards, so this work complements the Queensland DAF work on such orchard designs."

The prototype harvester takes approximately five seconds to harvest a fruit, from detection to placement.

Ian Groves, of Groves Grown Fruit, Yeppoon, hosted the first field trials of the prototype auto-harvester and was excited by the "game-changing" potential of the technology.

"The machinery identifying and counting fruit in the orchard turned out to be within just a few per cent of the actual number of fruit in the entire block last year," Groves said.

"That technology is also able to measure the size range of that fruit and so knowing how much fruit is in that block, knowing when it's going to be mature and knowing the size of the fruit, means we can schedule our workforce, order the right number of cartons, the size of the inserts going into those cartons — this could be a real game changer, not only for our farm but for the entire industry."

The auto-harvester was mounted on a trailer and towed by a ute. The next phase of research will investigate options for it to be mounted on a terrestrial drone to operate autonomously, at faster speeds and higher accuracies. 

CQUniversity  
[www.cqu.edu.au](http://www.cqu.edu.au)



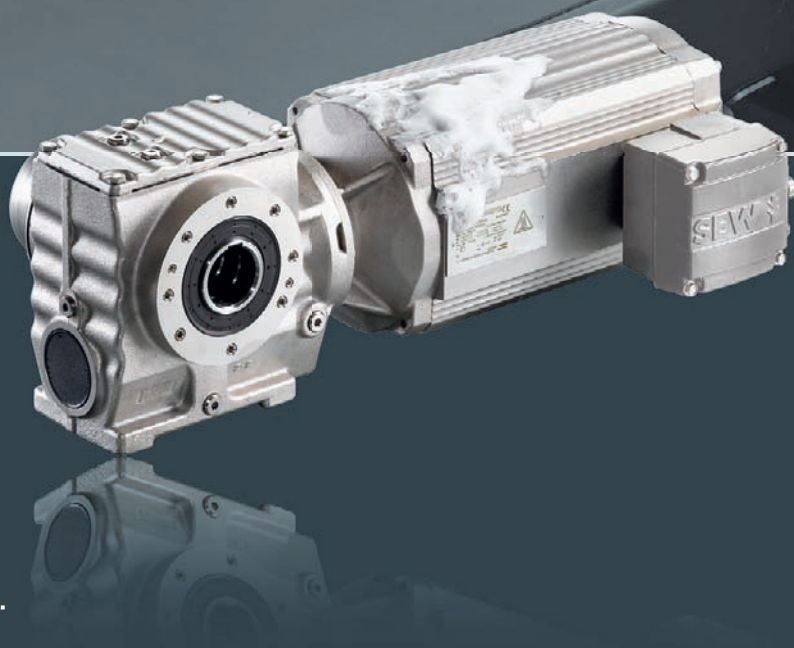


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# From adaptive eggs to food testing, new Aussie tech revealed

An on-the-spot food testing device that can detect lactose in lactose-free products and point-of-lay egg sensor technology that can reduce waste are two of the nine Aussie technologies revealed today by a CSIRO-powered research accelerator. Some of the other innovations relevant to the food industry include a sensor that gives robots a sense of touch and a sensor to track and monitor bee pollination to increase crop yields.

**T**he innovations are the creations of the teams participating in ON Accelerate, an accelerator program dedicated to unearthing amazing research in science and technology and steering it towards commercialisation.

This year's cohort, Accelerate5, has spent the last 12 weeks turning their research-led ideas into real-world solutions. ON's Accelerate5 Demo Day was held on 2 May 2019.

Adaptive Eggs technology is designed to improve sustainability within the egg industry by providing a new way to identify male eggs early, thus avoiding the costly and undesirable culling practices in the egg laying industry. According to team member Caitlin Cooper, 7 billion eggs are wasted globally each year and the Adaptive Eggs technology can help by turning this waste into high-value product. The point-of-lay technology is industry scalable and prototypes are available now.

Bee Innovative is designed to maximise bee pollination to increase crop yields. A radar-like sensor identifies, tracks and reports bee pollination activity across orchards and fields in near-real time. The team of Kate Lyall and David Lyall turns

flowers to food by improving the bee pollination process. According to David, the size of fruit depends on how many times a bee has visited the fruits, so Bee Innovative is designed to also increase the yield of premium-sized products such as the blueberries shown below.

Parts Per Billion is an on-the-spot food testing device about the size of six-pack Esky. It can detect almost any molecule of interest to deliver lab-quality results for food producers and processes. The innovation team for this product includes Stephen Trowell, Jo Davey, Alisha Anderson, Florence Bravo and Karine Caron. According to Trowell, the test can, for example, detect lactose in lactose-free products in minutes compared to weeks spent previously, as the product was required to be sent to off-site laboratories.

Contactile is designed to give robots a human sense of touch. A tactile sensor provides the sensory advantages of the human hand without the physical limitations related to size and strength, while also enabling robotic gripping with just the right amount of force. The team of Heba Khamis and Benjamin Xia is now looking to commercialise the sensor prototype.

David Burt, Executive Manager of ON, commented: "This year's Accelerate cohort once again shows the exceptional science coming out of Australia's research sector. We've spent the last three months working with the teams to take their innovative ideas out of the lab and into the real world. The outcome is nine solutions that have the power to truly transform everything from farming to precision health care."

Other innovations presented on the Demo Day included: Advanced Genetic Test to determine the risk of a heart attack; IRIS to reduce cheating in online assessments; Innovia Medical to treat abscesses without surgery; MGA Thermal to improve thermal energy storage; and N1 Analytics encryption technology to allow businesses to share data externally without the risk of data loss or data misuse.

To find out more about the other innovations, visit [www.oninnovation.com.au](http://www.oninnovation.com.au).



Before Bee Innovative.



After Bee Innovative.



## 2D/3D profile measurement sensors

The Micro Epsilon 2D/3D profile scanner from Bestech Australia, scanCONTROL, utilises the principle of laser triangulation sensors for detection of 2D profiles of different objects. This is achieved using special lenses to enlarge a laser beam to form a static laser line that is projected onto the target surface. The diffusely reflective light is collected on a highly sensitive sensor matrix to generate the 2D profile of the objects. A three-dimensional profile can be generated in case of measuring moving objects or using a traversing sensor.

The scanCONTROL profile scanner utilises advanced technology for measuring profiles with 4 kHz frequency. Therefore, it is suitable for inline measurement of gap, profile, edge, step and angle in the industry. It also features a compact and robust design for applications in processing lines and areas where space is limited. The real-time surface compensation feature of the sensor is designed to offer reliable and stable measurement independent of surface condition.

Available with different laser types, this 2D profile scanner has several possibilities for applications in the food industry. The conventional red laser version is suitable for use in packaging or manufacturing lines to verify the size of the manufactured product or packages. The blue laser version is suitable when used to measure organic materials. It has been previously used as part of a quality control system in chocolate production to identify the profile of the chocolate bar.

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# ragazzini

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# Taking the guesswork from wastewater disposal

David Tenenbaum

For more than a century, cheesemakers and vegetable processors have applied water remaining after production to open fields and farmland. Producers have removed most impurities from this wastewater. But there was no definitive answer on whether the remaining nitrogen (in the form of nitrate) was polluting groundwater.

The report of a three-year study, jointly funded by industry and the Wisconsin Department of Natural Resources, was released late last year. The results offer some support for the long-held belief that much of the nitrogen in the wastewater leaves the soil and harmlessly enters the atmosphere.

Wastewater disposal is a daily need at Del Monte's canning factory in Cambria (a village in Columbia County, Wisconsin, US), which processes green beans, peas and sweet corn for about five months every year. Each day, the Cambria plant pumps about over a million litres of wastewater, mainly from washing, blanching and cleaning, to a nearby hayfield, where a centre-pivot irrigator drips it onto the soil.

Producing 1.5 billion kg of cheese in America's Dairyland creates about 21 billion litres of an effluent that carries a higher concentration of nitrogen than cannery wastewater, and is typically disposed of in furrows. Although some large cheese facilities use in-plant wastewater treatment systems, a solution that is expensive for vegetable processors who operate seasonally and for small and mid-size cheese plants.

In both the vegetable and cheese industries, the study results could affect the cost of disposal, by raising or lowering the need for land and equipment.

As well as providing some support to the belief that much of the nitrogen in the wastewater leaves the soil and harmlessly enters the atmosphere, the groundbreaking study also showed that rates of this process, called denitrification, vary depending on season, soil type, crop cover and application rates, said Geoffrey Siemering, a UW-Madison soil contamination specialist.


Because the atmosphere contains about 78% nitrogen, measuring transfers from the soil is extremely difficult, said study leader Francisco Arriaga, a professor of soil science. The automated technology developed in his lab captures and measures nitrogen as it escapes to the atmosphere. Efforts by PhD candidate Clay Vanderleest were instrumental in developing this technology for the study.

"We expected to be surprised, as this important measurement has never, to our knowledge, been possible in real time," said Siemering, who works with Arriaga. "What we found was reassuring, on the whole, but also suggests that better system management could improve how the water is treated and further reduce the possibility of nitrogen entering groundwater."

The study made repeated measurements of nitrogen release at disposal systems used by three cheesemakers and three vegetable processors in Wisconsin. Data were gathered from probes buried in the soil. Gas was collected from the soil surface during several one-week periods at different times of the year.

The heart of the system was a series of automated sampling chambers connected to a photoacoustic analyser. The analyser, based on an 1880s invention by Alexander Graham Bell, identifies elements by exposing samples to specific wavelengths of light, and then measuring the soundwaves that are generated. This system measured nitrogen gas exiting the soil every few minutes.

The new results should help to refine disposal permits so vegetable processors and cheesemakers can maximise the amount of wastewater disposal while still protecting the environment, Siemering said.

The \$255,000 project was funded by the Midwest Food Processors Association, Wisconsin Cheese Makers Association and the state DNR. 



## Static eliminators

Materials such as paper, plastic or textiles normally contain an equal number of positive and negative charges — that is, they are electrically balanced. Friction can disturb this balance, causing the material to become electrically charged, exerting a force on nearby charged objects or a grounded connector. Problems caused by this force include dust clinging to product; product clinging to itself, rollers, machine beds or frames; materials tearing, jamming or curling; sheet feeding problems; and hazardous sparks or shocks.



EXAIR offers systems for total static control. When static is a problem on moving webs, sheet stock, three-dimensional parts, extrusions or packaging, EXAIR Gen4 Static Eliminators (also called ionisers) can eliminate the charge.

Combining engineered airflow products with ionisers gives the company the ability to eliminate a static charge quickly and from great distances. Laminar flow airstreams make it possible to blow away any contaminants and eliminate the charge that attracts them. They are suitable for hard-to-reach places or obstructed surfaces, product moving at high speeds and surfaces with a high charge.

In some situations, even the smallest amount of airflow can disturb the product. This is especially true for lightweight materials. EXAIR manufactures two styles of ionisers for these critical applications: Gen4 Ionizing Bars and the Gen4 Ionizing Point.

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# Robot-assisted filleting machinery for the fish industry

Frank Würthner, Global Business Management Packaging

The Icelandic company Valka, headquartered in Kópavogur, specialises in the development of automation solutions for the fish industry and has made a name for itself with technological innovations in this market, which is characterised by demanding production requirements.

**T**he system developed by Valka produces extremely precise cuts at different angles through a combination of X-ray radiation, 3D image processing and a robot-controlled water-jet cutting head. Fully automatic deboning, filleting and portioning of fresh fish are accomplished quickly, reliably and efficiently, giving Valka's customers key competitive advantages.

Valka has specialised in the development of automation solutions for the fish industry since the company was founded in 2003. Among other solutions, the company has introduced systems for fish cutting, deboning, weighing, packaging and ice dosage onto the market.

"In the past we worked with different technologies and suppliers, which made the variety of interfaces increasingly difficult to handle. That's why we decided to fundamentally revise our automation infrastructure by choosing the open PC and EtherCAT-based platform from Beckhoff as the universal controller," said Valka's Marketing Manager Ágúst Sigurðarson, describing the initial challenge that arose two years ago.


"Today, we can say we made the right decision," added Einar Björn Jónsson, Product Development Manager at Valka. "Instead of special components from various suppliers we now use standard components from Beckhoff and get everything from a single system: the PC-based control platform integrates all necessary functions, from the PLC and the robot axes through to the safety systems and the HMI. The effort required for the manufacturing, calibration and troubleshooting of our machines has been reduced significantly on account of the centralised control platform."

The control platform of the cutting machines consists of a C6920 control cabinet Industrial PC (IPC) with Intel® i7 quad-core processor and TwinCAT 3 automation software. All four processor cores are utilised in order to exploit the full

performance of the IPC: the operating system and the motion control technology each use one core, while the PLC uses two cores. On the networking side, compact EtherCAT I/O modules are used for the I/O connections. Safety technology is also integrated seamlessly into the control system via EtherCAT safety I/O modules. The motions of the cutting robot are controlled in software via TwinCAT NC I and TwinCAT Kinematic Transformation, while AX5203 EtherCAT Servo Drives and servomotors from the AM8000 series with One Cable Technology are used as the drive technology.

The Valka cutter removes bones and cuts the fish into precise portions fully automatically. "We developed a combination of X-ray radiation, 3D image processing and robot-controlled water-jet cutting heads that makes it possible to identify even very fine bones down to a width of 0.2 mm. The robots can work at different cutting angles and cut the bones out with such high accuracy that we now have losses of only 4 percent compared to 6 percent previously. For our customers that means additional revenues of several million kroner per year, depending on the tonnage of fish processed," Jónsson stressed.

Each fish fillet is analysed precisely and cut into even portions with regard to size, weight and thickness according to the respective specification. In addition, different cutting patterns or programs can be defined in the software and various fillet sizes can be determined flexibly.

"A key special feature of these robotic solutions is that they are operated with a standard software platform — entirely in keeping with the philosophy of Beckhoff that all software tools must function on a simply structured platform," said Jónsson. 

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## Microprocessor transmitter/controller

The Bürkert Type 8619 multiCELL transmitter/controller is suitable for measurement and control as well dosing processes, eg, in water treatment plants, food plants and pharma plants.

Available in two housing variants for panel or wall mounting, the microprocessor transmitter/controller enables the connection of sensors that deliver raw signals for pH, ORP, conductivity and flow via pulses or sensors (like pressure, level, chlorine) which delivers analog signals (0–20 mA, 4–20 mA, 0–2 V, 0–5 V, 0–10 V).

Modularity in hardware and software offers high flexibility for adjusting it to the applications.

The electronics and control algorithms ensure that optimum process control is maintained at all times with minimal operator intervention.

The support of the Modbus TCP, PROFINET (Conformance Class B) or EtherNet/IP means the 8619 can be integrated into most industrial Ethernet environments. Therefore, all important process values like measurement data, process diagnostics or device status can be easily integrated into the automation system.

The simple, intuitive user interface with a large, adjustable, backlit graphics display makes reading and configuring easy.

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## Temperature monitoring system

For almost all food manufacturers, it is important to keep an eye on critical temperatures. If equipment failure is not picked up in time, great economic losses can occur.

The TempReport System with T-TEC Data loggers is designed to provide a flexible and reliable temperature monitoring system. The loggers can be placed anywhere: in fridges, freezers, show cabinets, stores and even delivery trucks.

When the loggers are put to work, they stay in place. Radio signals are sent from the loggers to the gateway connected to the USB port or Wi-Fi and cloud. The log files are stored in the loggers, in the database on the PC and optionally in the cloud.

The powerful software lets users graph, print and analyse the files and export to spreadsheets.

With cloud storage and an app on an Android mobile phone, the user can receive real-time temperature updates and a graph of the last three days.

Alarms come as notifications and are stored in the phone. If there is a power blackout, the loggers will keep collecting the data, but it will be obvious that there has been no update from them. The time of the latest update can be seen on TempReport and the app.

**Temperature Technology**

[www.t-tec.com.au](http://www.t-tec.com.au)





## Automated pin-boning project for NZ King Salmon

**Mt Cook Alpine Salmon has partnered with Scott Technology and Seafood Innovations to develop an automated system for removing pin bones from its highly prized King Salmon.**

Unlike the ubiquitous Atlantic Salmon, King Salmon, or Chinook, has a finer bone structure and there are more than 30 pin bones in every fillet. Although technologies have been developed for automating pin bone removal from Atlantics, these solutions have not proven suitable for pin boning King Salmon.

New Zealand is the largest producer of King Salmon in the world, according to Brent Keelty, who currently manages the processing operations for around 500,000 fish a year at Mt Cook Alpine Salmon. However, when the company originally visited large equipment manufacturers to develop an automated solution for this species, the volumes were too small to interest them.

With no alternative available to replace the tedious and costly manual task of plucking out each bone, one by one, Mt Cook Alpine Salmon needed to develop a solution to meet the growing demand for bone-out fillets and portions of its King Salmon.

"A year ago we partnered with Scott Technology to research various known technologies around the world and to develop a pathway that could provide some level of automated solution to the manual pinboning task," said Keelty. "It was the ideas and knowledge displayed by Scott in this preliminary work that gave us confidence to proceed with the current project."

New Zealand-based Scott Technology has expertise in imaging technologies and robotics in the food sector.



*One of the team at Mt Cook Alpine Salmon's Timaru plant removing pin bones from King Salmon fillets.*

"It was this set of skills we needed to tackle a project like this," said Keelty. "But we wanted a pragmatic approach that would provide a staged solution along the way to a potentially fully automated solution."


According to Scott Technology CEO Chris Hopkins: "We love a challenge like this. It's ingrained in our culture, finding interesting ways to apply technology solutions to business challenges — particularly to help fast-growing New Zealand companies whose products are delivering valuable

export revenues for the country."

In the first instance, an assistive handheld device was developed by Scott Technology for Mt Cook Alpine Salmon.

"We will follow with some more advanced concepts deploying our machine vision technologies to develop a high-resolution 3D view of every fillet and then use algorithms to determine the precise locations of the bones in each fillet. Then the plan is to adapt our robotic automation to remove the bones," said Hopkins.

Because of the pioneering nature of the project, Mt Cook Alpine Salmon approached Seafood Innovations Ltd to provide financial assistance and was delighted to receive more than half a million dollars of backing for the project.

The pin-boning project has several milestones and is expected to take another 14 months to complete. 

*This article was republished with permission from Scott.*

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

# Hygienic sensor solutions: Immune to germs and bacteria

Christian Freudig and Marco Kaiser\*

Stainless-steel sensors from SICK deliver exceptional performance combined with compact dimensions, chemical and thermal material resistance, and lasting impermeability. Furthermore, all of the opto-sensory device types in the photoelectric sensor product families, for example, are also available in stainless-steel versions — energetic photoelectric proximity sensors, photoelectric proximity sensors with background suppression, through-beam photoelectric sensors, and photoelectric retro-reflective sensors.

The stainless-steel sensor portfolio from SICK also offers suitable solutions for safety technology tasks, the identification of products and containers, position monitoring and path measurement, pressure, temperature and level measurement, and the inspection of packaging and its contents. These solutions offer the highest level of process reliability for the manufacturer and maximum product safety for the consumer. At the same time, they ensure reliable functioning and consistently high levels of availability even under the harshest application conditions — because the automation tasks must not impact negatively on the hygienic design.

## Product contamination: Three hazard zones in practical applications

Hygiene-compliant sensors ‘shine’ not only on account of their stainless-steel housing but also as a result of numerous other measures that guarantee the best possible chemical and thermal resistance as well as impermeability. These reasons — and the lower quantities compared to standard sensors — justify a correspondingly higher price level. It is therefore worth taking a look at practical examples such as a cutting and processing machine in the meat industry, a dairy machine for cheese production, and a filling and capping line in a beverage bottling plant. Each case involves typical plants that have to be cleaned and disinfected regularly to prevent hygiene risks resulting from intermediate or end products becoming contaminated with microorganisms,

spores or inorganic residues. In terms of possible contamination risks, the machines and plants can be divided into three hazard zones, with corresponding consequences for the components that are to be used there.

