

May/June 2017  
Vol.25 No.1

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

## 25-year anniversary issue



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# Celebrations and congratulations all round



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Everyone is having a significant birthday it seems.

The Australian Institute of Food Science & Technology is celebrating its 50th birthday this year, as is foodpro. Not to be left out of the celebrations, this issue of *What's New in Food Technology & Manufacturing* marks 25 years since the magazine was first published.

To have an industry association, a major food event and this publication all strong and vibrant after many decades is a testament to the food and beverage industry in Australia and New Zealand. The industry must be doing things right or the wheels would have long fallen off.

When I started to write this piece I decided to have a look at the first issue of *What's New in Food Technology & Manufacturing* and was pleased to see many of the companies telling the readers about their new products in our first issue in 1993 are still in business and thriving: Heat and Control, SMC Pneumatics, Spirax Sarco, ProMinent Fluid Controls, Arrow Scientific, Dynavac, Siemens, DFC Packaging, Yokogawa, IBM, Pumpability, ABB, Anchor Packaging, Austral Engineering, Particle & Surface Sciences, Beckman, Shimadzu, bioMerieux, ATA Scientific, Cryovac and Warsash. How special to have so many of these companies in this issue as well!

The concerns facing the food industry 25 years ago weren't very different to what we are facing today. The need for hygiene, sanitation, traceability and reliable sensors and monitoring systems to ensure product quality are still prime concerns today just as they were back then. However, 25 years ago waste minimisation and sustainability matters were just rearing their heads. Trade waste standards were coming in 1994 so everyone was aiming to clean up their waste streams. The other notable changes are the movement from lab testing to online, real-time monitoring, Wi-Fi communication systems obviating the need for extensive cabling and the ease with which data can now be collected and manipulated.

Come September I will have been editing this magazine for 20 years (luckily I am only about two years older than I was way back then!). I thoroughly enjoy the Australian food and beverage industry and my contact with the magazine (and now website) readers and advertisers. Across the board the people in this industry are just plain nice — thank you.

When you visit foodpro and attend the AIFST's conference in July, come and visit our stand on Level 1 — this time we are giving away dancing cow stress balls (go figure).

So here's to all of us — may we all enjoy the next 25 years just as much.

Janette Woodhouse  
Editor  
jwoodhouse@wfmedia.com.au  
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# Food FOR thought

## Billions saved and longer lives: the case for sugar, salt and fat taxes

Reigniting the debate over 'junk food' taxes, University of Melbourne modelling has shown that Australia could save \$3.4 billion in healthcare costs by introducing a package of taxes on sugar, salt, saturated fat and sugary drinks, while subsidising fruits and vegetables.

Such a package would result in an additional 2.1 years of healthy life for every 100 Australians alive in 2010, according the research, which has been published in *PLOS Medicine*.

A tax on sugar in foods like confectionery and ice-cream would result in 1.2 additional years of healthy life per 100 alive people in 2010, researchers from the Centre for Public Health Policy found.

Lead researcher Dr Linda Cobiac said taxes on salt, saturated fat and sugary drinks contributed the remaining health gain. "Few other public health interventions could deliver such health gains on average across the whole population," Dr Cobiac said.



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## Gates celebrates 30 years in Australia

Customers, staff, industry partners and supporters gathered recently to mark Gates Australia's 30-year anniversary.

The night was a chance to look back on some of the significant moments that have decorated Gates' three decades in the country, and relive memories of years gone by. Throughout the night, a video played on screens behind guests, featuring images of past events, Gates products and facilities, and customer testimonials.

Gates Australia Managing Director Carl McGowan said on the night, "30 years in business for any type of company is an excellent effort. It is pleasing to say that a number of distribution partners have been with us for the whole journey; some even used the Gates product before we officially entered the Australian market in our own right!"

The theme of 'quality' ran throughout the night, with many distributors and partners highlighting the quality of Gates parts as a reason to continue using their belts, hoses and other products.

"We'd really like to thank all of those who attended, those who couldn't make it and everyone who has been a part of the Gates Australia story so far," said Gates Australia Marketing Manager Priscilla Robb.

"Without your support, we wouldn't be where we are today. We're looking forward to another three decades of business in Australia!"

## ABB is getting into 3D inspection

NUB3D is a Spanish start-up company that supplies 3D white-light scanning sensor technologies. The company uses digital scans to optimise inspection and quality assurance in manufacturing as its sensors can detect defects on manufactured items with high accuracy.

ABB has just acquired NUB3D so it can expand its portfolio of ABB Ability solutions that connect users to the Industrial Internet of Things.





## Understanding the link between disease and the microbiome

There is a growing body of evidence indicating that the trillions of microbes that live on and inside our bodies — our ‘microbiome’ — affect our health. Recent research has found that changes in the composition of bacterial communities in the intestines lead to imbalances in metabolic processes the microbiome collectively perform, and that such imbalances are associated with obesity, type 2 diabetes, cancer, autoimmune diseases and certain neurological disorders.

These findings suggest that it might be possible to prevent or treat these conditions with diet, drugs or some other intervention that restores the microbiome’s functional capacity. To do this, though, it is first necessary to determine which bacteria — from the hundreds to thousands of bacterial species that populate different microbiomes in a human body — are responsible for which functional imbalances.

In a paper appearing in the journal *Cell Host & Microbe*, researchers from the University of Washington School of Medicine report on a new method that reveals how much individual bacterial species contribute to disease-associated functional imbalances in the microbiome.

“This method opens the way to pinpoint which species in our microbiome are responsible for each functional imbalance, so they can be targeted for therapy,” said Elhanan Borenstein, the paper’s senior author and an associate professor of genome sciences.

The ‘Functional Shifts’ Taxonomic Contributors’ method, given the snappy nickname ‘FishTaco’, integrates two common ways scientists look for associations between microbiomes and disease: a taxonomic approach and a functional approach.

Image courtesy of gerald/via Pexels) under CC0 Public Domain



Two variants of the mobile cleaning device: self-driven or on a conveyor belt.

## Cleaning adapted to the hygienic state of the machine

Fraunhofer IVV Dresden has developed a mobile device that facilitates the cleaning of processing machinery. The mobile cleaning device (MCD) brings together the benefits of traditional automated cleaning systems and the versatility of manual cleaning. It has an optical sensor system for dirt detection and adaptive cleaning.

What areas are dirty and need cleaning? When is the cleaning finished? Was it successful? In the future, these questions will be able to be answered using inline sensor systems.

The virtual twin of the MCD comprises an adaptive model of the cleaning process. Combining this with cognitive control concepts and the sensor system for dirt detection allows for adaptive cleaning — cleaning adapted to the hygienic state of the machinery.

The flexibility of the system is evident in the drive concept. Movement between machine modules can take place via a drive unit or by using existing transport systems such as conveyor belts. In contrast to standard cleaning systems, the MCD is not installed in a dedicated way in a machine; rather, it can be used in a versatile way to clean several machines. Separately driven nozzles are available for foam and spray cleaning. Besides the cleaning of whole machines, the targeted cleaning of parts of a machine is also possible.

## AIP welcomes new national board

The Australian Institute of Packaging (AIP) has welcomed a new national president and new board at its annual general meeting, held alongside AUSPACK 2017.

Dr Carol Lawrence, PhD, FAIP has been elected to be the National President of the Institute for the next two years. Carol’s experience in the packaging industry spans over 20 years, starting with a technical role that underpinned the selection of the most appropriate label material to complement the packaging. This role was enhanced by a background in chemistry, including a PhD in polymer chemistry, gained in the UK. She has expertise in assessing the environmental impacts of self-adhesive label stocks and how to select sustainable raw materials and ensuring that mechanisms are in place for third-party verification of their environment. Carol was also the Victorian Chairperson for the AIP for the last two years.

The AIP National Board members include two new members in Anthony Peyton MAIP as the new Victorian Chair and Jason Fields FAIP to the Northern Region committee. Board members continuing on for another term include Joanne Cockerill MAIP, CPP as Central Region Chair, Brent Du Preez MAIP as Central Region Associate, Pierre Pienaar FAIP, CPP as Education Director and Northern Region Chair, George Ganzenmuller FAIP as Northern Region Associate, Greg Roberts FAIP, CPP as Southern Region Associate, Craig Wellman FAIP as Treasurer, Ralph Moyle FAIP as Education Coordinator and Nerida Kelton MAIP as National Executive Officer.



## Food Agility CRC to drive the digital transformation of Australia's food industry

Minister for Industry, Innovation and Science Senator the Hon Arthur Sinodinos AO has announced funding for the Food Agility CRC.

Following a successful bid by a consortium led by the Knowledge Economy Institute at the University of Technology Sydney (UTS), together with QUT and Curtin University, the Food Agility CRC will be funded with \$50m over 10 years through the federal government's Cooperative Research Centres program.

"UTS is proud to be working together with the Australian Technology Network of universities and our colleague regional universities on the Food Agility CRC," UTS Vice-Chancellor and President Professor Attila Brungs said.

"Australia has one of the most advanced agricultural industries in the world. We look forward to working hand in glove with the food and agricultural sector to advance the sector, and demonstrate how innovation is crucial to providing opportunities and prosperity for all segments of Australian society," Professor Brungs said.

The Food Agility bid raised over \$160 m in commitments for the proposal and has 54 partners across the food value chain — including 15 technology providers, 11 food production companies, 7 service providers, 7 research providers, 6 regional development agencies, 5 government agencies and 3 industry networks.

Projects currently underway include:

### In horticulture:

Food Agility consortium partners are using the Internet of Things to improve the shelf life of bagged lettuce, which is dramatically affected by its water content when harvested. Combining on-farm data with data from processing and retailers optimises those harvesting decisions. Just one day of shelf life dramatically improves yields and reduces food wastage, worth billions to the food industry.

### In food export markets:

The CRC is working with the food and agribusiness growth centre Food Innovation Australia Ltd (FIAL) to develop a Market Insights & Information portal which will use real-time information from a number of sources to produce qualitative and quantitative insights to support businesses interested in entering new markets, both domestically and overseas.

### In finance:

Food Agility is working to provide viticulturists with better and more timely information so they can benchmark themselves and identify opportunities to improve farming practices, reduce costs and improve the quality and yield of their produce.



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## Nestlé invests in gluten-free New Zealand

Recognising the continuing demand for gluten-free products in Australia and New Zealand, Nestlé has just opened a new, dedicated gluten-free facility in Cambria Park, South Auckland.

The factory will produce gluten-free products in the Maggi range as well as Nestlé Docello — dessert mixtures used in professional food service.

It is anticipated that the site will generate \$60 million in exports annually.

The controlled production opening plant was officiated by NZ Prime Minister Bill English.

"Our international research and development program now allow us to create high-quality gluten-free products that taste great and maintain texture. Gluten-free no longer means compromise," said Veronique Cremades, Nestlé New Zealand CEO.



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## The Drinks Industry Show returns to Sydney

The Drinks Industry Show will showcase the best in wine, beer, spirits and service providers from across the globe and reconnect producers and distributors of alcoholic beverages with senior-level decision-makers from the trade.

- What: The Drinks Industry Show
- Where: Luna Park, Sydney
- When: 26/27 June 2017
- Theme: Innovation
- Registration: [www.drinksindustryshow.com.au](http://www.drinksindustryshow.com.au)

Attendees can look forward to two days of networking, masterclasses, taste testings, mixology demonstrations and a free seminar program.

The event has joined forces with Fiona McDonald, director of the Wine Chronicles, who will create a program with industry leaders addressing the key trends and challenges facing the drinks industry today. As part of the program Giuseppe Minissale, president of the Australian Liquor Stores Association, and John Hart, CEO of the Restaurant and Catering Industry Association, will discuss the state of the Australian beverage industry and as a buyer and seller, what this means for you.

After an extended research phase, seminar sessions will be specifically designed to tackle real live issues facing both on- and off-premise buyers today with the goal of empowering attendees to shape and improve their businesses.

An eclectic mix of suppliers from Spain, China, New Zealand and Australia have already confirmed their place at what is set to be the 'must attend' event of 2017 for the drinks trade.

Whether you are looking to source new product, keep up to date with the latest trends or network away with the great and the good of the industry, The Drinks Industry Show is the place to be.



## Champion mixologist Ben Davidson joins The Drinks Industry Show

The Drinks Industry Show has appointed industry expert and ambassador Ben Davidson as event curator.

Davidson will share his extensive knowledge of the drinks industry, as well as being responsible for driving senior-level buyers to the show and raising awareness and exposure of the event, which will be held 26–27 June 2017 at Luna Park in Sydney.

Davidson is a former Cocktail World Cup Champion (2004) and Australian Bartender of the Year (2003, 2005) with nearly 20 years' experience behind the bar. Until recently he had been the spirits education manager, national spirits ambassador and head of mixology for Pernod Ricard Australia for 10 years. During this time he received Ambassador of the Year awards as well gaining a WSET Trainer credential and in 2016 was inducted as a Keeper of the Quaich.

"I'm excited to be a part of the Drinks Industry Show in the capacity of event curator, helping to attract a diverse range of large and small brands across all categories, to exhibit their products to the Drinks Industry professionals of Sydney and beyond," said Davidson.

## JBT acquires Avure Technologies

High-pressure processing systems manufacturer Avure Technologies has been acquired by JBT and will become part of the JBT FoodTech business.

The synergy between Avure's design, fabrication, food science and installation of high-pressure processing systems for the food and beverage markets and JBT's existing portfolio of protein and liquid foods technologies should be a win-win-win for JBT, Avure and food processors involved in the protein and liquid foods markets.



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# Smart manufacturing in the food and beverage industry

Glenn Johnson

**Most of the smart factory discussion has centred around discrete manufacturing, but modern smart sensing technologies can also be applied to improve many aspects of the food and beverage industry, particularly for food safety and track and trace, improved packaging and new product opportunities.**

**T**he concepts of Industry 4.0, IIoT and 'smart manufacturing' have been gaining much press in recent times, particularly in relation to discrete manufacturing. Those working in an industry such as food and beverage — overwhelmingly driven by batch manufacturing processes — may find it difficult to see how such technologies could assist and improve their business. There are, however, definite areas in which these modern technologies can help modern food manufacturers improve efficiencies, market share and food safety.

## Food recalls and traceability

A food or beverage product may be recalled for a number of reasons: complaints from consumers or customers, or by order of retailers or government. It might also be recalled as a result of testing and auditing at a food business or in the upstream supply chain (raw ingredients). Food Standards Australia New Zealand (FSANZ)<sup>1</sup> classifies the types of problems that can occur as including:

- **Microbial contamination:** Pathogenic microorganisms such as bacteria, viruses or parasites.
- **Labelling errors:** Non-compliant labelling, incorrect food ingredients on the ingredient list, incorrect date markings or other food labelling errors.
- **Foreign matter:** Contamination with material such as glass, metal or plastic objects. >>



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- **Chemical or other contaminants:** Contamination with substances such as cleaning products, pesticides, machine oil, etc.
- **Undeclared allergens:** Due to incorrect labelling, incorrect packaging or contamination of the product by an allergen.
- **Biotoxins:** Contamination with biological toxins such as histamine in fish and paralytic shellfish toxin in oysters.
- **Other faults:** Those not covered above, such as packaging faults or unsafe levels of additives.

In recent times there has been mounting pressure on food and beverage manufacturers to initiate and achieve product recalls in ever decreasing time frames, making effective product track-and-trace imperative.

Complete food traceability involves the tracking of a product's history and sharing that data along the entire processing path — so-called 'farm-to-fork' or 'paddock-to-plate' programs. When it comes to food, knowing the exact source of where a raw ingredient came from is important should a recall be necessary. Studies have shown that the number of incidents of illness due to foodborne pathogens have been increasing with an increased consumption of fresh produce. The problem is that once an illness occurs in the community, it is often a complex and lengthy process to find the source of contamination. Traceability back to the source is therefore critical to shorten the time taken to find the source.

Modern smart sensing technology has a role to play in streamlining the entire farm-to-fork supply chain that makes identification and traceability as efficient and reliable as possible.

Technologies such as RFID are now making possible the tracing of raw ingredients from the original source. A good example is Japanese tomato processor Kagome, whose Australian factory in Echuca cultivates and processes tomatoes for food companies in Australia and overseas. Today, cultivating and processing tomatoes is automated, and it can be a logistical challenge to get the tomatoes from the field to the factory in the most efficient way.

Kagome operates 12 harvesters loading tomatoes into more than 300 bins, each with a capacity of 14 tonnes. Once a bin is full with fresh tomatoes, it is picked up by a truck

and taken to a weighbridge close to the factory. As part of Kagome's quality control process, three samples from each bin have to be processed in the laboratory to ensure the quantity and quality of the yield. RFID tags are attached to the tomato bins, accompanying them right from the start of the harvesting process, and allowing real-time identification of where the tomatoes in each batch come from. With reliable real-time data made available by intelligent identification technology, Kagome has the ability to make better decisions, increasing productivity and efficiency, and making their products traceable to the source.

### Consumer habits are changing

How consumers shop is changing, and many consumers today are turning to their smartphones for on-the-spot product research. A research report in 2014 from Deloitte Consulting<sup>2</sup> found that 84% of retail store visitors in the US use their smartphones before or during the visit to the store for product information and those that do convert to buyers at a 40% higher rate.

Retailers and manufacturers are therefore having to come up with new ways to engage the consumer at the point of sale so they can influence the purchase decision. That means packaging, shelf labelling and point-of-sale displays that can communicate with consumers through their smartphones. Some companies are also turning to technology to protect against product tampering, counterfeiting and theft. Some companies have an interest in extending the shelf life of fresh produce and reducing food and packaging waste.

A key enabling technology for all these applications is printable electronics (PE) — inks which can conduct electricity, made from materials such as graphite, silver and copper — that can be printed on a substrate thin enough to have negligible impact on package size. The substrate can be rigid, flexible or even stretchable, such as paper, plastic, fabric or glass.

PE can be used to create discreet components such as displays, conductors, transistors, sensors, light-emitting diodes, photovoltaic energy capture cells, memory, logic processing, system clocks, antennas, batteries and low-voltage electronic interconnects. >>



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*Smart labelling and packaging is only as good as the available information.*



An example of a company utilising such technology is Canadian company NFC Authority, which is providing printed near-field communication technology<sup>3</sup>. Pilot trials began in June 2016 with three target customer groups — wine, craft brewers and craft distilleries. NFC Authority's solution combines a wireless tag with a printed antenna design and software application with a cloud-based platform. Consumers don't have to install an app — they just need an NFC-enabled device. They tap the bottle to confirm its authenticity. That same tap reveals more information on the product and offers digital engagement opportunities like video, loyalty, ratings, reviews, etc. With each tap, the brand owner can collect and analyse data such as user demographics, location, likes, social shares and number of taps through NFC's cloud-based analytics tool.

NFC Authority's printed electronic tags come on industry-standard rolls for adhesive lines that are already equipped to place tags. The tags are already pre-encoded with the hardware to scan and register them.

Smart labelling and packaging is only as good as the available information. While collecting customer information is useful, providing up-to-date information to customers depends on that information being available from the manufacturer. Today's smart sensor technologies in the food and beverage plant are at the core of enabling up-to-date product information to be presented directly to the consumer, including raw material provenance, sustainability data and allergen information.

### Is 'batch size 1' feasible for food and beverage?

Perhaps the Holy Grail of Industry 4.0 is the concept of a single-unit batch. Smart sensor technology coupled with adaptive automation systems will be key to achieving this goal, in which manufacturing plants are flexible enough to adapt to individual customer requirements. This might not at first seem particularly feasible for batch-oriented manufacturers such as those in the food and beverage industry.