Zone C is the non-food area of a machine where sensors can be protected by covers, for example, or mounted in such a way that they cannot come into contact with food. Standard sensors can, therefore, be used in this zone to enable economically efficient automation solutions.

Zone B is the area of a machine where external surfaces and plant components are cleaned with cleaning agents and disinfectants. In this area, standard sensors cannot withstand the required cleaning and disinfection, for example with a surfactant, acidic, chlorinated and chlorine-alkaline foam cleaners, or neutral disinfecting agents or those containing hypochlorite or peracetic acid, as well as the use of high-pressure cleaners with pressures between 80 bar and 100 bar. Stainless-steel sensors and components in a washdown design are the ideal solutions in this case. They offer the required robustness and are designed (eg, with bevelled surfaces or rounded edges) so that cleaning and disinfection media can run off leaving as little residue as possible.

Sensors used in Zone A — where they are near the product — also undergo extremely demanding cleaning and disinfection processes. Also, however, they must meet special hygiene requirements and comply with recommendations, standards, ordinances and regulations relating to hygiene. These situations call for

stainless-steel sensors with a hygienic design, which offer maximum protection against germs and contamination risks.

## Hygiene as a chain of competency: Safe sensor solutions with no weakest link

The portfolio of stainless-steel sensors and accessories from SICK offers hygienic solutions for flexible automation, protecting machines and processes, for quality control and identification applications. To ensure the continuous and long-term safety of products and processes, it is necessary to meet a variety of requirements concerning the chemical resistance, thermal resistance, impermeability and structural design of the stainless-steel sensors while adhering to market standards. These are interrelated like the links of a chain, where the weakest link will determine the suitability of the sensor or system solution for hygienic applications.

*\*Christian Freudig is Product Manager Business Unit Photoelectric Sensors & Fibers, Global Business Center Presence Detection and Marco Kaiser is Strategic Industry Manager for Consumer Goods – Packaging, Global Industry Center Factory Automation, both at SICK AG, Waldkirch, Germany.*

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Arredo Inox S.r.l. has invented the patented Cuomo Method for the processing and storage of food in a closed, controlled and safe environment. Its range includes: Maturmeat for dry ageing meats; Pesciugator for fish drying; and Stagionello for salami fermentation, drying and seasoning.

Maturmeat is used for controlling and managing the maturation, curing and seasoning of meat in a closed environment. Equipped with a CIP self-cleaning system, the cabinet manages the

The Cuomo Method provides processes which are simple to operate but advanced enough to digitally record the complete 'life cycle' of the protein while it is being aged or fermented, to ensure the safety of the product and the commercial viability through maximised yield.

The Sicur Food Control records all the data for HACCP and health department records. The information can be stored or transferred to a storage device.

The Fumotic system adds and maintains the humidity inside the Maturmeat chamber, which is designed to minimise the yield loss. The system will alarm if there are any issues with the machine or the parameters. There is an option for external monitoring.

Available in several sizes, each cabinet is licensed and the programs are validated to comply to Australian standards. Customised options are also available for larger volume operations.

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# NZ sheep farmers diversify into cherries

Mt Pisa Station (pronounced “Py-sa”) owns 4600 hectares in the Central Otago region of New Zealand — all of which has access to the Clutha River via the Pisa Irrigation Scheme.

At the foot of the iconic Pisa Range, after which the station is named, there is a site that is gently sloping and perfectly suited to growing cherries, with free-draining soils. Currently used to graze sheep, fatten lambs and grow supplementary winter feed, this land is being set aside for a \$15.5 million cherry venture by New Zealand horticultural specialist Hortinvest.

Mt Pisa Station manager Shane MacMillan said the family's sheep and beef business would invest in the project, which would see 80 hectares of prime land produce premium quality cherries for export from 2021–2022.

Mt Pisa Station has been in MacMillan's family since his grandfather started farming merino sheep in 1924. The cherry project will be its first foray into horticulture.

“In farming, diversification is always a good thing, although you are sometimes limited by what you can do, depending on the nature of your land,” MacMillan said.

“This is a decision made by our family with the help of our advisory board over some time, and has been driven by many factors, such as the need for succession planning.

“Cherry orchards are grown all around us and we know cherries from Central Otago deliver high returns on the global market. From an agricultural perspective, producing a cherry crop in three to four years is a short time frame.

“This type of diversification is not a decision we made lightly but we investigated it thoroughly and are excited about the future.

“There are other horticultural opportunities available to agriculturalists in New Zealand but Hortinvest's model is unique and it's hard to beat its depth of experience in cherries.

“There will be a period of adjustment and, from a farm management perspective, I will miss the land as this comes at a time of intense development, which has included land

clearing, pasture renewal and subdivision. The consequence of this has been an increase in stock numbers and production. However, in the long term, various family members who live on the station will benefit from the cherry project,” he said.

Hortinvest is in the final stages of subscribing investors to two \$15.5 million, 80-hectare projects in the Central Otago area. The other is at Lindis Peaks Station.

Hortinvest orchard and project manager Ross Kirk said both projects were nearly fully subscribed, following widespread interest from a range of individual, corporate and foreign investors.

“We're now working with several major corporate funds and a foreign investor. A commitment from these will ensure the projects are fully subscribed and can proceed to the next stage of development. We expect to finalise these by next week's deadline or early in June.”


Lindis Peaks Station farmers Lucy Annan and Simon Maling have also committed to invest in the Lindis River project.

The minimum investment in each project is \$100,000, spread over four years, with the first cash called for on 30 June.

The expression of interest deadline for both projects closes on 31 May.

Kirk said that after 31 May, Hortinvest would form management companies, draw tree maps, lay irrigation and prepare the land for planting 14,000 trees — the first of 106,000.

Led by experienced horticulturalists Ross and Sharon Kirk, Hortinvest's focus is on producing export-quality cherries and maximising returns to investors.

The Hortinvest team has extensive experience exporting cherries to established and growing markets in Taiwan and China, and is developing new markets in India, Indonesia, Europe and the United States. 

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## CIP heating for food and beverage industries

Efficient heating of CIP (clean-in-place) solutions is an integral part of quality control and maintaining product integrity for any food or beverage business.

Teralba Industries designs and manufactures a wide range of CIP heaters using Dimpleflo tubing, which increases heat transfer coefficients. This means the Dimpleflo CIP heater is more compact and has a smaller footprint than conventional heat exchangers.

As the CIP heaters are designed for high steam and water pressures, the Australian-made heat exchangers can handle line pressure steam, up to 12 bar(g). This means reduced installation costs as a pressure reducing station is not required, unlike plate heat exchangers.

**Teralba Industries**  
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## Flow meters and controllers for liquids

Bronkhorst develops micro to low flow liquid metering instruments based on a thermal mass flow measuring principle. A wealth of experience has been gathered which has resulted in three product series that cover full scale flow ranges from 75 mg/h up to 20 kg/h.

With the introduction of the CORI-FLOW series, the company expanded its liquid flow measurement and control capacities to 600 kg/h, using a Coriolis type mass flow sensor with high performance. With ranges down to 0.05 to 5 g/h for the mini CORI-FLOW series, it has become an (ultra) low flow specialist.

The ES-FLOW liquid flow meter for 4 to 1500 mL/min operates on an ultrasonic measuring principle. This liquid flow meter can be combined with a control valve or pump to constitute a compact liquid dosing device.

Additionally, Bronkhorst develops a series of (ultra) low flow Coriolis mass flow meters and controllers. These flow meters and controllers are fluid independent and can be used for both gases as well as liquids.

AMS Instrumentation & Calibration is the official sole distributor for the Bronkhorst range of instrumentation.

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## Washdown guns

Tecpro Australia has a range of washdown guns that are suitable for high- or low-pressure applications.

Some are colour-coded to identify hot or cold water while others come in white, often used for the dairy, food, beverage and pharmaceutical industries.

If users have low water pressure and need to boost their cleaning impact, it has a hose gun that combines compressed air with water to provide a powerful cleaning jet.

There are low-flow hose guns to conserve water consumption or when water supplies are limited. Other hose guns are all-in-one foaming units and some are corrosive resistant.

Every hose gun is designed and manufactured to last and the company stocks replacement parts for many hose guns in its range.

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





## Twin screw pump

Designed for handling fluids which are sensitive, abrasive and either high or low viscosity, the Alfa Laval Twin Screw Pump is suitable for use in hygienic applications in the dairy, food and beverage, and personal care industries. The pump is quiet and virtually pulse-free, as well as being smooth and gentle during operation.

Built on a robust platform that meets stringent hygienic standards, the pump is capable of handling both product transfer and cleaning-in-place (CIP). Its low pulsation characteristics and good solids handling capabilities are said to reduce the risk of product damage, thereby improving product quality. Maintenance is thus simplified and process uptime increased.

Two-in-one operation provides easy handling of process media of varying viscosities as well as CIP fluids. This simplifies piping and pump control, minimising contamination risks. High suction performance with good lift capability and low NPSHR provides installation flexibility and increases product recovery.

Quick, easy seal replacement with the pump in place is made possible, due to a cartridge seal with a front-loading, self-setting design. This maximises process uptime and minimises maintenance. An optional seal service kit program adds maintenance flexibility.

The pump features a clean, external stainless steel finish with profiled elastomers and mechanical seals fully surrounded by the product. Designed for maximum cleanability using FDA-conforming materials, the pump is both EHEDG and 3-A certified. An optional ATEX version enables use in hazardous zones.

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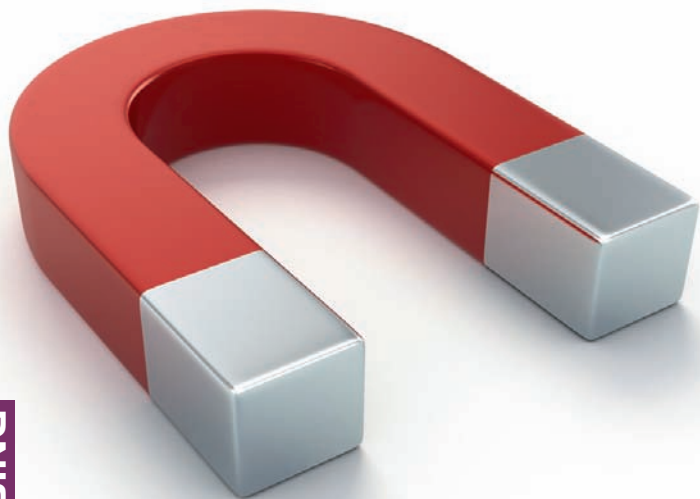
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## Improving product security and profitability with metal fragment control

**T**he introduction of the new FSMA Act and the tightening of industry standards is forcing food manufacturers to be more proactive in reducing their food safety and product security risks.

Along with plastic and glass, metal fragments are one of the most commonly found physical hazards/contaminants in food. These may enter the product stream with incoming raw materials and result from equipment wear and tear (work-hardened stainless steel fragments). Metal contamination in the final product can have serious implications for the companies involved, including product recall, loss of customer trust, legal and financial damage, and product wastage.

Increasing foreign metal fragment control will increase your product security and, in turn, help increase the profitability of your business.

Here are three steps you can employ in your food manufacturing plant to greatly reduce risks.

### 1. Plant risks assessments/magnet validations

Magnet validations (or 'magnet audits') assess the effectiveness of your existing magnetic separators and areas where metal contamination risks are present. Collected data is compiled into a Magnet Validation Report which contains recommendations for increasing control in medium- to high-risk locations.

AMR Consulting are experts in metal fragment control and magnet validations for the food industry.

### 2. Effective magnetic separators and metal detectors

Like metal detectors, magnetic separators are also essential in reducing metal contamination risks and increasing product security.

The information from your current Magnet Validation Report should highlight areas where action is required to reduce risk, and this may require replacing/installing magnetic separators.

Remember, a 10,000-gauss magnet does not mean it is an effective magnet. If maximum metal fragment control is your goal, then it is crucial to also consider factors aside from magnet strength before making a purchase.

### 3. Frequent monitoring of magnets and metal content

Preventing metal contamination is an ongoing task. Installing magnets and forgetting about them until the next magnet audit is a mistake that has the potential to be very costly. Like most equipment, magnets need to be closely and frequently monitored.

Frequent monitoring and cleaning of your magnets will help you gain control over metal. Establish a system in your company that sets out how often magnets should be checked and cleaned, and ensure that records are kept.

### Increasing your product security

Following these three steps and taking a practical, proactive approach to reducing metal fragments in your process lines will greatly assist in controlling metal contamination, increasing product security and increasing profitability.

Magnattack Global has a team of qualified and experienced technicians that are ready and able to help you reduce risks.

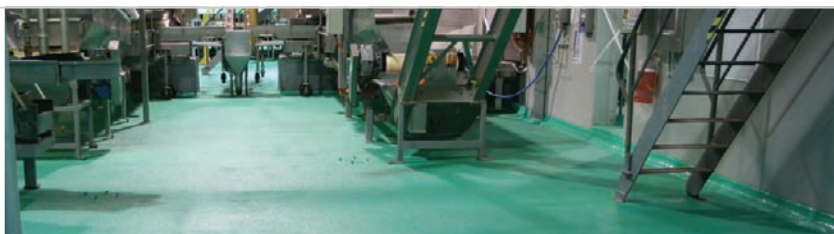
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## CASE STUDY

### Citrus oil producer uses vacuum distillation



Italian company Capua 1880 uses dry screw vacuum technology from Busch Vacuum Pumps and Systems to produce high-quality essential oils from citrus fruits for use in food flavouring and perfumes.

Capua 1880 has two production plants located in Calabria, where over 96% of the world's production of bergamot is grown. Oils are also extracted from lemons, oranges, blood oranges and mandarins.

Between October and May, the citrus fruits are harvested and processed at Capua 1880's Reggio Calabria plant. The essential oils containing water are extracted mechanically from the fruit skins on 12 production lines. First, the remaining solids and then the water are separated from this emulsion in the downstream multistage centrifugal separators. The raw oils extracted in this way are refined throughout the year at the Campo Calabro plant and mixed for individual customers. 5% of the bergamot essences produced in this way is used in the beverage industry for flavouring.

The raw oils extracted in the first stage are refined on a total of five distillation lines and then temporarily stored in a controlled atmosphere. Distillation of the essential raw oils must be carried out as carefully as possible so that the scents are not influenced by other ingredients in terms of fragrance or colour.

Capua 1880 uses vacuum technology from Busch Vacuum Pumps and Systems for the distillation processes, which are carried out in thin-film evaporators or short-path distillers depending on the type of fruit. All the distillers use only COBRA screw vacuum pumps that are free of operating fluids. The frequency-controlled vacuum pumps guarantee the required vacuum level which, together with the temperature, ensures the desired product quality.

The company decided to switch to dry COBRA screw vacuum technology from Busch in the late 1990s. The liquid ring vacuum pumps previously used only achieved a vacuum of 40 to 60 millibar, and a higher temperature was therefore required for evaporation. This was 80–90°C for thin-film evaporators, depending on the type of fruit.

All thin-film evaporators are now equipped with COBRA screw vacuum pumps, which maintain a higher permanent vacuum. This means the distillation processes can be carried out at ambient temperature. Varying ambient temperatures or different oils can mean that fine adjustments of the operating vacuum and the pumping speed of the vacuum pump are required. This is possible by regulating the frequency-controlled motor of the vacuum pump.

Short-path distillers (Figure 1) operate at even lower pressures. This is why vacuum boosters, also driven by frequency-controlled motors, are installed upstream of the COBRA screw vacuum pumps. In short-path distillation, the exact operating pressures also depend on the oils to be distilled. The operating temperatures are usually slightly higher than the ambient temperature but significantly lower than when liquid ring vacuum pumps were used.

COBRA screw vacuum pumps have been specially developed for applications in which low pressures and the compression of extracted gases and vapours without operating fluids are necessary, for example, to prevent contamination between the gas or vapour with an operating fluid.

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Our in depth knowledge of the food processing environment gives us the edge and is our real point of difference. Starting with processing techniques, through raw material/ingredients, machinery selection/installation, project management, product development, implementation and training.

Our core strength is within the meat processing industry - red meat, small goods and poultry, as well as the convenience foods, ready meals, fish and cheese industries.



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## CONTACT

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### Mini pipe clamps

Traditionally, spray bars required prefabrication (such as welding) prior to installation. Once installed, adjusting the spray or adding nozzles was difficult.

Designed and made in Italy, the ZPN Mini Pipe Clamps enable any spray pipe to be assembled onsite without the need for special tools or welding equipment. Simply drill the spray holes where required, attach the clamps and screw in the spray nozzles.

The single-spring mini pipe clamps are quick and easy to connect to pipes from ½ to 1" in diameter. Made from plastic, the clamps are colour coded to indicate size, making it easier to identify which one is required.

**Tecpro Australia**

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

### Metal detector

The Eriez Xtreme Metal Detector is designed to achieve high levels of sensitivity to detect small ferrous and non-ferrous metal contaminants in sanitary and non-sanitary environments.

Suitable for applications in the food, textile, pharmaceutical, plastics, rubber, chemical and many other industries, the system can detect 0.2 mm spheres.

The base package features a 7", easy-to-use touchscreen interface, multiple pre-programmed languages, easy set-up and reporting, multiple USB and interface ports, remote access and the standard high-pressure washdown design.

In addition to its hygienic design and rugged construction, the unit is easy to use for set-up, operation and reporting using a large well-designed graphic interface.

**Eriez Magnetics Pty Ltd**

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# Tasmanian distillery combats counterfeiting using IoT

Old Kempton Distillery (OKD) is located in the small town of Kempton in Tasmania, where it produces some of the finest single malt whiskies. The product is produced, distilled, aged and bottled on the property.

With counterfeiting product becoming a global issue, particularly in the whisky industry, Robbie Gilligan, Business Manager and Brand Ambassador for OKD, said the company decided to take proactive action to protect its growing brand.

OKD implemented the HID Global IoT platform for brand protection, combined with the web application developed by local integrator AusNFC, to combat counterfeiting of its whiskies, premium gin and other liquor products.

"We were seeking the best brand protection technology available and a solution that would also allow us to securely engage with our customers, long after a sale. We believe that HID Trusted Tag Services and the support provided through AusNFC provide just that," said Gilligan.

The distillery's solution incorporates HID Trusted Tag Services into the AusNFC web application that drive the front-end mobile experience on customers' phones.

An HID cryptographically secure near-field communication (NFC) tag is embedded into the label of every liquor bottle, which links to HID's cloud authentication service.

By tapping their iPhone or Android phone to the bottle, the customer activates a secure communications channel that authenticates the provenance of their premium product — down to the actual bottle number.

Unlike QR codes, each tap generates a unique URL, preventing counterfeiters from copying, spoofing or



manipulating the URL for false verification.

"HID's IoT technology is enabling mass adoption of brand protection by major brands worldwide that are seeking to address more sophisticated attempts by fraudsters focused on imitating their products," said Mark Robinton, Director of Business Development and Strategic Innovation at HID Global.

According to Larry Hower, CEO of AusNFC, NFC technology is becoming more widely used and the solution is applicable to many different industries. "HID Trusted Tag Services is changing the game for authenticating brands and staying connected to buyers through a mobile experience," he said.

The NFC tags come in many form factors for a variety of product shapes and sizes requiring brand authentication. The tags are embedded into each product during the manufacturing process and are easily read using NFC-enabled smartphones (both Android and iOS v11 and newer). The advanced cryptographic capabilities of the embedded tags make them virtually impossible to be cloned or copied, and the extended security features in HID's cloud authentication service provide privacy-preserving brand authentication and consumer engagement in a closed and trusted environment.

"The brand protection solution from HID and AusNFC goes a long way in helping us preserve the uniqueness of our whisky and shutting the door to imitations," concluded Gilligan.

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## Helping manufacturers keep ice-cream safe

Product and safety group Tentamus has developed a guideline for good hygiene practices and HACCP-based procedures for ice-cream manufacturers, after a recent US Food and Drug Administration (FDA) report highlighted a number of safety issues at ice-cream facilities.

Between 2013 and 2015, there were 16 recalls of ice-cream products contaminated with pathogens and an outbreak of listeriosis at an ice-cream manufacturer. This prompted the FDA to carry out inspections and environmental sampling for *Listeria monocytogenes* and *Salmonella* at 89 ice-cream production facilities in 32 states between September 2016 and August 2017. The main objective was to understand the prevalence of harmful bacteria, and evaluate manufacturers' ability to deal with these hazards.

In a report on its findings, published in April, the FDA said no unacceptable conditions or practices were observed in almost half of the ice-cream production facilities studied. However, the FDA did find *Listeria monocytogenes* in 19 of the facilities — only one had the pathogen on a food contact surface — and *Salmonella* in one facility.

Under the Preventive Controls for Human Food rule, established by the FDA Food Safety Modernization Act (FSMA), establishments are required to have a written food safety plan based on likely hazards, such as these bacteria, and be able to verify their controls are working.

Although the FDA said the investigation took place before compliance to the Preventive Controls rules was necessary, it highlighted the need for ice-cream manufacturers to control hazards in accordance with it.

Frank Yiannas, FDA Deputy Commissioner for Food Policy and Response, said the findings resulted in three voluntary recalls in 2017 and 2018, and it has helped the inspected companies implement food safety plans designed to keep harmful bacteria out of their products. "These results serve as an important reminder to all food facilities distributing products in the US of the importance of complying with rules set forth to mitigate safety issues," he said.

To aid ice-cream producers, Tentamus developed a new guideline describing rules for good hygiene practices. The guideline also contains a template for HACCP-based procedures as well as numerous aids, such as example hygiene plans, checklists and documentation templates.

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## Process extraction and cleaning range

Dustcontrol has launched the Good For Food (GFF) process extraction and general cleaning range, which is suitable for use in the food industry.

The product line meets both the EU and the FDA requirements relating to safe and hygienic food production. It is also designed to help food processors with the management of material waste.

Thanks to the colour-coding of brushes and accessories, the risk of cross-contamination is minimised. All of the equipment has been designed for smooth handling and easy cleaning.

The GFF suction brushes have a unique combination of features including: colour coding, made from antistatic (ESD) materials, can be cleaned hygienically (autoclavable) and provide the possibility of automatic detection.

Apart from the suction brushes, Dustcontrol also offers a complete range of cleaning accessories and hoses that have been specially designed for the food industry.

The GFF pre-separator makes it possible for food producers to re-use materials that have been separated out, for example grain, flour, spices and other dry foodstuffs.

Dustcontrol's extraction and cleaning system for the food industry meets the following technical standards and regulations: (EC) No 1935/2004: Materials and articles intended to come into contact with food; (EC) No 2023/2006: Good manufacturing practice for materials and articles intended to come into contact with food; (EC) No 10/2011: Plastic materials and articles intended to come into contact with food; FDA (Food and Drug Administration) 21 CFR 174-178: Regulations for materials intended to come into contact with food; FDA 21 CFR 117.40: Good manufacturing practice for equipment and utensils; and EN 1.4404/AISI 316L: Stainless and acid-resistant steel.

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## Dissolved air flotation system

The Hydroflux HyDAF-HDV Dissolved Air Flotation (DAF) system has been specifically designed for applications where floatable suspended solids and FOG are combined with heavy solids or sand and grit which will rapidly fill and block a flat-bottomed DAF. It can also be used in applications where periodic emptying of the DAF to remove settled solids is impractical.

This V-bottomed DAF is designed with 60° sides and ends converging to a central screw conveyor mounted in the base where the heavier elements in the wastewater stream settle. The screw is designed to move the solids towards the drive end of the conveyor where either an actuated valve or pump is fitted to transfer the settled solids to the desired location.

The V series uses engineered external stuffing boxes to seal the bottom screw shaft which are tolerant of the potentially high grit application and simple to restuff without entry to the DAF tank.

The floatable FOG and light suspended solids are recovered in the DAF float which can be dewatered, composted or rendered subject to the application. The system can be operated with or without upstream chemical enhancement depending on the type of wastewater being treated and the performance required.

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# Choosing between wired and wireless

Maria Torrissi, JMartans Automation

There will be 30 billion Internet of Things (IoT) devices active by 2024 according to Statista, so lots of people are having to choose between two main methods of connecting new devices to the IoT — wired or wireless.

**W**ired automation is more mature than wireless technology and offers a fast and reliable option, while wireless technology is a newer entrant to the field, boasting reduced automation costs and smaller space requirements.

A good understanding of your technology and how to connect it is essential during any automation project. To choose the best form of connectivity for your application there are three primary questions to address.

## How much space do I have?

A wired system can require a large amount of cabling to connect components and devices, which can be bulky and expensive. One of the main advantages of wireless systems is that they can be installed in almost any location, even those where space is limited. To discuss which option is best suited to your facility you can arrange for a specialist to review your plant and recommend the best type of industrial automation equipment for you.

## How much am I automating?

If you are connecting a small number of devices to the IoT then wired technology is a good fit for your purposes, as the technology is fast and reliable. However, adding additional cabling or rerouting the existing cabling of a wired system can be incredibly challenging. Wireless systems therefore offer a more scalable option for businesses that are planning on expanding their level of connectivity in the future.

## Where's the value?

Wireless technology can offer a cost-effective option for businesses connecting a large number of devices. While the upfront costs can be high, the flexibility offered to growing businesses can lead to better value in the long term. However, if your company aims to automate a single part reliably and securely then wired automation can make good business sense due to its fidelity. Remember that the larger the wired network, the more expensive it is to install, maintain and manage.

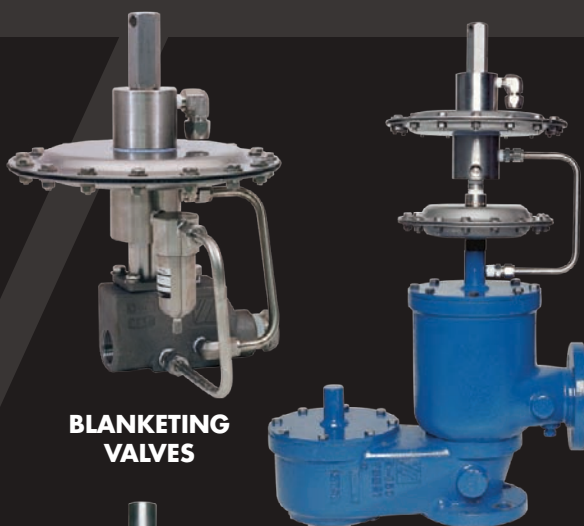
As the IoT continues to grow towards the 30 billion devices forecast by Statista, businesses are faced with decisions about how best to connect their equipment. While wired technology offers a trustworthy option, businesses looking to scale up their connectivity in the long term may find wireless technology is more suited to them.



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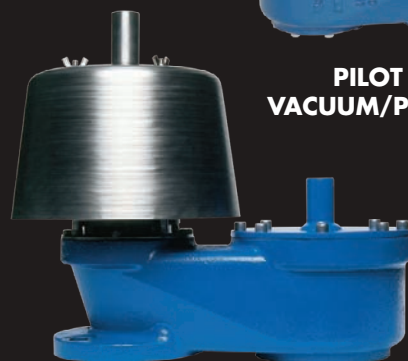
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## Pneumatically operated diaphragm valve

The externally piloted diaphragm valve type 2103 consists of a pneumatically operated piston actuator, a diaphragm and a 2-way valve for decentralised automation.

One of the most common necessities for manufacturing pharmaceuticals, cosmetics, food and beverages are diaphragm valves. What used to be a dull two-way race between forged and cast body variants is now being challenged by an exciting technology. The hydroformed, lightweight diaphragm tube valve body helps users create more sustainable processes while meeting the industry's demanding regulations. And during operation, it can increase overall productivity of the plant.

The externally piloted diaphragm valve type 2103 consists of a pneumatically operated piston actuator, a diaphragm and a 2-way valve housing made of cast stainless steel. The fully integrated system has a compact and smooth design, integrated pneumatic lines, IP65/67, NEMA Type 4X protection class and high chemical resistance.

The valve allows users to create more sustainable processes, regain valuable manufacturing time and increase overall plant productivity.

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## NIR spectrometer

The BUCHI ProxiMate is a robust, cost-effective NIR instrument designed especially for the food and feed industries. With chemical and mechanical resistance, the instrument provides users with fast, accurate data on essential parameters during various stages of food production.

Specifically, the NIR spectrometer enables accurate measurement of fat, protein, carbohydrate and moisture content for dairy, meat, grain, edible oil and feed processing applications.

It features IP69 Ingress Protection certification against water and dust, and has also been optimised for easy operation and cost-efficient sample processing.

Other features include: waterproof, stainless steel housing; autocalibration capabilities with targeted pre-installed calibrations; an intuitive touchscreen interface; and a user-friendly operating system with a report editor. It also meets the latest requirements of hygienic design and has been endorsed by the food hygiene agency HALAG.

The instrument has been standardised to allow for seamless integration with other BUCHI production line and laboratory NIR instruments as well as easy transfer from any other legacy spectrometers.

According to the company, the wide wavelength range of the machine allows for measurement of parameters that are independent of NIR such as colour and degree of bake or roast, as well as for improved calibration accuracy.

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## UQ licenses high-yield wheat variety

Australian wheat farmers, particularly those in Queensland, are set to benefit from a high-yield Mexican wheat variety identified by researchers from the University of Queensland. UniQuest has licensed it to Seed Exchange Australia (SEA) under the name SEA Condamine.

Originally from the International Maize and Wheat Improvement Centre in Mexico, it is a high-yielding, white-grained wheat with quick grain fill after flowering, good straw strength and resistance to leaf rust, according to SEA General Manager John Shepherd.

Associate Professor Mark Dieters in UQ's School of Agriculture and Food Sciences evaluated the wheat, and said trials showed it was suitable for northern NSW and south-eastern Queensland, but it was best suited to Central Queensland.

"SEA Condamine has demonstrated excellent adaptation to the wheat-growing regions of Central Queensland, with grain yield exceeding some popular varieties by as much as 10 to 20% in 2016 to 2018 national variety trials," he explained.

"This represents a significant improvement in yield potential compared to other main season wheat varieties.

"It is also demonstrating very good yield potential in the marginal environments of South West Queensland.

"Being a tall variety, growers are also able to reap the dual benefits from harvesting the grain and bailing the straw."

Shepherd said new wheat varieties being developed at UQ could benefit growers all over Australia.

"A portion of the sales of these new varieties will be fed back into research to help local farmers, support and inspire future agronomists, and help bush communities grow and benefit from this knowledge," he said.

"New wheat varieties like SEA Condamine help fund better breeding facilities and techniques, which leads to better-quality seed varieties for the farmers of the future.

"SEA Condamine currently has only a feed classification, but this year we hope to be rated for a milling classification based on the fantastic preliminary results from our baking trials, which show this wheat makes bread with excellent loaf volume and colour."



Image courtesy of UQ.

## R 5 PLUS – the intelligent solution for applications of Industry 4.0

The R 5 RA 0760 A PLUS belongs to the Busch product family of proven R 5 rotary vane vacuum pumps. As a fully integrated vacuum solution with advanced control and monitoring functionalities it is ready for Industry 4.0.



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## Natural protection against *Listeria*

Chr Hansen's SafePro uses good bacteria to inhibit the growth of the deadly *Listeria* bacteria.

The company isolated naturally occurring bacteria strains that can be sprayed onto high-risk foods such as processed meats, ready-to-eat meals, smoked salmon and pre-mixed salads at the time of manufacture.

The 100% natural bioprotective solution provides manufacturers and consumers with protection against illness as these bioprotective cultures continue to grow and keep working against the harmful bacteria. The bioprotective cultures could also reduce unnecessary food waste by extending products' shelf life.

**CHR Hansen Pty Ltd**  
[www.chr-hansen.com](http://www.chr-hansen.com)



## Pressure and level transmitters

The Noshok 20, 25 and 30 series of intelligent pressure and level transmitters is designed to address the specific requirements of the food and beverage industry. The transmitters are suitable for hygienic applications and harsh, aggressive ambient conditions.

The series features a good design that positions the pressure and temperature sensors directly behind the diaphragm, which minimises fill fluid and allows the use of a smaller diaphragm. This provides active temperature compensation at the point of measurement to minimise temperature and position error. Turndown ratios up to 10:1 allow greater rangeability, minimising inventory requirements. Accuracies are based on percent of adjusted span, not full-scale range.

Constructed of all-polished stainless steel, the transmitter series features programming via a standard onboard display with no pressure source required, and is available with Hart protocol. The series has a 360° rotatable display for flexibility and readability in multiple mounting positions.

The transmitters meet 3A requirements.

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## Data acquisition and protocol conversion

The Data Station DA10D and DA30D data acquisition and protocol converters from Red Lion are designed to bridge the communication gap between serial, Ethernet and fieldbus devices to unlock data from field equipment such as PLCs, drives and controllers.

Features of the range include point-and-click built-in MQTT connectors and embedded OPC UA server functionality to easily connect to cloud platforms as an IIoT gateway utilising the Red Lion's Crimson 3.1 software.

With a growing list of over 300 serial, Ethernet and fieldbus drivers, the Data Station provides the freedom to choose best-in-class components for a given application, regardless of vendor.

The protocol converter and data acquisition platforms can act as a part of any plant's industrial data collection, visualisation and management system, to provide real-time data from virtually any industrial equipment.

Additional options include a data, event and security logger with cryptographic signature support and SQL queries that can be executed periodically or on demand. The platform also offers an optional web server with mobile responsive design, full-screen display suitable for tablet or mobile viewing, HTTPS operation with the provision of certificates, HTTP redirect, CSS and JavaScript support.

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## Automatic cleaning system

KHS's fully automatic Innopro Craft CIP Skid cleaning system provides a new system for the supply of rinsing and cleaning media to the company's can, bottle or keg fillers.

It has an automatic recipe setting option. Around 230 L/min of caustic can be produced to sanitise system piping and fillers with a maximum of 60 valves.

The cleaning system also contains a fully automatic CIP media heating system, including chemicals dosing at the appropriate recipe-controlled concentration. This shortens cleaning processes, makes them safer and simpler, and allows beverage producers to save on resources such as water and energy during operation.

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# How to optimise food and beverage analysis

Today's food and beverages are much more than just simple 'organic fuels' needed for survival. With an ever-increasing number of processed foods, food quality and safety aspects are becoming more important. All the more, because foods are highly complex materials — prone to degradation and contamination — that contain myriads of compounds.

**A**nalytical chemistry makes sure that consumers obtain safe and sanitary food in compliance with regulatory requirements. From the process point of view, analytical chemistry supports the manufacturer to improve yields and optimise quality by offering robust, efficient and sensitive instrumentation.

Here are four ways to help manufacturers optimise their food analysis and meet the requirements of the public health regulatory authorities, from sample preparation, nutrient testing to labelling.

## 1. Test your salt — titration

In recent times, the negative impact of high levels of dietary sodium on human health outcomes has attracted increased attention from public health regulatory authorities. In many jurisdictions, there is a requirement for food manufacturers to state the total sodium content of the product on the package.

For large-scale contract labs, this can easily be analysed by AAS or ICP; however, these techniques require staff with analytical backgrounds and relatively high operation costs.

Smaller food producers or large-scale manufacturers without a large laboratory have opted for a simple titration using silver

nitrate to analyse salt. While this has been recognised as the titration method for salt analysis over a long period, it is actually an accurate representation of chloride, not of sodium.

To make performing titrations easier and reliable, it is recommended to use automated titration as it is more reproducible than manual titration. Automatic titration is more accessible and affordable. Metrohm's Eco Titrator Salt plus performs the analysis fully automatically and makes titration simple, safe and reliable. It provides users with a complete package for the analysis of chloride in a wide variety of samples and provides GLP-compliant results to meet the requirements of the public health regulatory authorities. Metrohm Eco Titrator is a titrator for all standard potentiometric titrations that is robust, precise and affordable.

## 2. Labelling requirements — allergen testing

All packaged foods sold in Australia and New Zealand must comply with the labelling requirements of the Australia New Zealand Food Standards Code. Current regulations and standards are used to safeguard food safety and ensure that consumers have quality products of high added value.





Food allergens and gluten are protein substances from different sources that can cause mild-to-severe immune reactions when consumed by sensitive individuals, even at low concentrations. Potentially allergenic foods are listed in Annex II of Regulation (EU) 1169/2011 and in bodies of regulation around the world, and labelling is compulsory.

It is estimated that 2 to 4% of adults and 6% of children have some kind of food allergy, a trend on the rise in recent years. Consequently, these substances must be detected in raw materials and finished products to ensure consumer safety.

To avoid a public health risk, food hazards are tested using a variety of techniques, among them, immunoassay due to its reliability, easy management and low cost. BioSystems' ELISA (enzyme-linked immunosorbent assay) kits are a rapid, efficient tool for analysing the

presence of substances at very low concentrations, due to the specificity of antigen-antibody binding reactions.

### 3. Sample preparation — homogenisation

Food products are available in a great variety of forms and consistencies and are usually inhomogeneous. To determine nutritional values or detect hazardous substances, for example, homogeneous and representative samples are required to obtain reproducible and meaningful results. Samples, which are often very complex, need to be homogenised and reduced to a suitable particle size prior to analysis.

Most analysis techniques only require a few milligrams or grams of sample material which must represent the entire original sample. The composition of the analysis sample may vary, depending on which part of the original sample it was extracted from. Muesli bars, for example, consist of a variety of ingredients which all need to be represented in the part sample to ensure correct determination of the nutritional values. This is achieved by thoroughly homogenising the cereal bars prior to analysis. Basically, the sample preparation process should be adapted to the sample characteristics as well as to the subsequent analysis technique to avoid falsified results.

Grinding parameters and accessories should be selected with regard to preserving the sample properties to be analysed. A basic rule is to only grind the sample as fine as necessary and not as fine as possible, as this always generates more effort (energy input, time, heat, wear). For a quick and reproducible homogenisation and characterisation of complex samples, it is

recommended to use mills and grinders suitable for the different requirements of food analysis.

RETSCH offers a variety of mills and grinders which offer results with minimum standard deviation, variable speed, autoclavable grinding tools and they are suitable for sample volumes up to 700 or 4500 mL. With simple and intuitive handling and quick and easy cleaning, the instruments help to increase efficiency in the food sample preparation.

### 4. Qualitative and quantitative analysis — Raman spectroscopy

In recent years, there has been a dramatic increase in the need for analysis of food quality and safety, as well as composition and authenticity of food products; all of which can be done non-destructively with Raman spectroscopy. A couple of examples include the presence of contaminants in food, and the identification of food additives and ingredients, including cellulose, sorbitol, stearic acid and starch. The composition of edible oils and the amount of fatty acids present in those oils is an important indication of their value as well as identity. Raman spectroscopy provides a means of quantifying the composition of fatty acids in food products, as well as other components in food, such as flavours.

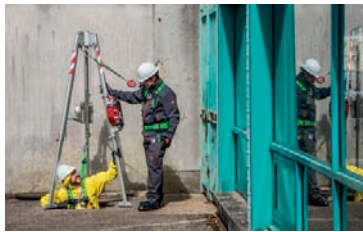
The Metrohm B&W Tek spectroscopy portfolio includes laboratory near-infrared spectroscopy (NIRS) analysers, and handheld and portable Raman analysers.

The nutritional composition of feed, including quantitation of protein in grain and fat in milk, can be determined using Raman spectroscopy:

- Measuring chain length and extent of saturation of fatty acids in edible oils
- Meat product quality analysis
- Product authentication and contamination
- SERS analysis of food contaminants including bacteria, antibiotics, dyes, etc
- Analysis of components in grain kernels
- Raw material identification/verification for the food and beverage industries.

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### Single tripod for confined spaces

The DuraHoist 3Pod is a single tripod adjustable to various confined space work situations.

The tripod is engineered to provide safe and reliable anchorage for the food and chemical, water utilities (sewer lines, pumping and treatment station), oil, gas, electrical and telecom industries.