Some food companies have tried to achieve this and failed — one notable exception being German breakfast cereal manufacturer mymuesli GmbH<sup>4</sup>, which allows customers to build their own muesli recipe that is then packaged with their own customised labelling and shipped to them direct. Of course, simple mixing of dry ingredients makes such a customisable food product feasible, where other types of food or beverage may not be so easy to manufacture in a single-unit batch.

One area that may be more promising is customisable packaging. An example of a step in this direction in packaging is that it will be possible to pack items of differing sizes (such as different sized beverage bottles) on one system using smart sensor detection with automatic format adjustment. The system continues running automatically and does not require line shutdowns to change batches.




### The data is the important thing

Depending on how the data is to be used, the data may be stored and used locally, or stored and processed by a cloud service. In the case of cloud applications, local consolidation of data at the source can improve data efficiency.

Smart sensors that incorporate their own smart logic can reduce the data demand by providing only necessary information as desired. In the bottle-packaging example, the smart sensors also assist in automatically reconfiguring the process, keeping the running production data within the packaging line for best efficiency. Only final production data should need to be forwarded on for batch track and trace.

Reliable and unambiguous identification of goods in the production process and supply chain is a vital prerequisite for efficiency and full traceability. Whether it's a single product on a conveyor or data about thousands of bottles of beer that are transported every day, the status of all recorded data must be easy to retrieve and analyse. This is where the cloud comes into play, allowing data to be collected from multiple locations, analysed, and further read and shared from still other locations.

While the concept of 'smart manufacturing' may not intuitively seem to apply to the food and beverage industry, the opportunities for improving food safety and quality, as well as improving customer engagement, mean that smart sensing and smart manufacturing technologies should be high on the agenda of any forward-looking food or beverage manufacturer. 

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## Breakthrough in treating high BOD wastewaters

**As environmental laws around the world enforce stricter compliance and higher fees for wastewater discharge, many food and beverage producers need effective, low-cost ways to treat and reduce BOD loads on-site.**

For any food processing company, biochemical oxygen demand (BOD) can represent a costly challenge when managing its liquid trade waste. High BOD can be expensive to discharge and cause rapid erosion of infrastructure such as sewers and pipes.

### Maximising microbiology

Microorganisms are Nature's best recyclers and decomposers and used in most wastewater treatment systems.

Executive Chairman at BioGill, John West, explained, "Our concept is to create the perfect, oxygen rich environment so the microorganisms can perform at their best, consuming pollutants from the wastewater."

The breakthrough BioGill Towers are above ground biological bioreactors which are proving particularly effective in reducing soluble nutrients such as BOD, COD and nitrogen, as well as fat, oil and grease.

The technology is also an ideal performance boost for existing wastewater treatment plants, with excellent results recorded in the Philippines and the Middle East.

### Save on energy use

Conventional submerged wastewater systems aerate the water to provide oxygen for the microorganisms. This aeration process is inefficient, energy hungry and expensive.

BioGill technology takes a more innovative approach. Heat generated by the biofilm creates natural convective air flow inside the unit, so no powered aeration or energy hungry blowers are required.

"From confectionery producers, breweries, wineries, dairies and meat processors, our bioreactors are reducing the nutrient load in wastewater and helping producers meet environmental targets," said John.

More and more food & beverage producers are seeking low energy, low cost biological water treatment solutions. To learn more about reducing pollutants in wastewater, please contact BioGill on P: + 61 2 8543 2200 or E: info@biogill.com.

BioGill Operations Pty Limited  
www.biogill.com



### Sweet success

A multinational confectionery company, based in regional NSW, was facing increased discharge fees for its high-sugar wastewater. Nine BioGill bioreactors were then retrofitted to the existing treatment plant to boost performance.

Operating since 2015, the average BOD discharge is now 284 mg/L from an influent BOD of 2,330 mg/L and well within the compliance standards from the local water authority.

By reducing BOD onsite, the company benefits from significant savings in discharge fees and helps protect the local environment and waterways.





## Oil-free compressor

As a true variable speed oil-free compressor for critical oil-free applications, Ingersoll Rand's Nirvana Oil-Free offers the highest quality of air and the greatest reliability for the food and beverage industry.

Food product recalls and food safety concerns due to contamination are increasingly influencing consumer shopping behaviour. Oil contamination during manufacturing processes involving compressed air is an avoidable risk that can significantly impact an end product.

To eliminate the risk of oil contamination, it pays to consider an oil-free air compressor that meets the 'Class 0' air quality standard — the most stringent classification for air quality. Ingersoll Rand's Nirvana Oil-Free compressor range has achieved Class 0 certification through rigorous testing by TÜV Rheinland, a global leader in independent testing and assessment.

Besides consistently pure air, the two-stage compressor offers minimised downtime associated with cleaning filters and other air system components and fewer rotating parts than any other rotary air compressor in its class.

Its Hybrid Permanent Magnet (HPM) motor has no bearings, thus raising the standard on compressor reliability, and there are no pulleys, belts or couplings to wear out or need replacing as the HPM motor directly drives the compressor. The compressor features IR's reliable two-stage oil-free airoend.

CAPS will be exhibiting the compressor on stand P52 at Foodpro 2017 from 16–19 July at the new Sydney International Convention Centre.

**CAPS Pty Ltd**

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

## B2B software

The ABML UBFG1 software is a B2B platform that simplifies product data management and B2B transactions between trading partners across the supply chain process for organisations in the FMCG industry.

It has been officially certified by GS1 Australia for interoperability with trading partners using the National Product Catalogue.

The product is a data synchronisation system for the Australian and New Zealand markets, allowing trading partners to automatically exchange product details, pricing, and trade and marketing information across all product categories.

**ABML**

[www.abml.com.au/index.html](http://www.abml.com.au/index.html)



## Pressure transmitter for food and beverage applications

Bestech Australia has introduced a Flush Diaphragm Piezo-resistive Pressure Transmitter for the food and beverage industry, to monitor pressure and level in pipes, tanks and filters. The transmitters have been IECEx approved, meaning they are safe to come into contact with foodstuffs. The robust, stainless steel build with a flush diaphragm ensures cleaning is thorough and easy.

Offering accuracy of 0.25% FS and a measurement range of -1 to 350 bar, the transmitters have an operating temperature range of -30 to 80°C. The devices have a protection level of IP67, IP68 with cable connection and output signals of 4–20 mA, 0–5 VDC, 0–10 VDC, etc. The transmitter has long term stability of <0.2% FS/year, with low static and thermal errors.

**Bestech Australia Pty Ltd**

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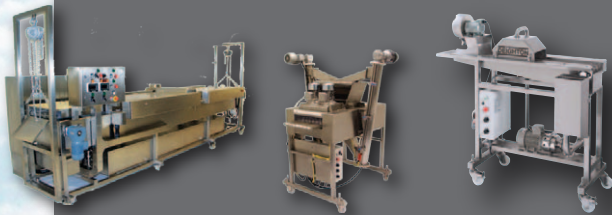


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# Self-cleaning machinery for the food industry is getting closer

**The whole food and beverage industry would love equipment that is self-cleaning, anticorrosion, antibiofouling, antimicrobial and has low friction resistance.**

**A**nd this aim is getting closer thanks to a European team of researchers from Università degli Studi di Parma, Universität Stuttgart, Centre Technologique ALPhANOV, Raylase AG, Ecor Research SPA, BSH Electrodomesticos Espana SA and Kite Innovation (Europe) Ltd who have joined forces in the TresClean project (high Throughput laser texturing of Self-CLEANing and antibacterial surfaces).

This consortium aims to demonstrate how high-throughput laser-based manufacturing can be applied to the production of plastic and metal component parts to create fluid repellent and antibacterial surfaces. High among the numerous industrial applications which can gain from functionalised surfaces is the cleanliness and the asepticity of machine parts for the food industry.

The team was inspired by the mechanisms with which some plants, such as the Lotus, make their leaves fluid-repellent. These leaves suggested the possibility of creating metal surfaces that reduce wettability and prevent bacterial adhesion.

The TresClean team is using high-average power ultrashort-pulsed lasers to create a surface topography on metal sheets that duplicates the Lotus leaf surface and so prevents liquid adhesion. This topography is able to capture miniature pockets of air that minimise the contact area between the surface and liquids.

Professor Luca Romoli, Project Coordinator of TresClean, explained: "Lotus leaves keep themselves clean thanks to particular surface texture enabling water to stay as spherical droplets by preventing 'spreading'. Under these conditions, bacteria do not get a chance to stick because the

contact with the metal surface and the liquid is reduced significantly. In this way, with laser it is possible to create on metal surfaces an antibacterial topography without adding chemicals."

Metal surfaces undergo a specific laser marking process, using innovative optical devices for common industrial use: ultrashort-pulsed lasers, but with high-average power, are used in combination with high-performance scanning heads by utilising an innovative beam delivery method enabling movements of up to 200 m/s.

In this way, technology developed by TresClean is able to perform stainless steel surface marking of 500 cm<sup>2</sup> in less than 30 minutes. In early 2015, the existing production methods were only able to create 0.6 mm<sup>2</sup> of these specific structures in 30 minutes — now TresClean has sped up the process making it 156 times quicker than before.

Professor Romoli estimates that TresClean could have its products ready within 2 years.

Initially aiming its product at machine parts for the food industry, TresClean hopes to make a significant impact on productivity: "Vats in milk factories need to be cleaned every 6–8 hours to avoid the exponential growth of bacteria. This hinders usage and therefore affects output," Romoli said.

"By saving hours per day in cleaning, it will yield an efficiency improvement stemming from fewer sterilisation cycles and less cleaning time within production as a whole. This will also reduce energy consumption as a result of fewer cleaning phases making food production quicker, safer and more profitable."

Professor Romoli sees long-term possibilities and implications for other sectors besides the food farming industry.