Equipped with durable foot soles, the legs provide stability and maximum slip resistance to all ground surfaces.

The leg profile is ergonomic for hand grip and all legs open simultaneously with one knob fixing all legs together, making it safe, easy to transport and quick to install in less than 2 min.

Made of lightweight aluminium, it is adaptable to different manhole sizes between 1 and 2.5 m, and tested for 2 persons up to 140 kg each.

It is certified to the latest requirements of the EN 795:2012 class B (CN/TS 16415).

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### Oil-free screw vacuum pump

Leybold's NOVADRY oil-free screw vacuum pump is designed to ensure safety and efficiency in food and packaging processes.

The 100% dry pump follows hygienic criteria and increases safety in applications such as tumbling, filling, vacuum packaging and thermoforming. It also offers low cost of ownership, as less maintenance and spare part changes are required.

Normally, dry pumps are water-cooled, but the NOVADRY is air-cooled. This simplifies installation and commissioning.

The pump has a long uptime and achieves its performance over the entire pressure range and life cycle. This makes it suitable for simple applications that emit low amounts of humidity, such as packaging of cold products. The pump is also suitable for more demanding processes with large amounts of water vapour, for example, when hot meals with temperatures of up to 95°C have to be quickly cooled down by evaporative cooling.

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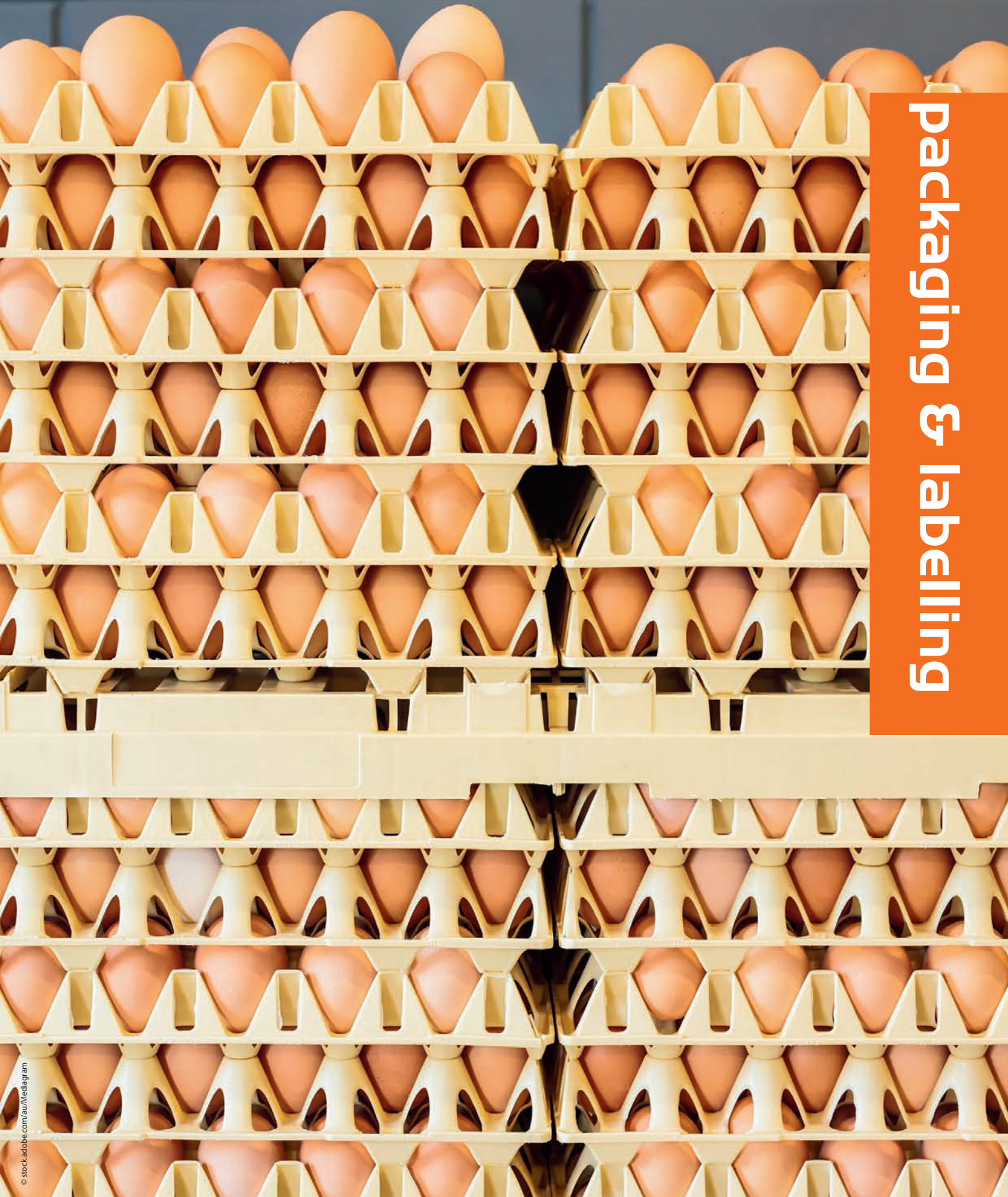


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# packaging & labelling





# Common ergonomic errors in food packaging

Miguel Campos, Advanta

The concept of ergonomics is simple; it describes the relationship between humans and the products they use. But poor ergonomics is a surprisingly common issue with modern food packaging. Miguel Campos from Advanta explains some common ergonomic errors in packaging design and how they can damage the consumer experience.

**E**rgonomics should perfectly marry a product's design with its intended use, providing a friendly and hassle-free experience for the user. For food packaging, the design should not only be intended to protect and encase the product during transportation, but should also make for an easier user experience for the customer. So, what should manufacturers consider before choosing packaging for their products?

## Temperature resistance

Today's consumers want packaging that they can place directly into the oven, without the need to remove the product and place it into a separate tray or container. As a result, aluminium packaging has become increasingly popular. Consider straight-to-oven trays as an example.

These foil containers are unaffected by extreme temperatures. Advanta's aluminium trays are capable of withstanding temperatures as low as -40°C and as high as 400°C. This temperature capability means the product can go straight from the fridge or freezer and into a roasting hot oven. Not only does this eliminate the need for consumers to handle raw foods, but also saves precious preparation time for today's time-strapped customers.

A common issue with plastic packaging is that it can split or crack under freezing conditions. Similarly, paper and cardboard based containers often become brittle and lose rigidity when frozen and subsequently defrosted. Choosing aluminium ensures the material will not shatter in extremely low temperatures, which is particularly advantageous for customers who want to freeze their food.

While not all products are designed for home freezing, busy schedules mean that many families need to freeze products to avoid food going to waste. When choosing packaging, consider temperature resistance as a necessity.

## Getting the size right

Portion size is at the forefront of every food manufacturer's priorities — it enables them to set nutritional guidance, raw material orders and the prices of their products. But, what about the size of packaging? Simple considerations, like whether the package fits into a standard domestic oven, can sometimes be overlooked, but can lead to disastrous consequences.

Let's say you have launched a new ready meal to the market. This product has been designed to be baked in

the oven in 12 minutes or microwaved in as little as four. However, customers are complaining. When cooking in a small-sized microwave, the tray gets stuck on each rotation. As a result, the food inside is not being cooked correctly and thoroughly.


A lukewarm microwave meal might be a first-world problem, but this design flaw can damage the customer's trust in your brand. Let's face it, if the consumer purchases a meal for its microwaveability, but can't efficiently microwave the meal, it is unlikely they will choose the same product again.

## Fit for purpose

A common mistake that manufacturers make is assuming the same packaging will be suitable for every product, but that is not the case. Let's say a manufacturer is releasing a range of three meals for oven baking. If one contains heavier ingredients, such as meat, it is likely that the meal will require sturdier packaging than the others.

While straight-to-oven trays would be ideal for this range, the convenience of this product would be diminished if the aluminium bends and splits under the weight of its contents. Manufacturers should also consider how the rigidity of the tray could change during cooking. For example, if the tray weakens after exposure to high temperatures, it may need to be made from stronger material to avoid breakage when removing it from the oven.

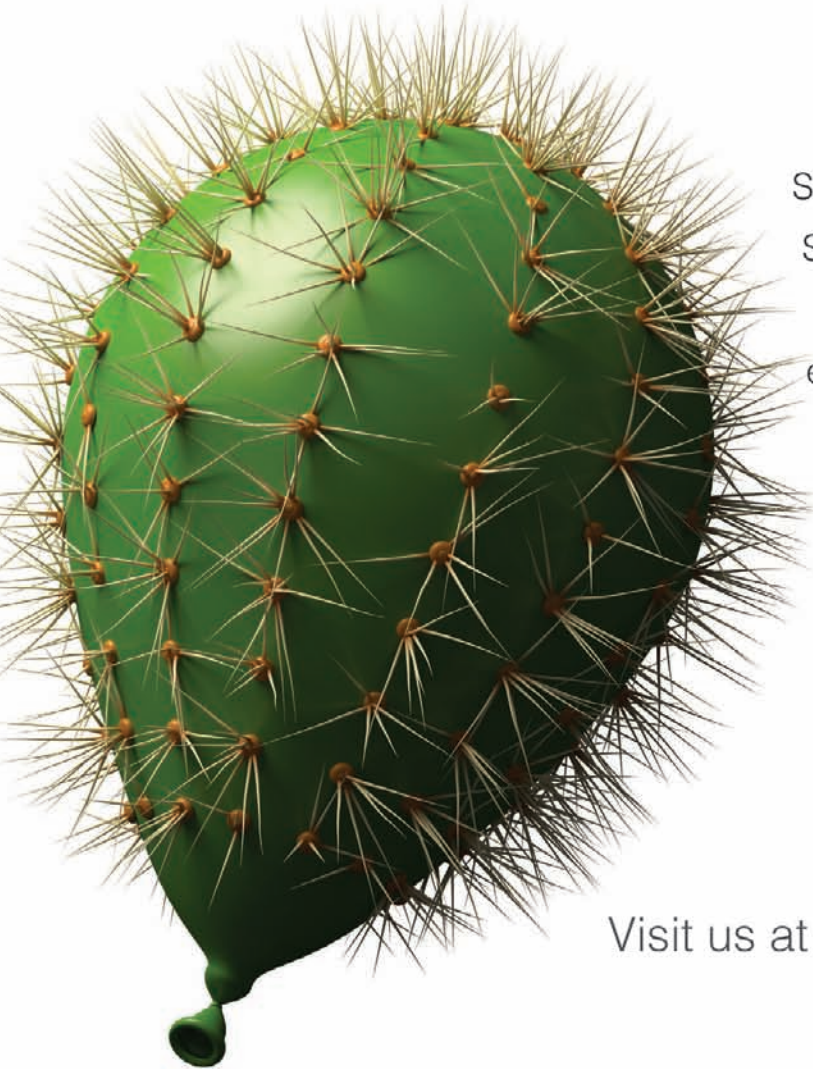
Ignoring this flaw could not only create an awful mess for the customer, but could cause injury if hot contents were to splatter from the tray. Packaging suppliers should be able to advise on weight restrictions of packaging to avoid this problem. It's also worth asking about additional options that can alleviate these issues, such as reinforced aluminium or the addition of handles for steadier handling.

Good ergonomics can be the difference between a product's failure and success. Despite this, poor packaging selection is all too common in the food manufacturing realm. Manufacturers would be foolish to believe that the taste of their product is the only factor consumers care about. In fact, today's consumers want ease of use during the entire cooking process — from picking up the product in the supermarket, to serving it onto the plate. 



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## Smart packaging expected to grow globally

The electronic smart packaging market is expected to reach \$1.8 billion in 2029, and almost 39 billion packages sold in 10 years' time may be enhanced by an electronic feature, according to IDTechEx research.

The 'Smart Packaging 2019–2029' report noted that the ageing population, wealthier consumers, better product identification systems and increasing home delivery of groceries are some of the key drivers for smart packaging. It looks at how technologies related to packaging are being developed and used to grow brands and provide consumers with value-added benefits.

For example, there is increasing traction with RFID in packaging. The Japanese Ministry of Economy, Trade and Industry (METI) has announced, alongside the leading Japanese retailers, that they seek to tag 100 billion retail items in Japan in 2025, provided the tag price point is appropriate. In part, this is driven by a lack of young people in the workforce in Japan, and they do not want those people deployed in unproductive roles, such as scanning products at a supermarket till. Several retailers are already trialling automated checkouts in stores in Japan and China using RFID tagged products. Others achieve the same with sensor fusion, combining RF location technologies with machine vision — enabled by inexpensive cameras developed for smartphones. Amazon has several such stores in the US which eliminate tills.

Payments are changing too, with the rapid rise of QR codes in China, bypassing the need for smaller retailers to have card processing machines and obtain credit merchant status. Apps such as WeChat and AliPay can send the money to the retailer immediately once the QR code has been read. However, the report said this success is localised.

Tagged items in stores are boosting sales by providing better stock control, and IDTechEx also sees a trend to dual-frequency RFID tags where consumers can use their NFC phone to interact with the product. New technologies have now come to market including flexible integrated circuits which will help to further reduce the cost of NFC labels, making it applicable to tagging more things.

The report also discusses chemical smart packaging technologies, including time temperature and freshness indicators.



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# Ensuring product quality and safety in the dairy industry



Processing and distributing dairy products necessitates a high level of quality control and strict adherence to regulatory requirements. It is paramount that dairy products are safe for consumption, free of a range of potential bacterial and physical contaminants.

The goal is always to keep consumers safe and protect the brand's reputation while managing pressures to contain costs and operate efficiently.

Dairy product safety and quality can benefit from the use of inspection/detection equipment. There are multiple places on the processing and packaging line where installing these systems can positively impact the quality, accuracy and safety of the food item being marketed.

The specific inspection solution is dependent on the product characteristics, placement in the line (before or after packaging) and inspection/detection objectives.

Selecting the right inspection, detection technology depends on product attributes and materials, as well as the production environment

Historically, detecting foreign objects in dairy products has been challenging. Traditional metal detectors are often fooled by what is called a "product effect" in cheese and other high-moisture, high-salt dairy products. These products have conductive properties that affect the magnetic field and trick the detector into generating a signal indicating metal is present when it is not. Accordingly, dairy producers tend to deploy them for a limited group of products, such as novelties and other liquid-fill items. They

are also found in gravity applications for dry powders, but a lack of product consistency can cause problems.

The Thermo Scientific™ Sentinel™ Multiscan Metal Detector utilises an innovative new technology to overcome the limitation of fixed single or dual frequency metal detectors that can miss metal contaminants hidden in product signals. Multiscan technology scans a combination of up to five user selectable frequencies from 50 to 1000 kHz. This enables users to identify contaminants that are up to 70% smaller in volume than was previously detected on single and dual frequency detector technologies, reducing the probability of escaping detection to near zero. It is like having five metal detectors in one, to provide unmatched sensitivity and the highest probability of finding ferrous, non-ferrous, and stainless steel metal contaminants in challenging dairy applications with high product effect.

Overcoming the product effect in metal detection in dairy inspection

All metals, whether iron, stainless steel, brass or aluminium, react differently to an electromagnetic field, which is the principal underlying metal detection in products. These reactions change based on shape, size, orientation and position. Add to this unwanted electrical interference and vibration effects found in production facilities and you have the potential for metal foreign objects to go undetected. Dairy products have additional challenges created by moisture, salt and high mineral concentration that can create a strong

product specific signal that may mask detection of smaller signals generated by contaminant.

The Sentinel detector offers an entirely new approach to this challenging problem. You no longer must pick the "best" frequency for an application or try running some combination of fixed dual frequencies. Instead, you select 1, 2, 3, 4, or 5 frequencies, to screen your product and test any/all the types of contaminants of concern to see which frequencies work best. The Sentinel detector immediately shows what is happening at each frequency such as signal levels, detections and changes in phase angle. If one frequency seems to be doing all the work, simply adjust it to see if you can do better. If there is noise on a frequency or it doesn't provide protection in your application, disable it. It is that easy, fast and flexible.

When metal detection doesn't work

In applications where the Sentinel multi-frequency metal detector is unable to meet the inspect requirements Thermo Scientific recommends X-ray inspection. X-ray systems now are also easier to use, more reliable and more affordable whilst providing additional capacity, not only finding foreign materials but checking for quality defects such as missing or broken components.

For more information:  
[thermofisher.com/SentinelMD](http://thermofisher.com/SentinelMD)

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## Colour label printer

Label Power has announced the water-resistant VP750 Memjet colour label printer.

Printing full colour labels at 6" or 12" per second,

the VIP Color VP750 is suitable for full-colour, on-demand label printing for all industries.

**Label Power Pty Ltd**

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

## Metal and X-ray detectable plastic additives

Eriez's PolyMag additives impart metal detectability, X-ray contrast and magnetic susceptibility into plastic mouldings to prevent plastic contaminated food products from reaching the consumer. The product makes plastic as detectable as metal.

The company provides the additives in a non-dusting pellet, allowing moulders and extruders to produce metal detectable and X-ray visible plastic parts for food contact applications. Moulders can satisfy varying levels of detectability at a lower cost than specialty compounds. This eliminates the need to buy minimum quantities of special resins and carry excess material inventory.

Major restaurant chains insist that food processors utilise plastic and rubber articles that are metal and X-ray detectable. This has become part of many companies' HACCP (Hazard Analysis Critical Control Point) programs.

Eriez Magnetics' FDA compliant PolyMag additives impart metal detectability, X-ray contrast and magnetic separation into a range of polymers. The company supplies these masterbatch additives to moulders of returnable plastic containers, pallets, scoops, scrappers, O-rings, conveyor belting, bucket elevators and more. It also provides PolyMag powders for special compounding needs or for use in foam, thermoset rubber and liquid raw materials.

Eriez can assist users with the level of detectability and X-ray contrast required by different food processing applications and it can provide an analysis of the product's inspection signature.

**Eriez Magnetics Pty Ltd**

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



## Chewing gum packaging

Mondel z International was seeking a standard pack for the launch of its Trident chewing gum brand into the German market that could be produced within a short timeline.

Working together, the RPC Bramlage and RPC M&H Divisions devised a solution combining two standard products — the 100 mL Pharma bottle from RPC Market Rasen (M&H Division) with the Pharma Secure closure from RPC Massmould (Bramlage Division).

The round Pharma bottle is lightweight and easy to handle with a large decoration area for effective branding. The Pharma Secure closure incorporates a tamper-evident band for product security and features a finger lift for easy opening by the consumer.

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# Meet Millie:

## glass bottle boosts nutritional understanding



A collaboration between glass container manufacturer O-I Glass, the Australian Beverages Council, brand agency VOICE and Monash University has created an innovative glass packaging solution called 'Millie'. Australian brand Emma & Tom's will launch fruit juices in Australia and China in the new bottle.

**M**illie is a 250 mL glass bottle designed to contain precisely two servings of fruit in the form of no sugar added fruit juice. It is aimed at consumers who are conscious of the Australian Dietary Guidelines for fruit and vegetables, which recommend eating at least five portions of vegetables and two portions of fruit (or 2 serves of 125 mL) daily.

Students from Monash University Faculty of Art, Design and Architecture were tasked with designing a glass packaging solution that could help people understand how their beverage consumption could help them meet daily nutritional requirements.

O-I's Australia New Zealand Business Development Manager Bayard Sinnema said, "It was extra challenging for the students as the design needed to fit within our operational parameters, and packaging design parameters outlined by our design agency VOICE, and also solve the real-world health problem of people meeting their daily recommended servings of fruit."

The students had the opportunity to visit an O-I glass manufacturing plant and present their ideas to O-I and VOICE, supported by the Australian Beverages Council, to develop and refine their understanding. Contract Monash Teaching Associate and Communication Design Consultant Melinda Coombes said presenting at a professional level was "utterly invaluable" for the students, and the feedback they got was "pivotal to the students' development and thinking". She explained: "O-I could provide technical knowledge and rein the students in where needed, which resulted in creative yet viable results."

The practical experience the students gained through such industry engagement is essential for any contemporary design



school, according to Dr Gene Bawden, Interim Head of the Department of Design at Monash University, as it allows for experimentation and teaches life skills such as how to communicate, collaborate and pitch an idea.

"In practical terms, they were learning about a material that they can only access with a real company that manufactures it. You cannot pretend to know about glass unless you're actually working with it, such things as the shapes that are possible and an accurate understanding of quantities. The material knowledge gained through the project was really great.

There were also other important lessons such as the constraints of closure systems, the language that's used on labelling and legal requirements and how to design for a range of different retail and operating systems... It's not just about the product that the consumer picks up, it's about how the project works in an entire system from manufacture to the store," she said.

Millie was the winning design, and once O-I has completed trials, Emma & Tom's plans to launch a range of premium chilled fruit juices and smoothies in the bottle.

"Our intention is that we will be selling product in Millie bottles into China initially, where there is a strong move away from juice in plastic to juice in glass, particularly in leading hotels. We will also be launching the product in Australia," said Emma & Tom's co-owner Emma Welsh. "We are seeing a definite shift with consumers leading the change in the market away from plastics. Glass provides a strong fit with the health and sustainability values that are central to our business and is the best and most sustainable choice for packaging our juice."



O-I Asia Pacific  
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## CO<sub>2</sub> laser coding

Compact and powerful, the Domino D320i is designed to deliver a reliable and flexible CO<sub>2</sub> laser coding solution for high-speed and high-quality applications onto substrates including glass, PET, film and carton.

Utilising Domino's i-Tech technology, the D-Series provides a compact, IP65 (washdown-compatible), high-performing solution for the most demanding of applications. Its compact footprint makes it suitable for challenging space constraints and heavy integration within larger systems such as labellers, flow wrappers and carton formers.

The i-Tech scan head is the fastest of its kind without compromising on quality, according to the company. The RapidScan technology is designed to provide up to 20% faster speeds with the same laser power, avoiding potential requirements to move up the range for more challenging applications. It has the capability of producing multiple lines of text at 1500 characters/s (30 W model).

The modularity of the system means key components can be installed in the appropriate locations without compromising the user experience or requiring the application to suit the laser. These modular components are connected with quick-release connections, making changes quick and efficient.

The low running costs, permanent high-quality print and performance of the Domino D-Series laser makes it a suitable partner for a wide variety of high-performance industries including food and beverage, manufacturing and pharmaceutical.

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# Designing to leave nothing behind

Alan Adams, Sustainability Director, APAC

**With the war on packaging waste, together with 2025 global packaging targets, it's fair to say that the food packaging industry is busy finding new ways for smarter packaging.**

**T**he strong media focus on 'end-of-life' for packaging means consumer awareness and demand for green solutions is growing, along with the increasing concerns that packaging is ending up in our landfill and oceans.

While efforts to reduce end-of-life impact are certainly critical, the significance packaging plays in protecting food and reducing food waste is often underestimated. So as we get busy finding new smarter ways for packaging, where exactly should we be focusing?

Designing food packaging for longer product shelf life and product protection is a non-negotiable. Resources need to be optimised and end-of-life taken into account. Well-designed packaging takes full life-cycle into account, end-of-life cannot be considered in isolation of the primary role of packaging.

Reducing, re-using and recycling are great ways to make a smart difference. But the best way is to embrace the opportunity to re-design, reinvent and change the status quo. For example, fresh proteins packed in a modified atmosphere tray lid configuration require absorbent pads to retain product purge. In fact, across ANZ's fresh meat sector, more than 750 million soiled pads end up in landfill each year. Rather than redesigning the pad to make it recyclable and thus address 'end-of-life' concerns, a total rethink of the solution gave rise to a new sustainable way. Sealed Air's Cryovac HydroLoQ barrier tray is a new concept where product purge is retained by the purposefully designed cavities in the tray, thereby eliminating the need for a soaker pad. The recyclable tray offers extended product freshness and shelf life and with no soaker pad to dispose of, Cryovac HydroLoQ is designed to leave nothing behind.

Another example of redesign and reinventing is the gradual evolution from modified atmosphere packaging technology to vacuum skin technology, which offers a step change to our food value chain. Cryovac Darfresh for example is proven to at least double shelf life of fresh red meat, enhance logistic

and retail efficiencies and offer an enhanced consumer experience. Extended shelf life of this magnitude means less food waste, less packaging waste and it means better profits for our processors and this means better business sustainability. Not to mention the best eating experience available.

Smart design means smart for everyone along the value chain, from processors to retailers and consumers. While down gauging (reducing) ticks one box, its benefits cannot be negated by poor operational throughput, down time and lost profits. Cryovac OptiDure is a great example where traditional barrier shrink bags have been re-engineered to use less material, drive improved abuse resistance, and improve operational efficiency and throughput. And once the product is opened, consumers can place the shrink bag into polyolefin recycling streams. A holistic approach to packaging design will yield the best outcome, but a design around end-of-life only is a flawed approach. The noise around end-of-life alone should not dictate future packaging design and development.

Beyond saving food and delivering operational excellence, smart design must also take into account product and consumer safety. As we commit to including recycled content into 'direct food contact' packaging, we cannot simply introduce a new recycled element into a redesign without proper validation. This is not an area of guesswork and must be validated from a regulatory perspective, ensuring it meets all necessary food law requirements.

According to a recent survey\*, ANZ consumers agree that re-sealable packaging is the best way to reduce household food waste. The findings also show that packaging has a reputational impact on the supermarket. More than 45% of ANZ shoppers state they would react positively to a store promoting their food items as being packaged in a way that optimises food freshness.

To reduce is priority, but whether we design for reduce, re-use or recycle, the full product lifecycle must be at front of mind when designing packaging. A smart design that yields a sustainable outcome for all of our value chain is a fail-proof way of leaving our environment in a better place than which it was found. And that's a stronger story we should all own.

\*Sealed Air Study – Consumer and Retailer Perceptions of Food Packaging and Food Waste

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# bulk handling storage & logistics



## CASE STUDY

### Fruit specialist leaves nothing to chance

Fruit Gourmet has had 25 years' experience selecting the best dried fruit and carefully rehydrating them, using just the right proportion of water to give plump, shiny and delicious results. With prunes, for example, this is exactly 35%.

The European fruit specialist recently selected an Ishida X-ray inspection system for enhanced quality control. The decision to install the machine follows the success of Ishida multihead weighers at the site.

#### The challenge

Because of careful supplier selection and long processing experience, products such as Fruit Gourmet's shredded apricot rarely contain contaminants. However, the Ishida X-ray inspection system, already highly sensitive, can be set to even higher levels of sensitivity for the contaminants that have historically been known to occur in such agricultural products, such as minute particles of glass, stone or buckshot.

#### The solution

One aspect that particularly appealed to Fruit Gourmet was the Ishida's image processing software which enables the operator, without any special training, to automatically generate the optimal sensitivity setting for each inspected product. Hygiene was another factor, with the IX-GA's design practically eliminating areas in which product can build up. The adoption of X-ray technology continues Fruit Gourmet's relationship with Ishida, which began in 2014 when it was decided to create a new packing line for bagged products with target weights of 50 to 500 g.

Fruit Gourmet supplies a variety of fruits including prunes, apricots, figs, grapes, mangoes, strawberries, raspberries, apples, blueberries, bananas and cranberries, sold to the consumer as cooking ingredients and as healthy snacks, packed in bags as well as in bulk. The Ishida IX-GA-2475 X-ray model is being used for the inspection of bulk streams of the fruit pieces.



A well-known slogan of Fruit Gourmet has the product itself saying "I am not the fruit of hazard", meaning that its level of quality did not just happen by chance but is the result of many years of experience combined with excellent raw materials, expertly selected.

CEO Emeric Cadalen sees the security offered by the new Ishida X-ray inspection system as just one more extension of this approach, in which nothing is left to chance.

The company put this project out to tender, resulting in the acquisition of a 14-head multihead weigher from Ishida. Ishida won the tender because its proposed model was closely matched to the needs of rehydrated fruit packing. Measures to keep the sticky products moving smoothly through the weighing process included steeply sloping surfaces,

with dispersion cone, dispersion table and all hoppers specified in embossed stainless steel and with the timing hopper beneath the weigher equipped with scraper gates.

Speed of cleaning was another success factor. Key points here were the open, accessible structure of the weigher and the fact that contact parts can be lifted off and replaced by hand without tools. The proximity of Ishida technical help was a third decisive factor for Fruit Gourmet.



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## CASE STUDY

### Deli salad plant benefits from efficient pumps

Eight MasoSine Certa pumps from Watson-Marlow Fluid Technology Group (WMFTG) are boosting operational efficiency at Flensted Food Group, a Denmark-based specialist in deli salad products. Flensted is owned by Wersing Feinkost GmbH, one of the largest deli salad manufacturers worldwide, with production plants in seven countries and 4000 employees.

Flensted has turned to MasoSine Certa pump technology. The pumps are suitable for handling the delicate ingredients used in these increasingly popular products — such as chicken, mayonnaise, coleslaw and chickpeas — providing a low-shear, gentle pumping action.

“To help pump ingredients such as coleslaw, chicken, mayonnaise, chickpeas, mustard spread and barbecue sauces, we rely on eight Certa pumps, which are located on small trolleys so they can be easily moved around the large production floor, and into different manufacturing halls,” explained Maintenance Manager Martin Kristensen.

There are many reasons why Flensted opted for MasoSine Certa pumps, not least because they are able to cope with varying viscosities up to 8 million centipoise. In addition, the single rotor design of the pumps maintains constant volumetric displacement throughout the pumping cycle, providing a smooth and consistent flow profile without the pulsation spikes associated with rotary pumps.

Sine pumps also offer advantages over many other types of positive displacement pumps, such as piston pumps, which are prone to damaging solids, while AODD (air operated double diaphragm) pumps have a pumping action that frequently ‘splits’ bases such as mayonnaise. Ultimately, a trouble-free manufacturing process is a must at deli salad plants as downtime can have costly implications for both the end product and production.

The low shear and gentle action of a MasoSine pump provides the ability to maintain the integrity of solids such as diced vegetables, fruit, nuts, coleslaw and eggs, as well as bases like mayonnaise and dressings. The pumps feature up to 50% less energy consumption for the same flow in comparison with



other pump types, and good suction so cavitation is eliminated.

“We are very happy with our eight Certa pumps, which get the job done quickly and efficiently,” Kristensen said.

Deli salads at Flensted need to be manufactured in high volumes, and due to the nature of the ingredients, shelf life is often relatively short.

Cleanliness and ease of cleaning are other advantages of Certa pumps. Offering EHEDG Type EL Class I as well as EHEDG Type EL Aseptic Class I and 3A certification, the pumps provide full CIP (clean-in-place) capability. As well as minimising downtime, this quick cleaning procedure also ensures that chemical and water use are reduced, which in turn means less wastewater that requires disposal and the production uptime is increased.

“The ease of pump cleaning is outstanding,” Kristensen concluded. “We have semi-CIP cleaning procedures in place, and the Certa pumps are always cleaned quickly, even after pumping very viscous mayonnaise at 20,000 cP.”

Watson-Marlow Fluid Technology Group  
[www.wmftg.com.au](http://www.wmftg.com.au)





## Vibration monitor

The NetterVibration VibroScanner is a portable, handheld vibration monitoring unit.

It is used to measure the acceleration and dominant frequency of mechanical vibrators by means of an acceleration sensor. The capacitive micromechanical sensor has high mechanical strength, and the signal processing takes place in the housing, reducing the possibility of electrical interference.

The acceleration (RMS), dominant frequency and the stroke (peak to peak) are clearly displayed, and can be held on the display at any particular point of the measuring cycle.

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## 3-wheel electric forklift trucks

The Mitsubishi series of 3-wheel electric forklift trucks is designed for the logistics and warehousing industry, providing clean and robust power with nearly maintenance-free operation.

With its compact design and good manoeuvrability, the FB13-20TCB series is suitable for confined working areas such as narrow warehouse aisles and containers. Equipped with a 48 V battery, efficient AC Power traction and hydraulic motors and regenerative systems, the trucks are suitable for daily operations.

All FB-TCB series forklift trucks are installed with the AC Power control system, which provides for more powerful and advanced capabilities by integrating travel, hydraulic and electric power steering functions into one cohesive system.

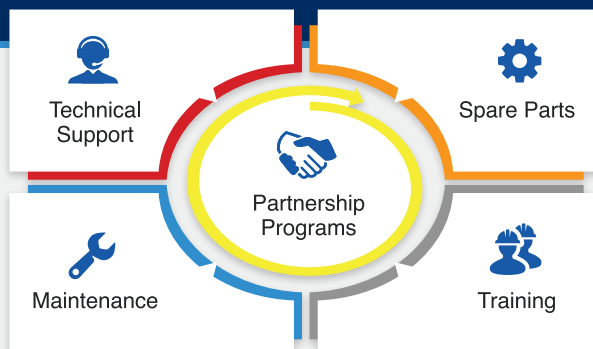
While these trucks are suited to indoor applications where noise, pollutants or particulate contamination is undesirable, they also now come with a higher IPX4 rating, which means the forklift and its systems are protected against water spray from all directions and angles, making them safe to operate in rain.

The FB-TCB series is particularly effective in creating good working conditions for its operators, featuring electric power steering, good visibility, ergonomic controls, comfortable seat and good leg room.

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## CASE STUDY

### Making a mark on pop-art inspired craft beer



Edinburgh Beer Factory is benefiting from improved codes, reliability and ease of use with the Linx CSL30 laser coder from Linx Printing Technologies.

The craft beer company currently uses the device to code 'Best before' dates and batch codes on its automatic bottling line, which processes around 2000 330 mL bottles per hour. The device has the potential to handle more production and new bottle sizes as the business continues to expand and enter export markets.

Taking inspiration from Edinburgh-born Pop Art-founder Eduardo Paolozzi, the company demands high aesthetic standards for its bottles and therefore requires impeccable codes that do not detract from their visual appeal.

Using a laser coder provides benefits as it uses no ink and as a result there is no drying time involved or risk of smudging — problems the company found with its previous coding solution.

"For various reasons, our original coder for batch and date codes wasn't quite right for us," explained Martin Borland, Head Brewer at Edinburgh Beer Factory. "We started looking into alternatives and laser technology fitted the bill.

"When you process 2000 bottles per hour, you need to be confident that your BBEs and batches are being printed, and the Linx coder gives us this. Everything we wanted — cleaner codes, more reliability, the potential to grow — we now have. It's even more cost-effective than our previous coder.

"Most importantly, we're now confident about the future because we know the machine can go faster if we need it to, and from running successful trials, we know it works well on larger bottle sizes too."

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## NEWS

### 'Smart glove' could help robots get a (better) grip on objects

Robots could one day achieve greater precision and dexterity in food and object handling thanks to a new 'smart glove'.

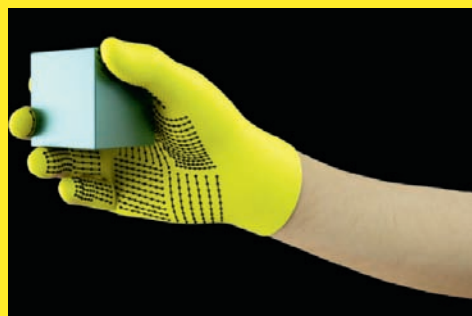
The glove — developed by US researchers — contains 548 sensors which feed data to a deep learning network. The network then uses this information to identify objects, estimate their weight and respond to tactile feedback.

To get the data, researchers wore the glove and recorded themselves handling a variety of objects, including a horned melon, tea box, coin, spoon and mug to create a tactile 'map' which allowed the network to recognise objects based on the way they were held.

The method takes advantage of humans' proficiency in manipulating objects based on their weight, shape and hardness without dropping or breaking them — an ability which is difficult to engineer in robots.

While research into vision-based grasping strategies has progressed substantially, little data existed on the tactile information humans rely on when grasping objects.

However, the glove's simplicity, scalability, ability to be used over long intervals and low cost has allowed the researchers to generate a large dataset that complements vision-based robot-object handling and could inform future robot design.







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## The physics of granular material flows

Despite the variety of practical applications, the physical laws that govern how granular materials behave are only partly understood. However, the opposite is true in the case of liquids — a number of well-established physical laws and mathematical instruments are used to describe their behaviour. This is particularly true for unstable, complex mixtures, such as emulsions, which have structures that quickly rearrange themselves.

Sand, coffee grounds and rice behave very differently to water or oil, but under certain conditions they will suddenly exhibit astonishing similarities.

Researchers from the group led by Christoph Müller, Professor of Energy Science and Engineering at ETH Zurich, in collaboration with scientists at Columbia University in New York, have discovered that under certain circumstances, mixtures made of granular materials exhibit striking similarities to mixtures of immiscible liquids and can even be described by similar physical laws.

To carry out their experiments, the researchers placed heavy and light grains in different configurations in a narrow container, which they vibrated while simultaneously passing air through it from below. These two processes 'fluidised' the grains, so that they began to behave similarly to liquids. From the outside, the researchers then observed how the materials in the container rearranged over time.

If, for example, a layer of heavy sand is placed on top of lighter sand, fluidisation will cause the lighter grains

to migrate upwards due to their lower density and form globule-like structures much like viscous liquids. "The grains actually behave similar as oil in water would," explained Christopher McLaren, a doctoral student in Müller's group. "A complex interaction occurs between the two materials."

If a small quantity of light sand is embedded in heavy sand, the light sand will more or less move upwards in compact globules. However, in heavy sand, a more complex pattern emerges: a ball of heavy grains, surrounded by light grains, will not simply sink to the bottom intact. Rather, it will gradually disintegrate into several smaller globules, and the material will continue to branch out as time passes.

"Our findings are significant for several applications," said Alexander Penn, a postdoc involved in the experiments. "If, for example, a pharmaceuticals manufacturer wants to produce a very homogeneous powder mixture, it has to understand the physics of these materials in detail, so that it can control the process." The findings are also likely to be of interest to geologists, helping them to better understand the processes involved in landslides or how sandy soils behave during earthquakes.

Moreover, the work will also be relevant to improve energy efficiency. "If you analyse industrial processes, you can see that a significant share of the needed energy is used to process granular materials," explained Penn. "If we know how to better control granular materials, we can develop more energy-efficient manufacturing processes."

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# Retrofitting food plant motors in the digital age

In 1969, the first home security system was born, consisting of four peepholes and a camera that could be moved to look through any of them, broadcasting the images to a monitor. Nowadays, we can stream and view a feed of our home security cameras on our mobiles, giving homeowners greater piece of mind. Markus Brettschneider, of ABB's food and beverage program, explains how food plant managers can add a similar level of connectivity to retrofit most motors with smart sensors to bring their plants to the digital age.

Industry as a whole is using technologies and solutions enabled through the Industrial Internet of Things (IIoT). Gartner predicts that 25 billion devices will be connected to the Internet of Things by 2020, with some agencies predicting even double this amount.

This presents plant managers with a conundrum. Most food manufacturing and processing plants currently have motors powering essential equipment such as mixers, conveyors and packaging machines. These motors are just motors and do not play in the same league as the other intelligent devices in their factories.

With years of service often left in the motors, it's difficult for plant managers to justify replacing motors that work effectively for the sake of an upgrade with any smart features. However, there are alternatives to a complete overhaul in order to connect motors to the IIoT.

Instead of investing in new, more intelligent or smart equipment, plant managers can invest in sensors that provide

similar functionality to connected devices. For example, ABB offers smart sensors, which can be fitted to almost any standard low-voltage induction motor. The pocket-sized sensor, dubbed ABB Ability Smart Sensor, is directly attached in a couple of minutes to the motor's frame, without wiring.

By using sensors that feed performance data to the cloud through a smartphone or gateway solution to a secure server, plant managers can bring their motors up to date with the IIoT. This data gives plant managers a full picture — even on mobile devices — of how their motors are working, without having to carry out dangerous hands-on monitoring. Plant managers can then carry out condition-based or predictive maintenance, rather than periodic maintenance.