# Sustain Quality

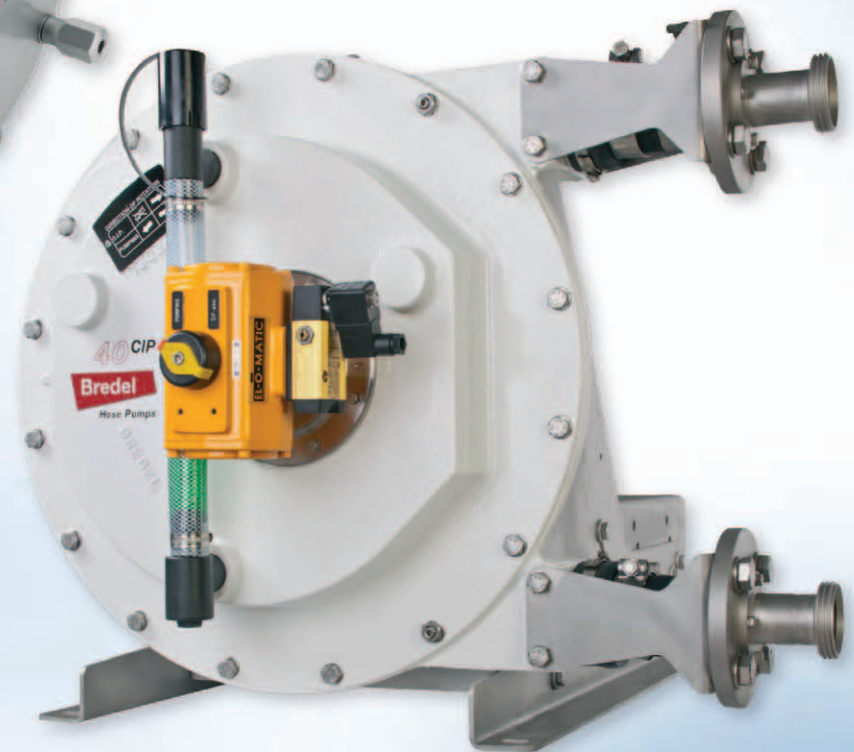
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## How to stop mould growing on fresh food

A chemical-free treatment for fresh produce that increases shelf life, prevents moulds and decay, and reduces food wastage is under development by plant disease researcher Dr Kirsty Bayliss and her Murdoch University team.

Plasma technology is being used to kill the moulds that grow on fruit and vegetables, making the fresh produce healthier for consumption and increasing shelf life. Titled 'Breaking the Mould', the technology has been found to be so successful in extending the shelf life of fresh food that it has been recognised as a potential contributor to improving global health outcomes through food. Dr Bayliss has been named as a 2017 LAUNCH Food Innovator and she will be presenting her technology at an intensive global forum on food choices in San Francisco.

"I will be presenting our research to an audience comprising investors, company directors and CEOs, philanthropists and other influential people from organisations such as Fonterra, Walmart, The Gates Foundation, as well as USAID, DFAT and even Google Food! What is really exciting is the potential linkages and networks that I can develop; already NASA are interested in our work!" said Dr Bayliss. "Our technology will directly address the global food security challenge by reducing food waste and making more food available for more people."

Dr Bayliss's team has been working on preliminary trials for the past 18 months and is now preparing to start scaling up trials, working with commercial production facilities.



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## Pork industry's autism and agriculture employment project

An initiative to employ autistic adults in animal care positions in the Australian pork industry has been backed by Pork CRC and the South Australian government, who have contributed \$150,000 towards the project.

Pilot projects in SA and Queensland — conducted by Autism CRC and SunPork Farms — will employ a minimum of four autistic adults in animal care positions within SunPork Farms operations in each state.

Collectively, development and assessment of the program represents a financial commitment by SunPork Farms, Autism CRC and Specialisterne exceeding \$800,000.

Goals for the program include:

- identifying and employing diverse skills and talents of autistic adults in animal care;
- developing innovative solutions that continue to provide optimal welfare for livestock;
- building capacity within the agricultural sector to employ autistic adults.

The projects offers life-changing opportunities for people on the autism spectrum and further improvement in the welfare of livestock.

Pork CRC CEO Roger Campbell said research had clearly demonstrated the link between good stockmanship and good productivity. "With this in mind, I believe we can continue to improve welfare and productivity outcomes by embracing a new group of enthusiastic, incentivised piggery workers."

SunPork Farms is seeking eight motivated individuals to fill pig care positions, with four to be based in the Wasleys and Sheoak Log regions of South Australia and four based one hour outside Dalby on the Queensland Darling Downs. Queensland applications close at 5 pm, 30 October and SA applications at 5 pm, 18 December.

## PureCircle doubles capacity of stevia plant

Global stevia producer PureCircle has completed a \$42 million expansion of its stevia plant in Malaysia.

The expansion will enable PureCircle to double its production capacity, focusing on more efficient extraction and processing from sustainably grown stevia leaf and purification for its next generation of stevia ingredients.

Innovations that have been incorporated into the new facilities include a dedicated line for PureCircle's Zeta Family ingredients, which comprise sugar-like steviol glycosides such as Reb M and Reb D and allow for the deepest calorie reductions by food and beverage companies.

The fully automated expansion in Enstek, Malaysia, will bring the employment at the facility to almost 600 people.



## Spray dry nozzles

Increased scrutiny of milk powder and infant formula production plants has seen the need for higher levels of both cleaning and hygiene.

One of the most critical parts of the production process is the spray dry nozzle system. Spray dry nozzles are precision components and small in size. Nozzles that are not properly maintained can affect powder quality and cause unnecessary contamination. The components can suffer damage during operation and cleaning. Build-up of burnt liquid inside the cap chamber, outer edges of the cap or near the threads is a common problem.

The Click&Dry Spray Dry Series by Spray Nozzle Engineering has made cleaning and hygiene in this area easier and safer.

The system is designed with improved cleaning and maintenance in mind. With its smooth cap chamber technology, nozzle caps in the series do not use O-Ring sealing grooves in the cap, thanks to the push fit CCT (concentric clasp technology). Hygiene is improved with a totally smooth and easy to clean cap chamber design.

Added to this is the easy-clean large thread system, a standard feature that makes the nozzle system safe and easy to disassemble.

If heavy product adhesion is a problem, the series can be ordered with optional screw clasp technology, giving users easy removal, without wear part breakage.

Engineers have improved the spray dry series to address all areas of performance including easier cleaning, productivity, powder quality, faster change-outs and long-term cost savings.

For more information, click [here](#).

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## 21" stainless steel panel PC

Interworld Electronics has released the APC-3296P stainless steel all-in-one panel PC from Apex. The PC is housed in a fanless stainless steel fully sealed case that provides IP66/IP69K protection.

IP69K extends the ingress protection ratings to ensure equipment can withstand high pressure and high temperature hose-down and is often required for the sanitisation of equipment used for food processing. A crevice-free full flat bezel with smooth edges prevents contamination and assists the cleaning process.

The APC-3296P is supplied with an internal 21.5" full HD 1920 x 1080 resolution LCD and projected capacitive touch screen, making it suitable for operator panel and HMI control applications.

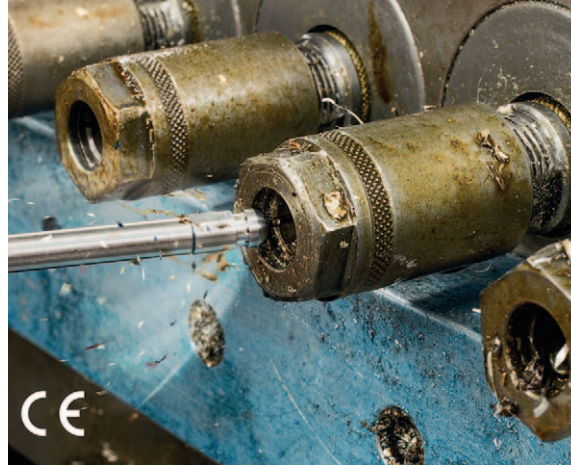
The device features a built-in, energy-efficient Intel 6th Gen. Core i5-6300U processor with up to 16 GB of DDR3L memory. An internal 2.5" hard drive bay is provided for system and data storage. Internal expansion slots allow two full-size Mini-PCIe cards to be installed. All I/O connections use M12 waterproof connectors. Two COM ports, two USB 2.0 ports, one Gigabit Ethernet port and a 12 VDC power connection are provided.

The PC is only 55 mm deep and can be VESA 100 mounted, allowing the panel PC to be ergonomically positioned for operator convenience.

The APC-3296P can operate in temperatures ranging from 0–45°C and is compatible with Windows operating systems, allowing it to support a wide range of off-the-shelf and custom-developed industrial applications.

**Interworld Electronics and Computer Industries**

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



## Back blow air nozzle

The EXAIR Model 1004SS M4 back blow air nozzle has been designed to deliver the smallest, most effective airflow for blowing debris and liquids from small pipe or hose inside diameters, channel, bores, holes, internal threads and other internal part features.

An array of holes provides forceful 360° airflow to clear out coolant, chips and light oils from machining processes. This nozzle prevents blowing chips further into a part, tube or pipe and eliminates any safety hazard created by blowing debris out the far end of a pipe or tube.

The back blow air nozzle thread is M4 x 0.5 and manufactured with a small profile. This nozzle will fit inside openings as small as 6.3 mm and is effective on diameters up to 25.4 mm. It is constructed from type 316 stainless steel, to provide durability and resistance to corrosion. Installation is simplified and a secure fit is assured with flats milled on the body. Since airflow is directed back towards the operator, personal protective equipment is recommended.

Chip shields to protect the operator from the exiting debris are available. Extension pipes in 152, 305, 610 and 914 mm lengths provide necessary reach for cleaning out longer tube and pipe diameters.

The product has a low 80 dBA sound level and meets OSHA noise requirement 29 CFR 1910.95(a).

**Compressed Air Australia Pty Ltd**

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

## Visual workplace tools

Wells Hygiene has developed a range of visual workplace tools, including the 5S Shadow Board cleaning station, to assist companies to enhance efficiency and safety.