Using the right method to monitor motor condition enables plant managers to reduce unplanned downtime by up to 70%. This is particularly important in the food and beverage industry, where even a short downtime can be extremely costly. Infrastructure failures in this industry cost up to \$75,000 per hour and have a serious impact on seasonally produced items such as sugar. This is a cost that plant managers can avoid by using the right performance insight and awareness.

An increased awareness of the condition of any motor also leads to a better awareness of how an entire system is performing. For example, a motor overheating or burning out may indicate a problem elsewhere in the production line, such as a line moving too fast and producing waste. Eliminating this problem could improve energy efficiency by up to 10%.

Motors, the heart of the food and beverage plant, don't have to be left behind in the age of the IIoT. Just like a home security camera being connected to your mobile phone, a smart sensor could give a motor a new lease of life, making it perform as an integral part of the data-rich factory and providing all the additional benefits that this creates.



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### Vacuum lifter

The Schmalz Jumbo Low-Stack is a vacuum lifter that ergonomically picks up cardboard boxes, metal goods or sacks from pallets that are close to ground level. The handling solution, which is also suitable for reaching into transport containers such as grid boxes and crates, is based on the modular system of the vacuum tube lifters JumboErgo and Sprint.

It has a load capacity of up to 80 kg when working with airtight workpieces, and the stroke has a range of 1400 to 800 mm.

The product lets the user pick up and put down workpieces near the ground while maintaining an upright posture. The user controls upward and downward movement by turning a vertical handle, which glides through their hand during lifting. This gives the user complete control throughout the entire lifting process.

It is equipped with a release function that eliminates the residual vacuum between the gripper and the workpiece. The user can release the suction cup from the workpiece without exerting any extra force.

Various suction cups for gripping different workpieces safely are available. The quick-change adapter makes it easy to adapt them to the application.

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### Food-grade conveyor

Hygenius is food-grade conveyor that has been designed from first concepts to reduce flat surfaces, cracks and crevices where food and bacteria can accumulate. It is fast and easy to prepare for cleaning and is fully washdown ready.

Customers in the meat, poultry, seafood, fruit and veg and smallgoods markets are mindful that food hygiene is playing an increasing role in their production processes. A food contamination scare has dire consequences on a business's reputation and profitability.

Having equipment that is easy to clean to hygienic standards is critical to reducing food contamination risks. The Hygenius food-grade conveyor has been designed to meet European Hygienic Engineering Design Group (EHEDG) standards including the minimisation of cracks and crevices where food and bacteria can accumulate. A key feature is how easy it is to clean, including its rapid preparation for cleaning. Most conveyors can take in excess of 30 minutes to disassemble to prepare for hygienic cleaning; Hygenius takes only two minutes to disassemble and reassemble for cleaning. It achieves this through its purpose-built design which allows for tool-less preparation.

Fabricated in stainless steel and using EHEDG certified components, including belts, bearings, motors and feet, Hygenius is suitable for raw meat, poultry, seafood, smallgoods, fruit and vegetable and dairy producers who need to protect their customers from food contamination risks.

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## CASE STUDY

### Abattoir chooses pumps for easy maintenance

Darling Irrigation turned to Hydro Innovations for pumps that were reliable, were easy to maintain and ensured operator safety for the new North Bourke Abattoir.

Darling Irrigation supplies solutions for irrigation, domestic water systems, mining hydraulics and stock watering, with a staff of around 50 across four locations in western NSW and one in Launceston.

The company recently undertook a contract for the design and construction of water and wastewater infrastructure for the North Bourke Abattoir. It approached Hydro Innovations for solutions using Gorman-Rupp self-priming pumps.

There were five applications for a total of nine pumps, from 'kill floor' hose down to pond storage transfer and effluent pumping. As some of these applications contained abrasive media in the pumped water, Hydro Innovations offered pumps with Gorman-Rupp 'hard iron' internals to reduce wear rates and lengthen the intervals between servicing.

As well as providing reliability and longevity in tough pumping conditions, the self-priming pumps could be mounted at ground level so that operators have easy and safe access for monitoring and maintenance, without the need for cranes.

Phil Chegwiddden, Project Manager on the job for Darling Irrigation, said he was impressed by the easy installation, quick priming and smooth operation of the pumps. He said he could understand why many abattoirs have standardised on Gorman-Rupp pumps for their wastewater systems.

Hydro Innovations  
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## Drought impacts Australia's farm production

The value of farm production is expected to decline by 4% to \$58 billion in 2018–19, driven largely by droughts in the eastern states and poor winter crops, according to the latest Agricultural Commodities report by ABARES.

However, ABARES' Chief Commodity Analyst Peter Gooday explained that high prices and the near record crops in Western Australia provided a significant buffer, and agricultural production is predicted to increase over the next few years.

"Many would have predicted a greater fall in agricultural production given the significance of the drought along the east coast," Gooday said.

"Western Australia is forecast to have produced its second-largest grain crop — nearly 60% of the Australian winter crop this year — which has helped make this the sixth straight year of above average performance.

"Improved commodity prices have helped, with grain prices expected to increase 11% in 2018–19 and contribute to a 3% rise in farmgate prices. Wheat prices rose by 5% and barley prices by 16%."

The report, launched at the Outlook 2019 conference in Canberra, forecasts agricultural production will increase by 2% to \$59 billion in 2019–20 and grow to \$61 billion by 2023–24, provided seasonal conditions returned to normal.

The National Farmer Federation (NFF) aims to lift the value of Australian agricultural production to \$100 billion by 2030, but ABARES Executive Director Steve Hatfield-Dodd said this requires making tough choices. He listed five key areas that are vital to meeting this goal: ensuring agriculture is attractive to workers and investors; harnessing innovation to boost performance; promoting on-farm resilience and risk management; persisting with water reforms; and respecting and responding to evolving consumer expectations.

While farm profitability is expected to be lower in 2018–19 compared with the previous two years, the report suggested it remains comparatively high.

"The average farm cash income for all broadacre farms is projected to fall by 18% to \$173,000 per farm in 2018–19 — still well above the 10-year average of \$140,000.

"There is substantial regional variation though, with average incomes down by an average of 51% on New South Wales broadacre farms and by 21% on Queensland farms.

"In Western Australia farm incomes are projected to increase by 33% to \$490,000 per farm in 2018–19," Gooday said.

Export earnings experienced an expected 6% decline in 2018–19 due to falling crop exports, and falling livestock exports are also predicted to cause a decline to \$45 billion in 2019–20.

"This will be partially offset by an expected 4% increase to export prices," Gooday said. "Export earnings are then projected to increase to \$47 billion by 2023–24."

The report explained escalation in trade tensions dampened activity in China, which is the country's largest market, but strong income and population growth in emerging Asia are expected to support demand for Australian agricultural exports to 2023–24.

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## NEWS

### John Dee upgrades its regional cold store

Construction has begun on the John Dee regional cold store in Warwick, which will upgrade the existing abattoir and reduce operational costs, expand storage capacity and increase product sorting capabilities.

Brisbane-based international project delivery company Wiley will deliver the regional cold store and ASRS (automated storage and retrieval system) facility solution with minimal impact to production.

The project — which was brought to life by funding from the Australian Government's Building Better Regions Fund — aims to increase flexibility in picking product for orders and handle a high number of product variants with a focus on operational workplace health and safety.

"This expansion will not only protect the 630 existing jobs, it creates 143 new full-time jobs and 138 indirect new full-time jobs," said Maranoa MP and Minister for Agriculture and Water Resources David Littleproud, who attended the recent sod-turning ceremony. "Securing \$4.8 million for this facility will help bolster employment opportunities in our region. Export opportunities from this development will come to about \$111 million."

John Dee has four generations of experience in the beef industry and the investment in this facility will enable the business to continue to support the local community into the future.

The Mayor of Southern Downs Regional Council (SDRC), Tracy Dobie, said, "John Dee is one of the region's largest employers and its expansion shows great confidence in the future of the local livestock industry. This is a positive step forward as the Southern Downs continues to grow and prosper."

"Not only does the project boost the economy with local jobs during construction, by an estimated 80 people, but it also provides a valuable asset to the future of the business. We're looking forward to bringing together local subcontractors and suppliers to assist in delivering the facility upgrade," said Wiley's Chief Operating Officer, Robert Barron.

The project is expected to be completed in late 2019.



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# Safeguarding Australia's fresh food industry

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**T**he University of Sydney has launched a specialist training hub that will train the next generation of industry-ready food safety researchers and develop methods to safeguard Australia's fresh food and agricultural industries.

The Australian Research Council (ARC) Training Centre for Food Safety in the Fresh Produce Industry consists of a multidisciplinary team of academics with research areas spanning genome editing, water management, horticulture, pathogen detection and food safety.

"Working with a multidisciplinary team and a range of industry partners, the centre will be working towards improving commercial food safety practices, whilst minimising and preventing food safety risks such as human pathogen outbreaks," said Centre Director and Professor of Horticulture Robyn McConchie. "As our population grows and our country's role as a global food producer increases, futureproofing our food supply and competitiveness through scientific and engineering advancements is a welcome move."

Dr Kim-Yen Phan-Thien from the School of Life and Environmental Sciences will take on the role of Director with the support of McConchie, drawing on her experience in the systematic analysis and optimisation of food safety and quality.

Research into food safety culture aims to identify strategies to promote organisational cultures that prioritise food safety beyond regulatory compliance, even in the absence of an outbreak. She explained food safety culture influences how people interpret and implement policies and procedures as well as what individuals prioritise, which has a major impact on food safety.

"The development of robust methods to analyse food safety culture and to validate this against processing and safety indicators is a big challenge, but it's also what makes this work exciting. It will require bringing together rigorous analytical approaches from the fields of both natural and social sciences, and business, as well as close collaboration


with our industry partners," Phan-Thien said. "Food safety in the Australian fresh produce industry is regulated predominantly by private standards. However, there's a strong and growing interest in how we can get past a 'compliance culture' of box-ticking to instead develop a culture of food safety at all levels of a business."

Researchers play an important part in developing safety practices and maintaining integrity within Australia's agricultural and food-production industry, according to University of Sydney Vice-Chancellor Michael Spence.

"Maintaining food safety in our supply chains is crucial for the future of Australia and our region. The new training centre is a tremendous opportunity for the university and our researchers to work and learn from real-world professionals who are already grappling with these issues," he said.

Climate change, shifts in dietary behaviour and growing populations are impacting the way food is cultivated and distributed. CSIRO Agriculture and Food Deputy Director Professor Martin Cole said: "To build resilience it's essential we invest in the technology, science and practices which allow us to innovate all levels of supply chains, to decrease risks of foodborne diseases, strengthen our future food supply and promote Australia's economic growth within this industry."

Professor Brian Jones from the School of Life and Environmental Sciences agreed, and suggested that genome editing can help futureproof food supply. He suggested it is possible to enhance natural plant resistance to pathogens using CRISPR to make very small changes to the existing crop genome. "Plants already have innate immunity to pathogens and other stressors. We are able to bolster plant performance by making small, targeted changes to their genetic make-up."

The ARC Training Centre for Food Safety in the Fresh Produce Industry is funded by the Australian Government and industry partners, and is administered by the University of Sydney. 



## VSD liquid ring vacuum pump

The Atlas Copco LRP 700-1000 VSD+ range of intelligent liquid ring vacuum pumps is suited to wet, humid and dirty applications. It uses a state-of-the-art vacuum solution and is a compact, high-performance, energy-efficient system enclosed in a strong, noise-containing canopy.

The uncomplicated plug-and-play product has an ergonomic design with HMI to ensure the optimum operator interface and ease when controlling the vacuum pump.

The soundproof housing reduces noise pollution in the immediate working environment, with operating noise in the range of 65 dB(a). Along with noise reduction, the sturdy canopy and cubicle ensure that the pump and internal electronics are effectively protected against dust and water.

The twin VSD system operates in absolute harmony within the pump, ensuring optimal vacuum performance at all times. The primary VSD maintains required vacuum levels by controlling the operating speed of the pump, matching pump performance to process demand and saving energy. The second VSD regulates the water circulation pump in response to the operating conditions.

Equipped with Atlas Copco's MkV Elektronikon controller, the LRP VSD+ has a comprehensive in-built plant management system. Key information such as pump status, operating conditions, warning alarms and maintenance information is readily available. Multiple pumps can be monitored, controlled and optimised simultaneously. It can also be paired with Atlas Copco's SMARTLINK, the LRP VSD+.

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## CASE STUDY

### Packaging system protects palletised organic products



Organic food manufacturing company Davert GmbH installed the BEUMER stretch hood to protect its products from dust and pests during storage and to ensure they are safely transported to drug and health food stores.

Based in Ascheberg in Germany, Davert specialises in organic foods — including rice, legumes and cereal products like sugar, dried fruit, nuts, oilseeds and sprouting seeds — and stands for the continuous further development of processing methods and careful monitoring of these products, from cultivation to packaging. The BEUMER stretch hood A covers the mixed pallets of bags, cartons and buckets with a highly elastic stretch film, protecting them against external influences and keeping them secured during transport, even through sudden braking.

Davert acts as a consultant for its partners when it comes to product selection and cultivation, and coordinates infrastructure projects. It follows a multichannel strategy: the merchandise is sold via its own online shop and in selected greystores and health food retailers.

Erwin Tenbrink, Technical Director at Davert, said: “We are ensuring the highest degree of cleanliness to meet our strict quality standards.”

Before being shipped out, the products have undergone special quality controls. The company’s 150 employees examine the incoming raw products and set up the required cleaning steps. In one mill, for example, air flow from the aspiration channel removes stalk remnants, husks and dust from the cereal. Different-sized grains are separated using screens. Weed seeds and light particles like defective grains are also weeded out by the system; an optoelectronic sorter removes the foreign particles.

“Another preventive measure is the pressure treatment that we use to prevent any pest infestation from the start,” explained Tenbrink. “The sudden pressure release kills off any pests like bugs, moths or mites and their larvae and eggs, without compromising the quality of the product in any way.”

In compliance with the quality assurance process, employees pack the merchandise in a variety of ways, depending on the product: rice, flour, linseed and grains are packed into bags, larger storage quantities into big bags. Packaged legumes, nuts, dried fruit and muesli are filled into boxes, and honey into buckets. Depending on the store order, the team stacks the various unit loads onto mixed pallets which are stored in its high-rack warehouse. The units also have to be loaded safely onto the back of the trucks and reach the distributor without any damage.



Davert was looking for a solution that could meet all these requirements, ensuring fast and reliable operation, high levels of availability, easy maintenance and a small footprint. BEUMER Group delivered the BEUMER stretch hood A high-capacity packaging system.

"The machine is very easy and safe to operate," said Volker Feldmeyer, Sales Engineer at BEUMER Group. "In order to make work easier for the maintenance personnel, which also means higher levels of availability, the machine does not require any platform."

Maintenance work, such as changing the blades or the sealing bars, is handled at floor level. The operator simply opens a drawer, providing free access. Additional benefits include the compact design and the resulting low height and small footprint.

A film transport system, which is particularly gentle on the material, introduces the previously cut and sealed film hood into the system. On its way to the crimping and stretching unit, the sealing seam on the film hood cools down so that it can be crimped without losing time. Energy-consuming cooling units and delayed cooling times become obsolete, meaning the pallets can be packed in a shorter cycle time. Economical engines and a lower demand in compressed air optimise the energy balance.

In order to save resources and produce minimum waste, Davert opted for this type of film wrapping. The palletised goods are also clearly visible through the smooth surface of the transparent, highly flexible film. The wrapping protects the merchandise against atmospheric influences and humidity, increases safety

during transport and ensures an aesthetic appearance on the shop floors.

At Davert, the BEUMER stretch hood A packages the pallets for high-bay storage systems: the pallet base remains unwrapped, so that the forks of the forklift truck won't damage the film. This prevents any remaining film from interfering during the contour check before the pallet is stored in the high-rack system.

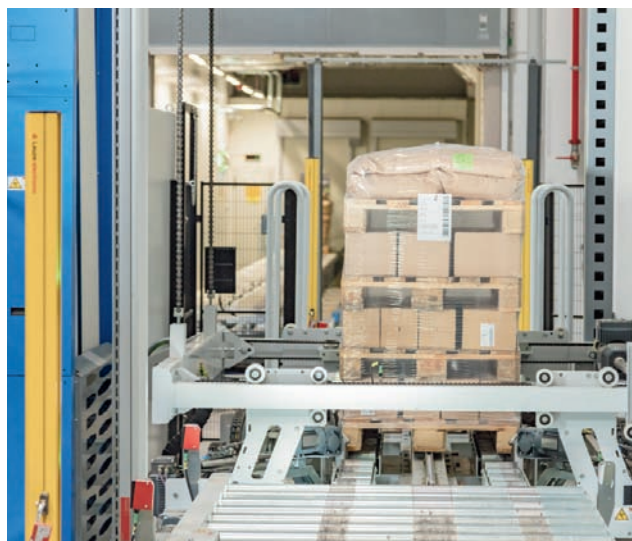
The BEUMER Group introduced the human machine interface (HMI), an operator panel with an optimised user interface and graphical navigation which offers a more ergonomic workflow to the user. This easily understandable and intuitive interaction concept helps to define efficient working sequences.

"The soft-touch panel uses pictograms to guide the user through the menu of the Siemens SIMATIC S7 machine control," explained Feldmeyer. "The panel also gives the operator access to all required training programs and content."

Tenbrink noted the technical cooperation during the planning and installation of the system, and the reliable customer support for maintenance and service.

"If necessary, we send our service personnel to the plant to check the system and perform any required adjustments," Feldmeyer said. "This way we can ensure high levels of availability at any time."

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# Mislabelled or fraudulent seafood

With 30% of seafood on the international market found to be incorrectly labelled when tested<sup>1</sup>, the Marine Stewardship Council (MSC) has revealed the causes and implications, and how it is working to eliminate substitution and fraud in the industry.

**A**nne Gabriel, Oceania Program Director for the MSC, a global non-profit that sets a benchmark for sustainable fishing and traceable supply chains, will be speaking about this topic at the upcoming Asia Pacific Food Safety Conference in Sydney, organised by risk management company SAI Global.

“That such a significant proportion of the consumer seafood market is affected by substitution and fraud highlights the complexity of global food supply chains, which are inadequately regulated, and the challenges in monitoring every step. Substitution and fraud risk the sustainability of our global fishery resources, business reputations and consumer trust,” Gabriel said.

Gabriel explained the two major causes of mislabelling: a motivation to boost profits and accidental mislabelling.

“Competition for low prices has motivated some food manufacturers to take shortcuts and make cheap substitutions. Scientific investigations have repeatedly revealed higher rates of mislabelling among premium products, such as wild-caught king salmon, in order to boost profits.

“Often, seafood is unintentionally mixed with different species at various points along the supply chain. This could be the result of poor systems or simply a lack of knowledge on the need for maintaining a traceable supply chain and to meet gaps in supply.”

She said the implications can be alarming and wide ranging. Firstly, mislabelling can incentivise illegal, unreported and unregulated fishing, estimated to cost the global fishing industry up to \$33.8 billion a year.

Secondly, the trade of vulnerable or endangered species can go undetected. Thirdly, mislabelling deceives consumers

and can result in consumption of fish species that come with health warnings. Lastly, consumers might also be unwittingly purchasing less sustainable seafood options.

**The APAC Food Safety Conference will be held at Doltone House, Sydney on 20–22 August. Other speakers will include:**

- Dr Craig Shadbolt, Food Incident Response & Complaints Manager at the NSW Department of Primary Industries, who will discuss ‘Recent Outbreaks with High Risk Horticulture’.
- Michelle Robertson, Senior Food Scientist at Food Standards Australia and New Zealand, who will discuss ‘Review of Food Safety Management Requirements in Australia’.
- Felipe Favaro, General Manager at Hemp Foods Australia, who will discuss ‘Hemp Foods & Food Safety, Challenges and Opportunities’.
- Mark Field, Head of Coles Brand, who will discuss ‘Consumer Demands Driving Product Innovation and Emerging Food Trends’.
- Craig McGrath, Detective Inspector at Queensland Police Service, who will discuss ‘Police Investigative Perspective — Lessons Learnt’ on the strawberry tampering incident in Queensland.
- Krista Watkins, Food Waste Innovator at Natural Evolution, who will discuss ‘Minimising Food Waste’.

For more information, visit: [www.foodsafetyapac.com](http://www.foodsafetyapac.com).



1. Pardo M.Á., Jiménez E., Pérez-Villarreal B. Misdescription incidents in seafood sector. *Food Control*. 2016; 62: 277–283.

SAI Global  
[www.saiglobal.com](http://www.saiglobal.com)

## Pest protection in grain storage

BOGE's BLUEprotect is a container solution to protect against pests in grain storage. It uses nitrogen from the ambient air which removes the oxygen from the silo and therefore takes away the means of survival for pests and fungi.

The method is carried out without any chemical agents, is harmless in food production and does not cause environmental damage. It is suitable for organically cultivated products and brewery suppliers.

The processing is straightforward for the user: the company arranges all plant components in a container so it can be placed flexibly, without special prior knowledge and in different types of silos.

**Boge Compressors Ltd**

[www.boge.net.au](http://www.boge.net.au)





## CASE STUDY

### Drive belts overcome problem for NZ poultry processing plant

Optibelt has solved a long-running problem for a New Zealand poultry processing company located in Auckland, with the introduction of its Omega HP drive belts to a major poultry grader within the plant.

Operating in a cold and humid environment, the grader is driven by a rubber 600 5M 25 HTD timing belt, operating 16 hours a day, five days a week. The constant load on the machine had caused the timing belt teeth to shear after just two weeks in operation resulting in severe disruption to production and maintenance downtime.

The Optibelt Omega HP 600 5MHP 25 belts are claimed to transmit up to three times the power over the standard belt along with good wear characteristics. The new belts at the plant now last in excess of four months before replacements are necessary on a preventive maintenance program, eliminating further disruption to production and costly downtime.

Optibelt New Zealand General Manager Paul Luff said: "The dimensionally stable construction of the Omega HP belts with their high flexibility and very low residual and elastic stretch



of the cord make them ideal for this application. They have low friction and excellent abrasion resistance with high shear strength suitable for low- and high-speed high-powered drives and steady loads."

According to Optibelt, the Omega tooth profile also results in a significant reduction in the noise level as the polychloroprene material teeth on the belt are moderately resistant to humidity and are formed to ensure they match perfectly with minimal friction into the pulley teeth.

*Optibelt Australia Pty Ltd*  
[www.optibelt.com.au](http://www.optibelt.com.au)



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## Compact ejector for vacuum gripping systems

The Schmalz SCPM compact ejector combines powerful suction with straightforward integration directly into the vacuum gripping system thanks to its slim, lightweight design.

With optimised power density and compact dimensions, the ejector can be used close to the suction cup. Up to 16 ejectors can be easily blocked to form a compact pneumatic unit with just one connection. This means that users can set up and individually control this number of vacuum circuits with one device, allowing different parts to be handled independently of one another with only one terminal.

Using different modules, three different versions can be created with just one main body. In addition to the basic version SCPMb, there is also a 'c' version — where 'c' stands for 'controlled'. With additional features such as the automatic air-saving function and active blow-off, this version reduces compressed air consumption during handling by more than 80%.

The intelligent 'i' version of the SCPM also offers numerous functions for monitoring and controlling the entire production process. The SCPMi version is equipped with an IO-Link interface and NFC (near field communication) and transmits all relevant process data clearly to mobile devices and computers.

**Schmalz Australia Pty Ltd**  
[www.millsom.com.au](http://www.millsom.com.au)

## Automated sampling solution for VOC analysis

The Thermo Scientific TriPlus 500 Gas Chromatography Headspace Autosampler is designed for high sample throughput for routine VOCs analysis by pharmaceutical, food safety and environmental scientists.

With a scalable, compact design, the unit is efficient and capable of handling samples at high throughput.

Features include: data reproducibility and sample integrity; automated 24/7 operation for results with minimal operational expense; validated method transfer capabilities, which help streamline method conversion; effective purging to practically eliminate the residual signal of heavier and polar compounds, for minimal carryover; correct results and injection repeatability through advanced pressure control in both the vial and sampling loop prior to column transfer; and efficient heating of the sample path, which protects against the risk of high boiling solvent contamination and supports the robustness of the system.



**Thermo Fisher Scientific**  
[www.thermofisher.com.au](http://www.thermofisher.com.au)

## Splice press

Flexco's Novitool Aero Press offers splice times of 8–12 minutes.

The all-in-one unit has no external components such as water tanks and pumps, making it lighter and easy to transport. It features intuitive HMI control panel and scroll-through navigation.

A USB port loads recipes for future use and allows for storing and sharing more than 1000 recipes between tools and across locations.

It has independent temperature settings for top and bottom plates to easily follow recommended splice parameters.

The 150 mm effective heat zone across the entire tool width eliminates unfilled fingers. The integrated air cooling system with top and bottom fans cools the belt quickly after cooking for increased splice quality and reduced cycle times.

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## Drive solutions for digital automation

NORD Drivesystems manufactures drive solutions (hardware and software) and supports customers with its communication and application know-how in the Industry 4.0 realm.

NORD's intelligent, networked drives enable continuous condition monitoring and form the basis of predictive maintenance. In addition, they offer intelligent digitised production, advanced maintenance concepts and new services.

All NORD drives are Industry 4.0 ready and can be directly integrated as active components in Industry 4.0 environments.

According to company, the drive units are compatible with all common field buses and Ethernet-based protocols and provide analog and digital interfaces for sensors and actuators. They can also be connected to various external cloud systems.

Due to continuous monitoring of the field level and linking of communication, sensors, process data and vital parameters of the drive, deviations from the normal state can be quickly detected.

Condition-oriented maintenance replaces time-based maintenance. This results in user benefits such as an increase in plant availability, prevention of unscheduled downtime and improved planning of service and maintenance.

NORD is currently investigating sensorless monitoring of oil ageing and the condition of geared motors with virtual sensors. The aim is a predictive maintenance concept which determines the optimum oil change and maintenance intervals for each individual geared motor, oriented to the actual condition of the geared motor and the gear oil.

**NORD Drivesystems (Aust) Pty Ltd**  
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## Valorising waste in dairy processing the European way

In a bid to valorise waste in the dairy processing industry, AgriChemWhey is testing and proving the techno-economic viability of converting agriculture and agri-food waste into sustainable lactic acid through innovative technology at the first-of-a-kind biorefinery.

Whey Permeate (WP) and De-lactosed Whey Permeate (DLP) are major by-products of dairy processing and represent a key challenge for the dairy industry due to a lack of reliability in current disposal routes and represent a sustainability bottleneck for the expansion of milk production in Europe in the post-milk-quota era.

AgriChemWhey is an EU-funded project that is seeking to tackle the dairy waste issue by building a never-before industrial-scale biorefinery in the South East region of Ireland that will have the capacity to valorise over 25,000 tonnes (100% dry matter) per annum of excess WP and DLP.

The project will establish a new value chain for industrial symbiosis with other local actors and create several added-value products for the global market including lactic acid, polylactic acid, minerals for human nutrition and bio-based fertilisers.

Representing the first major industrial venture to convert residues from food processing, the flagship plant in Ireland will scale up a unique fermentation processes of WP/DLP-to-lactic acid by reducing the fermentation time to a 12-hour process, optimise the upstream processes of DLP and WP and optimise the downstream steps for simplified novel LA purification to industrial scale.

In a bid to enhance the circular bioeconomy through agriculture and agri-food waste, AgriChemWhey will also develop a blueprint of an economic sustainability concept so that other EU regions can replicate the plan.



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## KEYNOTE SPEAKERS



**Professor Gustavo Barbosa-Canovas**  
Professor of Food Engineering and Director of the Centre for Nonthermal Processing of Food (CNPF) at Washington State University, USA



**Professor Bart Nicolai**  
University of Leuven, Belgium



**Dr Grace Douglas**  
Advanced Food Technology Lead Scientist, NASA



**Dr Christoph Hartmann**  
Academic Alliances and Expertise Development, Nestlé



**Dr Tristan Hunter**  
GM Automation and Operational Technology, Fonterra Co-operative Group Ltd



**Professor Karin Schroen**  
Wageningen University & Research, Netherlands



**Dr Silvia Estrada-Flores**  
Principal Consultant, Food Chain Intelligence



**Professor Xiao Dong Chen**  
Distinguished Professor and Head of School of Chemical Engineering, Soochow University, China



**Dr Lana Zivanovic**  
Global Innovation Protein Program Director, MARS Petcare

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# Sniff test

## technology for meat and fish products

Use-by dates and even the good old 'sniff test' are currently used by consumers to see if their food is safe to eat. Now researchers based at Imperial College London have developed laboratory prototype sensors costing just two US cents each, which could make these food test methods a thing of the past.

TESTING

**K**nown as 'paper-based electrical gas sensors' or PEGS, the technology detects spoilage gases such as ammonia and trimethylamine in meat and fish products.

Existing food spoilage sensors are not commonly used because they're either too expensive (often comprising a quarter of overall packaging costs) or too difficult to interpret. Colour-changing sensors could in fact increase food waste as consumers might interpret even the slightest colour change as 'bad food'.

The researchers who developed PEGS made the sensors by printing carbon electrodes onto readily available cellulose paper. The biodegradable materials are eco-friendly and nontoxic, so they don't harm the environment and are safe to use in food packaging. The sensors are combined with near field communication (NFC) tags — a series of microchips that can be read by nearby mobile devices.

During laboratory testing on packaged fish and chicken, PEGS picked up trace amounts of spoilage gases quickly and more accurately than existing sensors, at a fraction of their price.

The researchers say the sensors could also eventually replace the 'use-by' date — a less reliable indicator of freshness and edibility.

Lead author Dr Firat Güder, of Imperial's Department of Bio-engineering, said: "Although they're designed to keep us safe, use-by dates can lead to edible food being thrown away. In fact, use-by dates are not completely reliable in terms of safety as people often get sick from foodborne diseases due to poor storage, even when an item is within its use-by.

"Our vision is to use PEGS in food packaging to reduce unnecessary food waste and the resulting plastic pollution."

Features of the PEGS technology include:


- Function effectively at nearly 100% humidity, where most sensors struggle above 90%.
- Work at room temperature and do not need to be heated, so they consume very low amounts of energy.
- Are sensitive only to the gases involved in food spoilage, whereas other sensors can be triggered by non-spoilage gases.

### What's next?

The researchers used ballpoint pens and robotic cutters to create the sensors. Dr Güder said: "We believe our very simple technique could easily be scaled up to produce PEGS on a mass scale by using existing high-volume printing methods such as screen printing and roll-to-roll printing."

The authors hope that PEGS could have applications beyond food processing, like sensing chemicals in agriculture and sensing air quality, and detecting disease markers in breath

like those involved in kidney disease. However, before they can be applied beyond their current use, the researchers hope to address how sensitive PEGS are to lower humidity.

Next, the authors hope to expand the usefulness of PEGS by applying them to other types of food and industries. They are currently developing an array of PEGS in which each sensor detects a different chemical. Using this technique, the array will give unique signals for different gases and/or changing humidity, which would make the technology applicable to a wider variety of food types and applications. 

The research was published in *ACS Sensors* and the work was funded by the Engineering and Physical Sciences Research Council (EPSRC).

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## Electric tongue can improve taste testing of spicy foods

An electronic tongue, or e-tongue, can taste test spicy food more accurately and quickly than humans, according to researchers from Washington State University (WSU).

This is because spicy food wears out humans taste buds quickly, meaning they struggle to distinguish differences in taste after a few bites. People need to wait at least five minutes between samples, and only a few samples can be tested at a time because the lingering spiciness can impact results. An e-tongue, however, does not face the same limitations.

Published in the *Journal of Food Science*, WSU researchers compared consumers' and the e-tongue's ability to discriminate among paneer cheese samples containing different levels of capsaicin. They found that the e-tongue resulted in a high degree of discrimination of 93% among all samples.

"At low concentrations, or low spiciness, it's hard to discriminate between two samples," said recent WSU graduate student Courtney Schlossareck. "It's also hard to tell a difference between two samples at high concentrations."

Its ability to accurately differentiate between the spicines of samples of the same food may be useful for food manufacturers. Schlossareck explained the e-tongue could work alongside human taste testers to speed up the process. She said the technology would "allow testers to narrow a selection down to two or three samples for a human tasting panel if they start from 20 different formulations. That would take days to do with people tasting them."



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## Lift trucks, pallet trucks and stackers range

Hyster is introducing to Asia-Pacific its UT Series of diesel or dual-fuel counterbalance lift trucks, pallet trucks and stackers in six different capacities from 1.5 to 3.5 tonnes.

The range is suitable for many industries, including food and beverage, warehousing, manufacturing and logistics.

The uncomplicated approach to materials handling — backed by 24/7 service — is suitable for users whose materials handling equipment is required to work intermittently over a working week, on an as-required basis, typically up to 1000 h/year.

The ergonomically designed operator compartment with a familiar automotive layout means that drivers will be able to work comfortably, preventing tiredness during handling operations. A range of standard features and options helps to ensure that the truck is configured to the needs of the application.

Thanks to the simplicity of the components and specification, servicing can be carried out quickly and easily, even when PCs, laptops or diagnostic tools are not available.

**Hyster-Yale Asia-Pacific Pty Ltd**  
[www.hyster-yale.com](http://www.hyster-yale.com)





## Functional native starches texturisers

Ingredion has launched an addition to its range of clean label texturisers — the Novation Lumina functional native starches.

The starches are specifically designed for light-coloured applications with subtle flavours. The texturisers' neutral colour and flavour profile give manufacturers the ability to maintain appealing qualities of their products — even in the most delicate food applications.

The functional native starches deliver viscosity and gel strength comparable to modified starches. They provide good freeze/thaw and shelf-life stability, and have high process tolerance — making them suitable for products that undergo harsh processing conditions.

Of the countries that have provisions in place to regulate the term “natural”, Novation Lumina functional native starches meet the criteria of a natural food ingredient in the UK, France and Ireland, as well as associated EU legislation and the global ISO Technical Specification (ISO/TS 19657).

Labelled simply as corn starch, the functional native starches are also gluten-free, non-GMO and do not require allergen labelling. It is advised that manufacturers should carefully consult regulations specific to all target markets.

The product provides neutral flavour and colour, enabling formulators to develop creamy, smooth textures without impacting light colours or delicate flavours of finished products. The starches are suitable for a wide range of food applications, including yoghurts, dairy desserts and custards, dairy drinks such as drinkable yoghurts and flavoured milks, white sauces including cooking creams and ready meals, dressings, soups (ready-to-eat) and fruit preps.

### Ingredion

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



TESTING



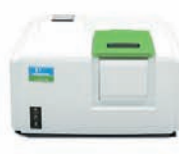
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## Clean label tapioca and rice flours

Ingredion has introduced a clean label range of Homecraft Create Tapioca and Rice Flours to Australia. The multifunctional flours go through a proprietary heat and moisture process to provide similar stability and shelf life to chemical modified starches.

Consumers are checking labels more than ever before and want to see ingredients that are expected and accepted. Ingredion research shows that Australian consumers find flour on a label more acceptable than starch.\*

According to Ingredion, the range is designed to provide consumers with a good eating experience as the products provide a clean flavour release and creamy mouthfeel.

Manufacturers can reduce salt and sugar levels with the clean flavours of the multifunctional flours. The creamy and velvety textures also allow for reduced fat content without compromising product quality and these textures are maintained throughout shelf life.

Yoghurt and dairy desserts can now be clean label with smooth and indulgent textures with no gelling or syneresis. Soup and sauces can have improved freeze-thaw performance and baby foods can have enhanced texture and stability over shelf life.

### Ingredion

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

\*Ingredion proprietary QBIC research 2017

## Organic bitter blocker

Australian and New Zealand manufacturers are increasingly faced with the challenges of reducing sugar within new product developments, often resulting in off and undesirable flavours being produced. Now there is a solution, ClearTaste, a natural bitter blocker derived from mushrooms.

ClearTaste is completely water soluble and acts as a true bitter blocker, blocking 11 of the 26 bitter receptors on the tongue. This gives formulators a great deal of freedom when faced with the current challenges of sugar reduction as it eliminates astringent and sour notes, along with metallic and other general off flavours in a myriad of applications. ClearTaste also aids in mouthfeel, which is an added benefit.

The product is made in the USA and has only been on the market for a short period of time. Successful applications include coffee, sweeteners, juices, proteins, milk-type products, health bars and soft drinks, to name a few.

Naturally extracted from mushrooms, ClearTaste bitter blocker has Organic, Kosher, Halal, Non-GM and FEMA GRAS certifications.

### Victus International

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



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## Pathogen detection

The 3M Molecular Detection System helps users save time and labour costs with its ready-to-use reagents, a single protocol for all pathogens and same- or next-day results. With its space-saving design and ability to test for multiple types of pathogens simultaneously, it helps users increase productivity and release products quickly, so they can protect consumers, their business and their bottom line.

The Molecular Detection Instrument is a small device featuring a compact footprint that fits in any lab, a solid design with no moving parts and automatic diagnostics at start-up. It has the capacity to test up to 96 samples per run for high throughput and can run all assays simultaneously for increased productivity.

The company's portfolio of products is consistently growing so when the market changes, it is there with the latest technology. Using isothermal DNA amplification and bioluminescence detection to overcome the limitations of older systems, the molecular detection assays can detect 1 CFU of target pathogen per sample even in the most challenging sample matrices. The assays now include: *Salmonella*, *Listeria*, *Listeria monocytogenes*, *E. coli* O157 (including H7), *Cronobacter* and *Campylobacter*.

When making important choices that could impact businesses, users need software that's intuitive and powerful. The 3M Molecular Detection Software gets users results when they need them — along with a user-friendly interface for quick set-up and real-time results for faster decisions.

### 3M Food Safety

[www.3m.com.au](http://www.3m.com.au)







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## ○ STAND B38

### Oil-free compressed air technology

The Aerzen oil-free and absorption-free compressed air technology is designed to ensure 100% product purity in all pneumatic conveying processes of sensitive bulk material.

The technology is ATEX-certified, which makes it suitable for solving demanding production requirements, eg, in the food and pharmaceutical industries or chemical and petrochemical processes.

It is important to consider any installed, oil-lubricated compressed air machines (bearing and gear wheel lubrication) which can come into contact with the bulk material in the pneumatic process in any form whatsoever. Not only can the contamination of the bulk good with oil pose a potential hazard, the damage to the installed compressed air system, up to total failure, may also cause considerable costs. According to Aerzen, there are no compromises with the absolutely oil-free and absorption-free compressed air technology.

The company's positive displacement blowers (Delta Blower), rotary-lobe compressors (Delta Hybrid) and screw compressors (Delta Screw) are used as compressed-air packages in the pneumatic processes of various industries, including the food industry. All the machines are certified.

**Aerzen**

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

## ○ STAND G16

### Purpose-built testing laboratories

With over 20 years' experience, Symbio Laboratories can perform efficient and advanced testing in its state-of-the-art, purpose-built laboratories.

Australian owned and operated, with nationwide facilities located in Brisbane, Melbourne, Sydney, Perth, Townsville, Hobart and Wagga Wagga, Symbio Laboratories provides testing to the food, agriculture, water and environmental industries.

The Symbio Laboratories team includes highly qualified professionals with direct industry experience, working closely with every client to provide customised and cost-effective laboratory solutions. Symbio Laboratories also provides a wide range of support: from metro sampling to courier services and customised IT reporting solutions.

Using innovative technology, all laboratories are NATA accredited and comply with both national and international testing guidelines.

**Symbio Laboratories**

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

## ○ STAND D37

### Hygienic positive-drive conveyor belting

BMA Belting Australia in conjunction with Volta Belting presents the next generation in hygienic positive-drive conveyor belting for the food industry — Volta's Metal Detectable (MD) series.