Efficiency and safety are achieved not by having a lot of tools, but by having the right tools to work with. Tools should have an ergonomic, durable design, be colour-coded and carry the correct approvals, such as FDE and EU Glass & Fork.

The tools also need to be located and stored in such a way so that production team members can easily and safely access them. In general, workstations should be not more than 10 paces from team members' place of work.

Wells Hygiene provides site surveys to assist with implementing a thorough workplace hygiene/5S equipment storage/colour-coding solution. The company also develops and implements customised signage and storage solutions for engineering parts and mechanical tools.

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# Making better batch-fried chips

**An integrated frying, seasoning and packing system helps Preziosi Food enter the batch-fried chips market.**

**W**anting to add batch-fried chips to its existing range of snack products, Italian snack manufacturer Preziosi Food (Mitica) approached tna. The company wanted a supplier that could deliver consistent quality, flexibility and performance for every section of the production line, including frying, seasoning and packaging, while maintaining the level of quality for which Preziosi is known.

## High-performance frying

Preziosi Food needed a high-performance frying system that could efficiently cook thicker potato slices and deliver the colour, texture and flavour needed for the perfect chip. The company found the answer in FOODesign (from tna) and its automated, direct-fired batch-pro 12. Suitable for cooking a range of root vegetables, including potatoes, the system's continuous oil filtration system helps remove both fine and large particles to ensure chips are cooked in the freshest oil possible. Oil management is essential to high-performance frying and chip quality. When cooked, potato slices take on 23% of the oil, meaning 77% remains after the batch is complete. The remaining oil is subsequently filtered out and blended with fresh oil to return levels to 100%.

Alongside continuous oil circulation, full temperature control is also maintained through constant and zone control systems, essential for optimal heat regulation in the cooking and frying process. As such, overheating of the oil, and any subsequent caramelisation and browning of the product, is prevented, and the company is able to achieve a consistent chip colour.

In addition, Preziosi Food was also looking to meet specific production targets. This meant it required a system that could fry high volumes of product without raising operating costs. Thanks to the system's quick heat recovery capabilities, the FOODesign direct-fired batch-pro 12 optimises production by ensuring the oil returns to optimum frying temperature quickly and efficiently. As a result, Preziosi Food now processes 230 kg/h of finished product.

## Consistently flavoured

Seasoning plays an important role in a product's overall taste, texture and appeal. Once the flavour for the new product line was decided, Preziosi Food required a flavouring system that could coat irregular-shaped products consistently and with ease for optimum taste and appearance on every chip produced. In addition, application accuracy was a key consideration for the snack manufacturer. Applying an incorrect level of seasoning can have a significant impact on both input costs in terms of raw materials and wastage costs from rejected products that are either over- or under-seasoned.

In light of these requirements, tna installed its on-machine seasoning (OMS) system, the tna intelli-flav<sup>OMS</sup> 5, to apply seasoning to Preziosi Food's salted range of batch-fried chips. Featuring a responsive variable mass seasoning mechanism with dynamic vibratory weigher, the tna intelli-flav<sup>OMS</sup> 5 directly controls oil spray and powder flow into the drum. This enables an accurate, proportional amount of seasoning to be evenly applied to the product for improved coverage and flavour dispersion, meeting Preziosi Food's objectives for a high-quality, evenly seasoned end product.





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Further performance benefits are achieved through the enhanced position of the scarfplate on the machine infeed. Mounted to the edge of the drum, the scarf better directs the product into the spraying and flavouring area, providing even seasoning for every batch of chips. Additionally, the scalloped infeed conveyor design allows more product to enter the seasoning drum, while also helping to control product direction for greater seasoning accuracy and reduced waste. This helped Preziosi Food achieve cost savings and ultimately increase profitability.




**“** For Preziosi Food, adding the tna robag<sup>FX</sup> 3ci to their production facilities meant doubling productivity. **”**

In addition, the company was also looking for a seasoning system with the flexibility to meet its future flavour requirements. With plans to expand its range and add additional flavours to the new line, it was crucial the system would be able to handle the required seasoning type and perform fast flavour changeovers when required. tna's OMS equipment is fully integrated with spray and flavour injection systems which are suitable for both wet, dry and slurry seasoning applications, offering Preziosi Food flexibility for its forthcoming needs. Furthermore, the tna intelli-flav<sup>OMS</sup> 5 is designed so all parts that are in contact with the flavourings can be cleaned and replaced within a few minutes. This ability to clean equipment and perform product changeovers in the shortest amount of time will not only allow Preziosi Food to adhere to food safety guidelines, but also maintain profitability by keeping downtime to a minimum.

### Top bagging performance

In an effort to take efficiency to the next level, Preziosi Food was looking to replace its existing bagger with an automated packaging system that was easy to use, while also optimising throughput rates. With a relatively limited amount of space available, a key deciding factor for the manufacturer was system footprint.

The tna robag<sup>FX</sup> 3ci was the obvious solution, reaching speeds of 180 bags/min (bpm) while offering efficiencies of up to 99% of target output. For Preziosi Food, adding the tna robag<sup>FX</sup> 3ci to their production facilities meant doubling productivity. In addition to meeting their throughput objectives, tna's robag<sup>FX</sup> 3ci also enhances packaging accuracy with a rotary jaw design that uses impulse sealing technology. As a result, the new system now helps Preziosi Food ensure high-quality, consistent packaging for optimum consumer appeal, as well as reduced packaging film waste, translating into significant cost savings.

With little floor space available, tna not only provided Preziosi Food with a system that allows them to make the most of the resources available, but also meets their requirements in terms of product throughput and bag quality. 

tna solutions Pty Ltd  
www.tnasolutions.com

# Chocolate production relies on clean compressed air

The town of Wernigerode, in the foothills of the Harz Mountains in central Germany, is straight out of a fairytale, complete with half-timbered houses, a medieval town hall and castle — and chocolate!

Chocolate has been manufactured in the town for over a century and, while the tradition continues, Wergona Schokoladen's manufacturing methods are very much 21st century.

## A fast-growing 'chocolate hub'

When Wergona opened a new production building in 2003, the company had 56 employees and was manufacturing around 2000 tonnes of chocolate annually. Several expansions later, the production area now cover 24,000 m<sup>2</sup>, where 250 permanent employees produce around 15,000 tonnes of chocolate products every year.

Wergona manufactures the range for the famous Friedel and Gubor brands, as well as chocolate products for leading retail chains. The proprietary chocolate masses, for which there are 57 basic recipes, are processed at a wide variety of casting plants. Up to 1.6 million individual products are manufactured and packed every day at one of two state-of-the-art rotary plants.

## The essential role of compressed air

In chocolate production, compressed air is essential. Even the system of tubes for conveying the chocolate masses to the casting units is controlled by pneumatically activated valves.

The plants themselves feature numerous pneumatic drive elements and compressed air is also used as a process medium, such as when removing the powder from jelly products produced by mogul plants and for cleaning the plants.

Chocolate is a very sensitive foodstuff, and every effort must be made at the production and packaging stages to prevent contamination with even the faintest traces of mineral oils. So when the compressed air station was no longer suitable for further expansion, it was clear that oil-free compressors should be used to meet the tough hygiene standards which apply across the business.

## Wanted: energy-efficient oil-free compressors

Wergona opted for a concept devised by Druckluft Krenge,

a specialist provider, who recommended the installation of four oil-free piston compressors from the Champion range by CompAir.

The systems are now operational, with each compressor delivering a maximum 9.1 m<sup>3</sup>/min of compressed air to the 8-bar network. This adds up to a maximum volume of 36.4 m<sup>3</sup>/min, of which Wergona is currently using around two thirds, providing plenty of room for additional use.

## Four systems, eight power levels, low consumption when idle

The four systems providing the compressed air combine eight power levels, since piston compressors can be operated at two power levels. In the case of half load, the pistons only compress upwards; at full load they compress both upwards and downwards. The system is characterised by a high level of efficiency, even at half load; in comparison to full load, the energy consumption in this operating mode is 53%.

A narrow pressure band can be achieved with this mode of operation and the compressor is associated with very low consumption when idle.

## Integrated heat recovery

The Champion machines at Wergona are of the water-cooled variety, as the compressor station is located in a central position near cool chocolate production and so the discharge of warm air is unwelcome. However, the higher compression temperature associated with piston compressors, as compared with screw compressors, is advantageous from a processing perspective, because the heat is recovered and used within the network.

Chocolate production is

ultimately a temperature-controlled process and a heat source is required to heat the chocolate masses.

In terms of control, the four compressors are connected together whereby one is the master system and the other three are 'slaves'. This has the benefit of keeping the control technology comparatively simple.

The system now combines energy efficiency with excellent production reliability and the company's management has calculated that it will make annual energy savings of €8,000.

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# Getting food into the US

## Understanding and applying USFDA Foreign Supplier Verification Program (FSVP) rules

*Charles M Breen\**

**A**s the USFDA's Food Safety Modernization Act (FSMA) rules go into effect, one area of particular concern to foreign firms is the Foreign Supplier Verification Program for Food Importers (FSVP Rule). Under this rule, US food importers are now responsible for assuring that the food they import into the US complies with FDA requirements. Instead of being limited to taking action against violative food, FDA is now equipped to take regulatory action against importers that fail to provide necessary assurance of food safety.

Under FSVP, an importer's basic responsibilities are, for each food being imported, to:

- determine hazards that, in the absence of controls, could cause illness or injury;
- evaluate the risk, using hazard analysis;
- evaluate the foreign supplier's performance;
- perform supplier verification activities.

Briefly, US food importers are now responsible for assuring compliance with FDA standards and requirements. Importers must determine that their suppliers are in compliance with FDA requirements or that the supplier is in compliance with food safety regulations or relevant laws in the country that FDA recognises as equivalent. (At present, New Zealand and Canada are the only countries officially recognised as comparable to the US. Negotiations are underway with Australian food safety authorities.)