Food contact with conveyor belting has always raised concerns regarding plastic contaminants being deposited into the production of food due to mechanical failure or general wear and tear. Volta's MD series of materials has been innovated to eliminate any concerns and fears held by food processors and consumers regarding food safety. This innovation has been developed to meet the high demands of Australia's food processing sector in providing quality assurance towards strict food safety requirements.

The technology combined with Volta's patented sprocket driven Superdrive and DualDrive designs incorporates strict hygienic standards with minimal maintenance and running costs, making it a suitable option for all unpackaged food processing conveyors.

The integral teeth produced on the underside of the belt create a positive-driven, low-tension, 100% closed hygienic surfaced belt suitable for use in the food industry.

**Brendma (Aust) Pty Ltd**

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







## ○ STAND A42

### Stainless steel drainage products

Recently entering into a strategic partnership with ACO Australia, AusPress is working closely to develop various new products to expand the range of high-quality ACO stainless steel drainage products to suit the food and beverage processing market.

Beginning with the redevelopment of the ACO Gullies (Floor Drains) to standard one-piece designs and new round options plus epoxy edge infill standard, the ACO/AusPress drain bowls are WaterMark approved, HACCP certified and compatible with the fully welded HygieneFirst frameless ladder grates.

Founded in 1992 (as Blucher Australia Pty Ltd), AusPress has worked closely with key national facilities, specifiers and contractors to supply products with a focus on hygiene and performance for the food and beverage processing, abattoir, dairy, pharmaceutical, healthcare and water treatment industries.

**AusPress Systems**

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

## ○ STAND H24

### Food and beverage range

NORD DRIVESYSTEMS will be showcasing its targeted, high-quality food and beverage solutions at FoodTech Queensland. The company delivers individual drive solutions for the industry which offer energy savings, reduced maintenance and minimum downtime, and are designed to the stringent standards of the food and beverage sector.

One of the latest additions to its product portfolio is the NSD TupH, which has been tested in some of the harshest and most demanding environments. Its unique and resistant surface is designed to be a cost-effective and reliable alternative to stainless steel and has stood the test of time in manufacturing environments around the country. Its corrosion-resistant, cleanable, sealed surface delivers all the benefits without compromising on quality. Its surface is 6–7 times harder than the aluminium substrate and up to 1000 times harder than paint.

Another product to be featured on the stand will be the IE4 range of synchronous motors — built for high efficiencies and low operating costs. High efficiency levels of the IE4 range are based on permanent magnet technology, which NORD has specially designed. Even at low speeds, these units achieve high torques and good efficiency.

**NORD Drivesystems (Aust) Pty Ltd**

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

## ○ STAND A22

### Meat analyser

The DA 6200 meat analyser is designed to help improve profit, quality and consistency in all types of meat production. Users can analyse fat, moisture, protein and more — quickly, easily and accurately — or use it to verify incoming meats, in-process blends and finished products. The product's on-the-spot analysis capability is designed to help users run their plants more efficiently.

The system measures a wide range of raw meats, filling products and final meat products. The analyser is compact, lightweight and battery operated, which allows it to be easily moved between raw material intake and production sample points. It uses robust solid-state, diode-array NIR technology with no moving optical components, which helps ensure reliable operation, accurate measurements and optimal uptime.

Key features include: analysis of all types of meat samples; measures fat, moisture, protein and more in 30 s; easy operation by anyone in production facilities; cost-effective and low-maintenance; and compact and portable.

**Perten Instruments Australia Pty Ltd**

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



## ○ STAND C41

### Automated microbiology detection system

TECTA B4 is a self-contained 'lab in a box' solution capable of providing laboratory-grade results onsite with good time-to-result performance. Designed for industry and offering ease of use, samples can be run with three simple steps: add sample, load the cartridge, press start.

The system offers automated detection and quantitation of *E. coli*, total coliforms, faecal coliforms and *Enterococcus* with a dynamic range of 1 to 10<sup>8</sup> CFU in 100 mL without requirement for sample dilution in water matrices. This technology is suitable for a range of applications in food and beverage manufacturing, from incoming water, final product testing through to wastewater management.

The AOAC certified TECTA system is capable of providing positive results in 2 h and confirmed negative in 18 h for *E. coli* and total coliforms. The system uses an enzyme-substrate method combined with a patented polymer partition technology and optical detection system, which eliminates interferants such as turbidity, sample colour and high concentrations of bacteria. The instrument is network compatible and upon detection of a positive result or confirmed absent, the instrument can send automated notifications. Thermo Fisher Scientific is the exclusive distributor for TECTA-PDS in Australia and New Zealand.

**Thermo Fisher Scientific**

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



## ○ STAND G26

### Sustainable packaging solutions

Select Equip and its suppliers have been focusing on sustainability for the last few years, introducing flexible, innovative packaging systems that have been developed by engineers to reduce scrap waste, weigh accurately and package efficiently.

G. Mondini 40% film savings: G. Mondini S.p.A. has developed PLATFORM Technology with good performance delivering multiple packaging solutions on the TRAVE tray-sealing range.

Marco 30% uplift in productivity: Highly accurate systems that virtually eradicate product over pack, reduce waste and improve productivity, while allowing users to measure, control and improve the packing process.

Keymac cuts costs and improves efficiencies: Robust, compact, energy-saving machines with a small footprint provide manufacturers with the next step in efficiency and productivity.

Bilwinco reduces giveaway by up to 30%: Bilwinco develops and supplies custom-made wet or dry, multihead weighers and weighing solutions for cost-effective, reliable weighing and packing from basic machinery to complete, integrated packaging solutions.

Lafer trayless packaging for fresh produce: Lafer Packaging's flow wrappers can reduce labour costs and time. With the capability of wrapping without the need for plastic or cardboard trays, Lafer offers further waste and cost reduction possibilities.

**Select Equip**

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

## ○ STAND C8

### High-speed strapping machines

Highgate Group launches a range of high-speed strapping machines in Australia. The Stallion SS65 Advanced Auto Strapping Machine and SS70 High-Speed Auto Strapping Machine are designed to be robust, reliable and easy to operate.

The innovative design features include automatic loop ejection, automatic second strap refeed, automatic strap threading and external electronic tension control. These features result in high-speed, reliable strapping performance, irrespective of the quality of the strapping being used in the machine, while ensuring hassle-free machine operation and increased user safety.

Other features include a simple machine head with no clutch, no belt and no drive chain, eliminating the need for frequent maintenance, adjustments and replacements of drive chains and belts. The machines are also fitted with a simple jog switch to assist with quick and easy service and maintenance.

The SS65 Advanced Strapping Machine straps up to 37 straps/min and the SS70 High-Speed Strapping Machine is suitable for high-volume applications, delivering 58 straps/min.

The range also features the sensor-controlled heater plate, which applies an accurate amount of heat and pressure to connect and seal the ends of the strap. In the event of no carton being detected, the strap tension is automatically reduced to avoid operator injury.

The table height of the strapping machines can be easily adjusted for comfort and the ergonomic foot-bar operating switch on the SS70 machine allows the operator to load and unload cartons using two hands.

**Highgate Group**

[www.highgategroup.net.au](http://www.highgategroup.net.au)





## ○ STAND H33

### Wine pumping range

Ragazzini has selected Hydro Innovations to distribute its wine industry pumping range in Australia.

The Ragazzini Rotho peristaltic pumps have a gentle pumping action, with only the smooth and soft internal tube element in contact with the fluid. There is no contact with moving mechanical parts, no seals or valves. The Rotho peristaltic pumps do not damage the grapes, skins or seeds during the pumping process, which makes them suitable for other delicate food handling applications.

Features include: the use of food-grade hoses (which is the only component of the pump to come in contact with the pumped fluid); the capacity to pump solid particles; the (optional) retractable roller system which allows for fast CIP or SIP processes, and also enables users to remove the pressure from the hose during non-pumping periods, lengthening hose life; the standard early leak detection system can stop the pump and send an alarm, decreasing losses and downtime.

Rotho pumps can be used for dosing or metering small volumes [0.2 L/h] up to 180 m<sup>3</sup>/h, with pressures to 15 bar available.

#### Hydro Innovations

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



## ○ STAND H22

### Filter bag with dehydrated media

instaBAG is a filter bag which includes a dehydrated pre-dosed media allowing users to skip time-consuming media preparation.

It allows users to simply add their sample into the bag, add sterile deionised water and homogenise. The specially prepared media sachet will dissolve during the sample homogenisation process, so no extra steps are required.

The bags contain a filter which assists in keeping out sample debris during pipetting.

When compared to pre-prepared media, instaBAG will save storage space, save transport costs, produce less waste and is easier to use, according to the company. Furthermore, it has a long shelf life and does not require refrigeration.

instaBAG is currently available in BPW in 90 and 225 mL sizes.

#### Australasian Medical & Scientific Ltd

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

# National

  
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Since 1996 National Weighing and Instruments have been specializing in precision weighing and process instrumentation equipment covering analytical and industrial applications.

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## ○ STAND G20

### Spiral oven

JBT has launched the Stein TwinDrum 600 spiral oven, a compact and versatile two-zone cooking system for a wide range of applications. The oven can cook, roast and steam-cook a wide range of applications, while maintaining low cost of ownership.

Available in two different heights (standard and tall stack), the unit can be made to suit a variety of throughput ranges for small-, medium- and large-volume producers.

Independent moisture and temperature controls in the two zones mean that the cooking process can be tailored to suit exact requirements.

As with all JBT products, the Stein TwinDrum 600 Spiral Oven is low maintenance and its automatic cleaning and recirculation system is claimed to make it easier and less costly to clean.

**JBT (John Bean Technologies Australia Ltd)**

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

## ○ STAND E49

### Rotational viscosity

The ViscoQC 300 viscometer is designed to ensure the quality of a substance from almost any fluid to semi-solid samples — from oils up to semi-solid samples such as jam — by delivering fully traceable viscosity results and quality control.

Starting with a multipoint viscosity measurement for a beverage/food sample, the ViscoQC 300 is upgradeable with additional analysis software (V-Curve) to meet user requirements.

Features include: automatic spindle/guard detection and digital instrument alignment check; simple one-handed spindle attachment/exchange by built-in magnetic coupling; the V-Curve adds graph/analysis/programmability features to the standalone instrument; data processing is improved via LIMS Bridge and/or the optional sample barcode scanner; and spindle lifetime is improved thanks to food-grade stainless steel AISI 316L.

**Anton Paar Australia Pty Ltd**

[www.anton-paar.com/au-en/](http://www.anton-paar.com/au-en/)

## ○ STAND H8

### Hygiene monitoring system

The EnSURE Touch is a next-generation hygiene monitoring system that collects, analyses and reports data from multiple quality tests such as ATP, microorganisms and enzymes, providing necessary data for audit and risk management.

EnSURE Touch's library of tests include: AOAC approved ATP swab – UltraSnap; 7 h bacteria counts from surfaces and product; alkaline phosphatase testing for milk pasteurisation; and acid phosphatase for raw meat residues from surfaces and product.

The unit features an intuitive smartphone 5" shatter-proof touch screen that works while wearing gloves. Test points, test plans and users can be customised to a facility, including randomisation of testing and minimum testing quotas.

Wi-Fi connectivity allows fast syncing of results to the cloud-based SureTrend trend analysis software. This enables users to monitor, track and trend testing results across one or multiple facilities, schedule automatic reports and easily configure one or hundreds of monitoring systems from a single SureTrend account.

The built-in screen sharing technology allows remote training and troubleshooting of the units in real time that minimises disruption to the user's plant.

**Key Diagnostics Pty Ltd**

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







## ○ STAND F43

### Process water treatment for the food and beverage industry

Waterform Technologies has a range of process water treatment technologies that are suitable for the Australian food and beverage industry.

WaterBank water digitisation software is a dashboard that shows critical site-wide water information including treatment outcomes, costs, recoveries, losses and more.

Barrier UF Inge Multibore for ultrafiltration plants provides one of the toughest membranes in the water industries (10 bar burst pressure). Certified virus, bacteria and protozoa rejection of 99.99999% at 0.02 micron filtration, the product is suitable for process critical and potable water lines.

ultraReuse for wastewater reuse plants provides potable standard water from any type of wastewater, reducing reliance on mains water.

High-recovery desalination technologies provide alternative sources of potable and irrigation water.

**Waterform Technologies Pty Ltd**  
[www.waterform.com.au](http://www.waterform.com.au)

## ○ STAND C7

### International-size customs-ready plastic pallets

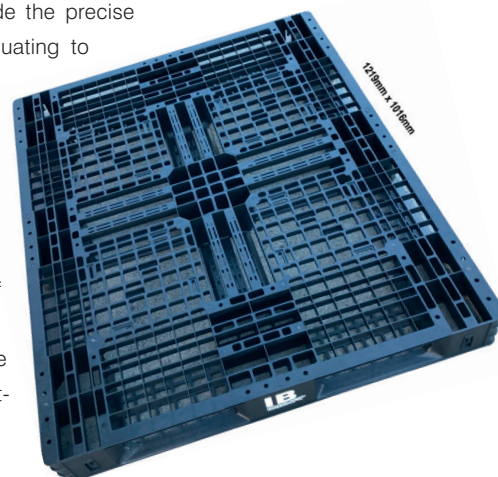
IB Pallets has a range of international-size, food safe, hygienic plastic pallets for high global efficiencies. Sizes range from 500 x 600 mm plastic skids up to oversized plastic pallets and include the precise sizes many require for specific countries, and/or carriers. USA uses imperial sizing equating to 1219 x 1016 mm, South Africa 1200 x 1000 mm and Europe mostly still prefers 800 x 1200 mm. All these sizes and others can yield operational savings through avoiding unnecessary pallet transfers, for users and their customers.

Global movement in containers rely on size efficiencies to optimise space. Size matters when loading standard containers and 'reefers' for food.

Because of the reliable plastic quality in the pallets, regulated X-ray and metal detection will not be set off by the pallets. And environmentally, when the pallets reach their end of life, they can be upcycled into high-quality products.

Many have found that by considering pallet size in their operational strategies they have not only reduced risk across several benchmarks, but increased efficiencies (and their bottom line) by coordinating sizing improvements.

**IB Pallets**  
[www.ibpallets.com](http://www.ibpallets.com)



## ○ STAND H32

### Pre-made pouch packaging machine

The ADM-DP30 is designed to pack pre-made pouches and the ADM-DP31 to pack pre-made coffee gusset bags. Built in Australia to international standards using the latest automation technology, the machines are suitable for the food industry.

The DP3 series is supplied in stainless steel and aluminium anodised parts, and features speeds up to 24 ppm, single operator, intelligent screen control, quick five-minute bag size change, guarding and interlocks to AS4024 standards.

ADM-DP31 has interchange options including that of the ADM-DP30 which enables one machine for all packaging styles. The ADM-DP3 series is configurable for various pouch styles, including pillow bag, gusseted bag, quadseal, doy pouch, coffee bags 250 g, 500 g, 1 kg, etc with or without the reclosable zip insert.

The machine is suitable for a range of products, eg, coffee beans, ground coffee, dairy powder, protein powder, hot fill liquids, spices, flour, oats, cereal, pasta, mixed lollies, beef jerky, pet foods, cookies, fine chocolates, hot chocolate powder, gourmet nuts, auto parts and many more.

**ADM Packaging Technology Pty Ltd**  
[www.admpt.com.au](http://www.admpt.com.au)



## ○ STAND D16

### Robotic application

The SMC EX600 wireless manifold (EX600-W) is a decentralised solution that is EtherNet/IP and PROFINET compatible, can withstand electric noise and is suitable for harsh, industrial environments.

Lightweight and compact, the solution provides operational flexibility as it can be positioned nearly anywhere, which makes it suitable for users working with moving parts, such as rotary and indexing tables and robotic arms.

As a wireless unit, the number of cables and connectors are also cut to minimise installation, modifications and maintenance time. The risk of disconnection and circuit breakage is also significantly reduced to improve both performance and productivity.

**SMC Australia | New Zealand**

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



## ○ STAND B6

### Wastewater treatment at Norco Foods achieving good results

Australian farmer-owned dairy cooperative Norco Foods continues to receive good results from Gold Coast City Council's (GCCC) testing at its Aerofloat wastewater treatment plant. Recent testing at the site shows that the Aerofloat design is continuing to reduce the chemical oxygen demand (COD), total suspended solid (TSS), and oil and grease (O&G) levels in the wastewater well below the GCC discharge standards.

Aerofloat's design at Norco consists of two AeroDAF 400s as the first stage to remove most of the milk fat and protein (by removing the majority of the TSS and O&G). This is followed by a biological stage — the Moving Bed Biofilm Reactor (MBBR) — for approximately 50% of the flow, to further reduce the COD (soluble protein and lactose).

The final stage in the AeroDAF 200 removes any remaining biological solids from the MBBR. Aerofloat's Managing Director, Ray Anderson, said, "We are producing excellent primary effluent from the two AeroDAF 400s. This has created a stable environment for the fixed film biological culture in the MBBR." GCCC discharge limits are 1500 mg/L for COD, 600 mg/L for TSS and 200 mg/L for the

O&G. The Aerofloat design at Norco is consistently achieving an effluent quality less than 900 mg/L of COD, 200 mg/L of TSS and 25 mg/L of O&G, meeting regulations.

**Aerofloat (Australia) Pty Ltd**

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



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# NEW DIGITAL PRINT AND CUT SYSTEMS FROM LABEL POWER



OKIPRO1050

Professional four colour and five colour label printing is now possible on a wide range of uncoated label and tag media with the new OKIPRO range of colour label printers

## OKIPRO1040 and OKIPRO1050

Colour Options:	4 Colour CMYK (OKIPRO1040) 5 Colour CMYK plus White (OKIPRO1050)
Media Handling:	Plain Paper Label, Glossy Paper Label, Synthetic Film Label
Label Length:	12.7mm (0.5") - 1320.8mm (52")
Roll Wind Direction :	Face-out, Face-in
Print Speed:	Max. 152.4mm/s (6ips)
Auto Cutter:	Rotary blade full cut

# VIRGO DESKTOP DIGITAL LABEL FINISHING SYSTEM



VIRGO



## LABEL FACE IN OR FACE OUT

Thanks to an easy button equipped on Virgo, you can choose how obtain the finished rolls of label.



This button allows the user to control the direction of the rotation on rewriter core holder giving, you the user, the ability to choose whether to have the finished label rolls facing in or facing out.

This added benefit makes the Virgo a complete machine for all of your business needs.

Virgo is a compact desktop finishing system that unwinds, laminates labels for durability, digitally die cuts, removes excess label material around each die-cut shape, slit, and rewinds offering you everything to professionally cut and finish labels. The system provides a very accurate label finishing solution using cutting plotter technology with reduced dimensions. This allows you to cut different types of materials and shapes on the fly without the added cost of dies.



## FreddyPro™

### Advantages of FreddyPro:

- Easy to operate
- Low capital cost
- Casing cost savings vs traditional
- Accurate portion control
- Reduced casing waste
- Reduced rework
- Reduced labour
- Increased food safety
- More uniform product appearance
- Environmentally friendly casing
- High hygiene and sanitary standards
- Halal
- Kosher
- Vegetarian
- Vegan
- Smaller footprint
- Easy cleaning

### Specifications:

Belt Speed: 0.4 m/s

Possible Calibre Ranges: 8 - 32 mm

Possible Product Output: 79 - 1,262 kg/hr

Machine Dimensions: 1,530 x 798 x 1,268 mm (LxWxH)

### Fresh sausages

Co-extrusion alginate sausage casings for fresh application is well known within the European and American market and is widely acceptable. Less product smearing is often the result of using alginate casings, improving the product's overall appearance.

### Vegetarian and vegan sausages

Alginate casings are not limited to meat-based filling and can be applied to plant-based filling as well. This opens the door to the vegetarian/vegan and flexitarian market with ease.

### How Is Alginate Gel Better Than Cellulose Casings?

- Shorter production time
- No peeling required
- Almost no waste
- Quality and consistency
- Savings throughout the process
- Greater efficiency all round