In addition to the food itself, FSVP also includes food contact surfaces, such as packaging. Packaging manufacturers are not required to register with the FDA, however, the language requiring FSVP does not exempt food contact surfaces.

FSVP is challenging because not all rules apply to all firms. Some importers will qualify for an exemption, exception or modification of FSVP, based on what is being imported, the food safety system in country of origin, the size of the importer and the size of the foreign supplier. Even with these modifications, FDA estimates that approximately 55,000 importers will be covered by FSVP or some portion of it.

### FSVP exemptions

FSVP does not apply to the following foods:

- Fish and fishery products (in compliance seafood HACCP in 21 CFR 123)
- Juice (in compliance with juice HACCP in 21 CFR 120)
- Food for research or evaluation
- Alcoholic beverages
- Meat, poultry and egg products regulated by USDA
- Food imported for personal consumption
- Food that is transshipped through the United States
- Food that is imported for processing and later export
- US food that is exported and returned without further manufacturing or processing in a foreign country (US foods returned).

There is also a partial exemption for microbiological hazards for importing low-acid canned foods (LACF), provided the importer can verify and provide documentation that the food was produced in accordance with low acid canned food (LACF) requirements (21 CFR part 113). Chemical and physical hazards not controlled by the LACF rule, if any, must be documented as controlled under FSVP.



### FSVP modified requirements

Some importing firms will find their requirements under FSVP are modified. There are many examples, some of which are:

- When a US facility's manufacturing process controls the hazards of the imported food, then the US facility is considered in compliance with most of the FSVP rule.
- When a food being imported does not have any identified hazards requiring control, then the US facility is considered to be in compliance with most of the FSVP rule.
- If the US facility has implemented a supply-chain program for the food in compliance with either Preventative Controls for Human Food (PCHF) or Preventative Controls for Animal Food (PCAF) requirements, the US facility is considered to be in compliance with most of the FSVP rule.

There exemptions are provided to some very small suppliers, those defined as less than US\$1 million in sales of human food a year, or less than US\$2.5 million in sales of animal food per year.

The FSVP Rule is a major element of USFDA's newest FSMA regulations. It requires US importers to make a thorough assessment of food safety at foreign food manufacturers. Those foreign manufacturers may need to revise some of their processes and/or documentation practices to ensure compliance with FDA's import regulations. US importers are required to know and verify that imported food is in compliance with FDA requirements.

Foods found not to be in compliance risk costly detention and in some cases disposal at the US border. Ensuring that food safety standards and procedures are well vetted and well documented will help firms navigate these challenging rules with greater ease.

Any food manufacturer has access to the resources of EAS Consulting Group. EAS can provide first-hand knowledge of US FDA requirements to help verify foreign suppliers are meeting US requirements. 

*\*Charles M Breen became an Independent Advisor, Food Safety Modernization Act and came to EAS Consulting Group after a distinguished career at the FDA working in areas such as HACCP and LACF and BSE prohibited materials. Mr Breen worked with the industry on compliance issues related to the Bioterrorism Act of 2003 and led field and HQ professionals in developing and implementing surveillance and compliance programs, and initial FSMA training implementation. His attention to detail has garnered him an FDA Award of Merit, Outstanding Achievement and five Commissioner Special Citations. EAS Consulting Group specialises in Food and Drug Administration (FDA) regulatory matters. The company's prime focus is to assist domestic and foreign food, dietary supplement, pharmaceutical, medical device, tobacco and cosmetic firms to comply with applicable laws and regulations.*

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# ACCC beef and cattle report

## highlights lack of transparency and alleged anti-competitive conduct



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**An ACCC study into Australia's cattle and beef sector has identified changes that are needed to improve transparency and competitiveness, highlighting shortcomings in price reporting, a lack of trust in the carcass grading system and concerns about anti-competitive conduct affecting competition in cattle and beef sales.**

**T**he findings arose from a detailed market study the ACCC conducted into beef and cattle markets in Australia, which involved consultations with all parts of the supply chain, and analysis of available market information and industry data.

The market study was prompted by a combination of issues raised through previous ACCC investigations and in the Senate Inquiry into the effect of market consolidation on the red meat processing sector.

"Many Australian cattle and beef businesses successfully operate in competitive export markets, but there are issues that need to be addressed to improve competition along the domestic supply chain," ACCC Chairman Rod Sims said.

### Report recommendations

The ACCC's final report makes 15 recommendations on issues including:

- improving price information by requesting that meat processors publish price grids for sales made direct to processors. This will make it easier for producers to consider and compare price offers. Nationally, the vast majority of prime cattle are sold this way;
- an increase in the frequency of AUS-MEAT's random and unannounced audits of cattle grading and trimming in processing plants to improve integrity in the system;
- the introduction of an independent dispute resolution process to apply across the industry;
- the prioritisation of objective carcass measurement technology to increase the accuracy and transparency of carcass assessments, and the sharing of the data arising from the technology with cattle producers;
- the introduction of a buyer's register and post auction buyer's report for major saleyards;

- expanded reporting of historical prices to make it easier for producers to compare prices paid for cattle sold through saleyards, paddock sales and over-the-hooks.


"There is a need for the entire industry to take responsibility for implementing these changes; therefore the ACCC recommends that the Red Meat Advisory Council assume responsibility for implementing the recommendations. We encourage industry participants to work constructively with the council to ensure that they are implemented as quickly as possible," ACCC Commissioner Mick Keogh said.

The ACCC is also concerned about suggestions of anti-competitive conduct that emerged during the market study.

"The ACCC takes allegations of this nature very seriously and we are currently assessing if there are any breaches of the law. Misconduct in the agriculture sector is an enforcement priority area for the ACCC this year and if we find substance to these allegations, we won't hesitate to take action," Sims said.

### Progress made since interim report

Since the ACCC's interim report was released in October 2016, industry has progressed some of its recommendations, including Meat and Livestock Australia's updated online market reports, and moves to introduce objective carcass measurement technology.

Keogh said the improvements to MLA's market reports allow producers to easily access historical price information so they can see which way prices are moving for stock. He also urged the industry to support the move to objective carcass measurement technology, to improve integrity and trust in the cattle grading system. 

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# IBM mobile technology lifts salesforce productivity for Patties Foods

As the manufacturer of Four'N Twenty Pies, Patties Foods is one of Australia's most iconic bakeries.

Patties recognised that in order to drive greater customer engagement, revenues and productivity, its field sales teams needed to spend more time with clients and less time in the office. A secure technology solution was required to facilitate this.

IBM business partner ISW worked with Patties Foods on its mobile strategy and selected the IBM cloud-based enterprise mobility management solution MaaS360 as a cost-effective and scalable solution that allows a mobile workforce to quickly and securely access the resources they need.

The solution will enable client facing sales teams to securely access real-time reports, customer profiles and set-ups, the latest promotions, merchandise and store planning tools, order placement, route planning and asset management applications from their mobile devices anytime, anywhere.

MaaS360's security functions have proven crucial as the business embraces a 'mobile-first' approach to growth, allowing the business to quickly wipe corporate data from individual devices without damaging personal information.

"We are seeing the business benefits of our people spending more time in the market with our customers, suppliers and distributors. MaaS360 helps support our field sales application and various other software to give our people the agility in the field to make more visits and deliver higher-touch results at each point, while also maintaining a secure and extremely well-maintained perimeter around our corporate network at minimal cost," said Zelko Erdec, general manager of information technology at Patties Foods.

The new solution has allowed Patties Foods to decommission three servers and reduce maintenance overheads to virtually



nil. Hosted on IBM Cloud, MaaS360 connects seamlessly with Patties Foods' on-premise data, email and other content repositories, providing significant OpEx cost savings without compromising users' breadth or depth of mobile access.

"Not only were patches and upgrades a burden with our previous solution, but each upgrade would also take anywhere from two days to a week to complete," said Zelko. "With the MaaS360 solution the usual maintenance hassles are all handled in the background, allowing our technology team to focus instead on optimising the mobile experience for our salesforce and providing applications that further enhance the customer engagement."

"Security is paramount. We wanted to provide Patties with a solution that was secure, and also delivered great functionality for the user, was simple to implement and could be scaled to meet the growing needs of their business," said Theo Vereker, cloud practice leader at ISW.

**IBM Australia Limited**  
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## All-in-one digital multimeter and thermal imager

The FLIR DM284 is an all-in-one true RMS digital multimeter and thermal imager targeting maintenance engineers, panel builders and electricians. It is suitable for use in the field and especially for those working on commercial electric and light industrial applications or on HVAC systems.

The product combines a digital multimeter with true-RMS measurement capability together with a built-in 160 x 120 thermal imaging camera. Use of the handheld device can therefore speed up troubleshooting by quickly pinpointing hotspots and visually guiding the user to the precise location of an electrical problem.

The integration of Infrared Guided Measurement (IGM) technology brings thermal-imaging camera technology to test and measurement instruments that see daily use in situations and applications in maintenance and HVAC systems on sites and in buildings. This means that the DM284 can save time, as well as increase operator safety by allowing users to identify possible issues in advance and from a totally safe distance.

Offering a specially designed easy-to-read big-digit screen, the product has a simple and intuitive user interface along with various thermal colour palettes. It offers a total of 18 measurement functions, including true-RMS, VFD mode for motors and drive controllers, low impedance (LoZ) measurements and non-contact voltage (NCV) detection. The device also comes with high-quality test probes and a Type K thermocouple input. The handheld unit has been drop-tested and is IP rated for splash and water resistance. It can also be used with the flexible clamp option.

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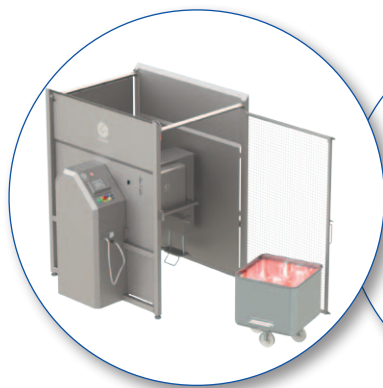
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# Application-specific solutions without upgrading your ERP

*Del Williams*

**Streamlining can involve managing sales, returns, food safety traceability, or marketing and distribution coordination uncovered by existing ERP systems.**

**A**lthough food distributors and manufacturers handle routine business with complex enterprise resource planning (ERP) systems, too often application-specific solutions can be left out. Tasks with forms requiring approvals through various departments not typically covered by an ERP system are particularly at risk.

Whether this involves managing sales, returns, food safety traceability, or marketing and distribution by certain target dates, successfully integrating all of these areas and more into an ERP system requires creating application specific solutions.

Ideally, the process would start with an automatically generated form at the point of sale, combined with a data-sharing and approval process that streamlines coordination throughout the company and its partners.

## **Streamlining for a national brand**

When a chocolate candy manufacturer and distributor grew rapidly into a nationally recognised brand, for instance, specific applications were left uncovered by its ERP system. This led to challenges in efficiently managing and coordinating its field sales targets, pricing, approvals, auditing and marketing.

Much of this process was time-consuming for its sales reps in the field, using a combination of email, phone, typed notes and Excel spreadsheets to take orders from supermarkets and convenience stores nationally.

An automated method to track and manage distribution, invoice the candy sold and meet the company's manufacturing quota was also required, but its ERP system was not set up to accommodate this. Better coordination among order changes, sales audits and invoice reconciling was also nec-

essary. The candy company sought to streamline its process from the point of order through manufacturing, distribution, delivery and invoicing.

This sort of situation leaves food distributors and manufacturers with the unpalatable option of paying existing ERP providers to add new modules or programming to accommodate the required changes. However, this is often a costly approach that can take many months and hundreds of thousands of dollars to implement. Since this only addresses the challenge at hand, additional costs are required the next time the food distributors and manufacturers need tweaks to the system.

Fortunately, there are electronic document management solutions already being used in the industry that are designed to address just such scenarios.

## **Faster, cheaper workflow and auditing**

What many food industry manufacturers and distributors actually require is a quick, cost-effective way to add application-specific solutions without costly ERP upgrades. Such an electronic document management solution would be flexible enough to create a workflow system that allows individual departments to easily follow and approve documents wherever they go.

Now the advent of secure software-as-a-service (SaaS) solutions, tailored to the food industry's unique workflow requirements, is allowing seamless function with existing ERP systems.

One example, for instance, of this streamlined, workflow-based strategy is a cloud-based, electronic document management solution called Kern EDGE, by Kern, Inc., a docu-



ment output management company that services companies across the US, including one-third of Silicon Valley's largest companies.

Because the software suite is offered as SaaS and usable by anyone with a browser, it does not require any capital investment, requires minimal IT attention, can be connected to existing ERP or CRM solutions, and can go from concept to implementation in less than a month.


In order to streamline food companies' handling of workflow, the Kern-EDGE software suite is tailored to work seamlessly within the framework of each food company's workflow and applications. To ensure this, Kern consults with the company to understand their process, anticipate the flow of information, as well as identify and satisfy any existing business rules. A flowchart is created and approved and a proof of concept delivered in as little as a week. This workflow can later be modified if slight changes are required.

For instance, to improve workflow, customer communication, distribution by target dates and marketing exposure, Kern helped to automate the chocolate company's workflow process from taking the order through invoicing. To do so, they took the chocolate company's sales order form and business rules and created an online portal so their sales reps could log on from laptops by sales number ID and remotely submit orders. Since each entry automatically communicates with the com-

pany's ERP system, the Kern EDGE software suite acts like an extension of the system. It manages not only the customer order, their discount, order process and delivery date, but also workflows this data throughout the company to those who require it regardless of department — from accounting and distribution to marketing and advertising.

Unlike complex ERP software that must be programmed, the software suite is quickly adaptable to business process requirements, such as adding new offices, user groups and required authorisations. This flexibility is designed into the system because it is easily configured into an existing software engine as definable parameters, rather than programmed from scratch.

While the electronic document management software suite costs a fraction of ERP reprogramming and implementation, it is very secure. With built-in redundancies, backup power from Tier IV data centres and multiple layers of document security, it provides a safe, high-level private cloud solution.

For food manufacturers and distributors that seek to improve workflow and efficiency from their sales force onward, the bottom line is that such cloud-based SaaS solutions will allow them to nimbly adapt and respond to customers at a fraction of the time and cost of modifying their ERP system. 

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The range also includes food-grade products that perform as aerosols, gear and chain oil, airline and air tool oil and hydraulic oil specific for food processing equipment. These include leak inhibitors and seal conditioners; grease that is required in high-temperature operations; grease that repels water, lubricates and protects; and anti-seize, non-metallic, pressure-resistant lubricants.

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## Inline fat measurement and contaminant detection

The Eagle Product Inspection FA3/M is a multi-application system that provides inline fat measurement and contaminant detection for fresh, chilled, frozen and hot-boned loose bulk, frozen or tempered (naked) meat blocks and unwrapped meat conveyed in plastic crates.

Contaminants such as calcified bone, metal fragments, glass shards and some rubber and plastic components can be detected with high levels of accuracy, while other measurements, such as weight, component counts and chemical lean (CL) values can be calculated simultaneously. In addition, the ability to fine-tune the image processing elements on an application basis reduces false reject rates and therefore wastage percentages.

The systems have been designed for hygienic or high wash-down environments and are easy to clean and easy to maintain, further enhancing productivity.

**Food Processing Equipment Pty Ltd**

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## Compact and wide-temperature GPU computing platform

Neusys Technology's Nuvo-5095GC is a compact and wide-temperature GPU computing platform with nVidia GeForce GTX 950/GTX 1050 and a 6th-Gen Intel Core processor. The processor's performance is suitable for emerging high-end requirements, while its fanless design provides a wide temperature range of -25°C to +60°C.

The device is based on the Intel Skylake platform, which supports 35/65W 6th-Gen Core processors and up to 32 GB DDR4 memory. I/O functions include USB 3.0 ports, COM ports and GbE ports, making it suitable for connection to many external devices. The PC is compact, with a 240 x 225 x 110 mm footprint.

Incorporating a full-sized modern GPU into a smaller form factor unit, the PC is suitable for emerging applications of CUDA computing such as autopilot, deep learning and virtual reality. It features Neusys's cassette technology and thermal design that will help dissipate the heat that is generated from the GPU, enabling the unit to operate the GPU at 100% load while still operating at +60°C.

The PC is compatible with MezzIO interface for function expansion (digital I/O, RS-232/422/485 ports and ignition control) and accommodates two 2.5" SATA HDD/SSD with RAID 0/1 support.

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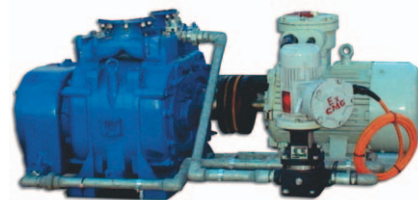
Northey's hook and claw compressor has contra-rotating rotors that do not touch, so

there is no wear between the components and no need for lubrication. The absence of oil means there is no contamination of the process gas. It is oil-free in operation and rotors and bodies are machined to close tolerances from solid billet or castings.

Every casting is pressure tested to a minimum of 5 barg and every completed compressor or vacuum pump undergoes performance and reliability testing. An ATEX version is available for the oil and gas industry.

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# No animal required, but would people eat artificial meat?

Clive Phillips\* and Matti Wilks\*\*

**Futurists tell us that we will be eating in vitro meat (IVM) – meat grown in a laboratory rather than on a farm – within five to ten years.**

VM was first investigated in the early years of this century and since then criticisms of farm animal production systems, particularly intensive ones, have escalated.

They include the excessive use of land, energy and water resources; local and global pollution; poor animal welfare; a contribution to climate change; and a unhealthy eating habits and disease in humans.

At the same time, human (and livestock) population growth continues, farming land is requisitioned for urban expansion and meat consumption per person is rising.

So we want a new source of meat – or do we?

## Reaction to artificial meat

Growing meat artificially, under laboratory-type conditions, is not impossible on a large scale. But people's concerns about eating IVM have rarely been explored.

In a recent survey, published this month in PLOS One, we investigated the views of people in the United States, a country with one of the largest appetites for meat and an equally large appetite for adopting new technologies.

A total of 673 people responded to the survey, done online via Amazon Mechanical Turk, in which they were given information about IVM and asked questions about their attitudes to it.

Although most people (65%), and particularly males, were willing to try IVM, only about a third said they would use it regularly or as a replacement for farmed meat.

But many people were undecided: 26% were unsure if they would use it as a replacement for farmed meat and 31% unsure if they would eat it regularly. This suggests there is scope to persuade consumers that they should convert to IVM if a suitable product is available. As an indication of this potential, 53% said it was seen as preferable to soy substitutes.

## The pros and cons of IVM

The biggest concerns were about IVM's taste and lack of appeal, particularly in the case of meats seen as healthy, such as fish and chicken, where only two-thirds of people that normally ate them said that they would if it was produced by *in vitro* methods.

By contrast, 72% of people who normally eat beef and pig products would still do so if they were produced as IVM. Interestingly, about 4% of people said they would try IVM products of horse, dog or cat – despite these being meats that they would not currently eat.

The perceived advantages of IVM were that it was environmentally and animal-welfare friendly, ethical, and less likely to carry diseases. It could increase the proportion of happy animals on Earth if it replaced intensive farm animal production. By happy, we mean well nourished, comfortable, healthy, free from pain, and able to perform.

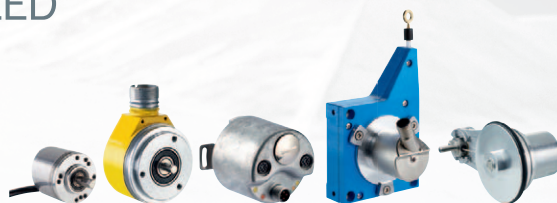
The disadvantages were that IVM was perceived as unnatural, potentially less tasty and likely to have a negative impact on farmers, by putting them out of business. >>





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“ As tissue engineering techniques improve, culturing meat *in vitro* also brings the opportunity to introduce health-promoting ingredients, such as polyunsaturated fats, more easily than in living animals. ”

### The IVM consumer

So who would be most likely to use IVM, and hence dictate the focus of advertisers' pitch?

Gender was the biggest predicting factor, with men more likely on average to say they would try IVM, whereas women were less sure. Men also had more positive views of its benefits.

Recognising that meat-eating men are often viewed as more masculine, it is not clear whether this prevailing attitude would change if men converted to eating IVM.

Those with liberal political views rather than conservative ones were also much more receptive to the idea, confirming their more progressive viewpoints generally, as well as their traditionally stronger focus on fairness and avoiding harm to others.

Vegetarians and vegans were more likely to support the benefits of IVM but least likely to try it. People who ate little meat were also more supportive, compared with big meat eaters.

### IVM on the menu

While a reasonably large proportion of the sample reported willingness to try IVM in the future, there appears to be hesitation around the idea of incorporating it into a daily diet.

Resistance came primarily from practical concerns, such as taste and price. But these are factors that are largely under the control of the manufacturers.

The concerns – about taste, price and impact on farmers – could all be effectively dealt with if there was sufficient financial advantage in producing IVM.

As tissue engineering techniques improve, culturing meat *in vitro* also brings the opportunity to introduce health-promoting ingredients, such as polyunsaturated fats, more easily than in living animals.

Another commonly cited concern was the perception that the product was unnatural. This may be similar to people's concerns about genetically modified (GM) foods – some of

those who oppose GM foods are moral absolutists who would not be influenced by any argument in favour.


By expressing concern about the naturalness of IVM, some people were suggesting that there are fundamental issues that would cause them to reject it.

But with a little investigation into the processing and production of some meat products today, they might soften their attitudes towards IVM.

If IVM doesn't take your fancy, lab-grown leather is actively being developed by a company that was dissuaded from producing IVM because it thought only 40% of people would even try it.

That was back in 2012 and now our survey has found that 65% of people surveyed in the United States said that they would definitely or probably try IVM. So maybe people are becoming more responsive to the idea as opposition to conventional animal farming grows.

Although ours was a relatively small survey in a developed country (with a huge appetite for meat!), one can speculate that people in developing countries might be less concerned about issues like the taste and natural appeal of IVM. They might view it as a valuable source of protein they would not otherwise get.

Perhaps the futurists are right and IVM will be what fills our dinner plates in the near future. 

This article was originally published on The Conversation.

\*Clive Phillips, Professor of Animal Welfare, Centre for Animal Welfare and Ethics, The University of Queensland  
\*\*Matti Wilks, PhD Candidate in psychology, The University of Queensland





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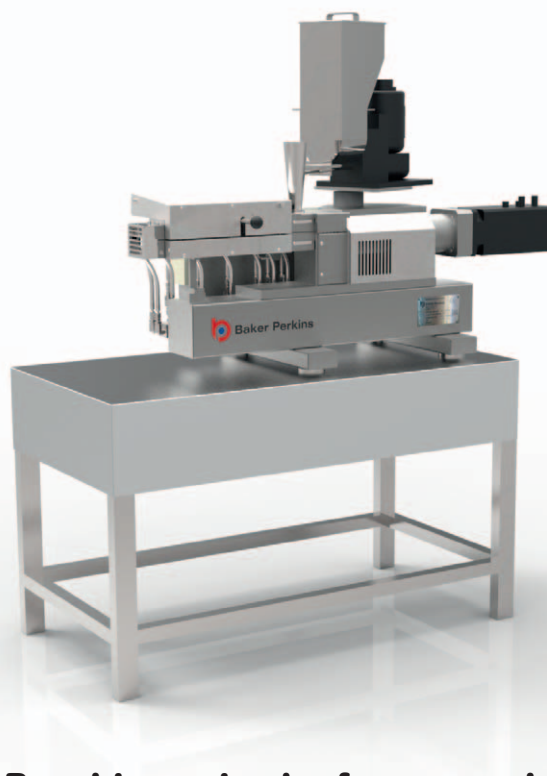


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## Benchtop extruder for research and product development

Baker Perkins has added a new version of the benchtop MPF19 to its range of twin-screw extruders for the food industry.

The extruder provides information for research and product development work in a variety of applications, including snack, cereal, ingredients and pellets, with scalable geometry to Baker Perkins' range of production extruders. The extruder is also used as a research tool in the academic world.

The benchtop extruder features a clam-shell barrel, which enables the machine to be stopped at any time with immediate access to view the state of material being processed. As adjusting the formulation, process settings and screw configurations are all straightforward, and the screw configurations identical in geometry to larger extruders, the extruder is a tool for comparing and establishing recipe formulations.

The control panel includes most of the features found on production machines and includes a full recipe management system holding up to 50 recipes, historical trending of data and connectivity to a PC to capture that data. Full automatic start-up and shutdown sequences mirror production extruders.

Available as a fully integrated package with onboard HMI or a standalone unit with a separate panel, the extruder provides outputs in the 5 to 25 kg/h range. Segmented screws allow great flexibility for profile design and splined agitator shafts maximise reliability.

**Baker Perkins Inc**

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## a2 Milk Company chooses quality management system with room to grow



Since 2012, international dairy nutritional company the a2 Milk Company (a2MC) has experienced an unprecedented period of growth, becoming the number one premium milk provider in Australia with a rapidly growing infant formula business and expansion into China, the UK and, more recently, the USA. The company produces full-cream, light and skim milk products alongside the a2 Platinum infant formula range.

Dandan Chen, head of quality for the company, said, "Following that growth, it became clear that we had to modernise our quality management system with software that would not only help us improve on our quality processes, but also be able to grow alongside us."

The company has chosen a cloud-based software solution from Ideagen. Ideagen's Governance, Risk and Compliance

(GRC) software solution will be implemented across the company's sites in Australia, America, China and the UK.

"We are a company that is forever changing and Ideagen Coruson's ease of scalability was particularly appealing. It suited our company growth strategy extremely well," said Chen.

Ideagen Coruson will become the company's global system for quality management, particularly helping staff focus on improving document management and document control.

Chen added: "Replacing our previous manual system with Ideagen Coruson will futureproof our business – it just wasn't sustainable for us to continue as we were doing."

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## Industrial-grade panel PCs

The Apex Technology ViTAM Series industrial-grade panel PCs are multiplatform-based PCs. Using ARM and X86 based processors, this includes the Intel Atom and Intel 6th generation iCore series, enabling it to deliver a system that is suited to various power needs. With a wide array of screen sizes available for 10.1" all the way up to 24" screens, there is a screen available to suit a range of industrial applications.

The product features a rugged design with an IP66/IP69K rated stainless steel enclosure. This enables it to withstand high temperatures (-20 to +60°C) and the ability to withstand being hosed by high-pressure water.

The PC uses an optical bonding LCD with antireflection technology. It is suitable for use in sunlight or other areas where bright light can affect a screen's readability. It also has high brightness up to 1000 nits for environments where harsh daylight is an issue.

The product is based on a modular design that allows different modules to be added to the system, including CAM, PoE, RFID and Wi-Fi/Bluetooth.

The PCs have been designed to meet the needs of a range of industries, which need a reliable system in rugged environments. These include food and beverage, manufacturing, factory automation, kiosks, digital signage and communications.

**Backplane Systems Technology Pty Ltd**

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

## 32" industrial panel PC

The ARCHMI-932 Series is a rugged industrial all-in-one HMI computer from Apex. Available from Interworld Electronics, the PC is housed in a fanless silver aluminium case that provides IP65 front panel protection and is only 70 mm deep.

The PC series is supplied with an internal 32" full HD 1920 x 1080 resolution LCD and projected capacitive touch screen, making it suitable for operator panel and HMI control applications.

Featuring a built-in energy-efficient Intel 6th Gen. Core i5-6300U processor with up to 16 GB of DDR3L memory, the PC also has two accessible internal 2.5" hard drive bays for system and data storage.

Rear I/O connections include two COM ports, four USB 3.0 ports, two Gigabit Ethernet ports, audio line-out and mic-in. An internal expansion slot allows two full-size Mini-PCIe cards to be installed. The product requires a 90~264 VAC power source and can operate in temperatures ranging from 0~50°C.

The device can be panel or VESA 200 mounted, allowing the panel PC to be ergonomically positioned for operator convenience.

The PC is compatible with Windows operating systems allowing it to support a wide range of off-the-shelf and custom-developed industrial applications. For applications requiring a smaller screen size, panel PCs can also be purchased with screen sizes ranging from 7 to 21".

**Interworld Electronics and Computer Industries**

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

## Stainless steel pressure transmitters

Turck has introduced the PT2000 line of pressure transmitters, which offer a welded, stainless steel measuring cell for increased durability and increased chemical compatibility. With no elastomer seals and all wetted materials in 316L stainless steel, the solution is capable of meeting the environmental needs in water pumping, hydraulic and refrigeration applications.

The transmitter housing is gel filled, eliminating problems caused by condensation in applications with a wide range of temperatures, such as pumping ground water. Additionally, the housing is more compact than existing solutions, making it suitable for applications with space constraints. The device is capable of handling pressures up to 1000 bar as well as process media up to 135°C.

The pressure transmitter comes equipped with a standard M12 connector that is available in multiple wiring configurations to allow for easy integration into existing applications. The device is also available with process connections such as NPT, BSPP and SAE, which are commonly used in hydraulic applications.

The pressure transmitter offers multiple output signals to provide additional options for users and allowing it to adapt to users' existing control circuitry: 4-20 mA, 0-10 V, ratiometric, 1-6 V and 0-5 V. Additionally, it carries an IP67 rating and has an operating temperature range of -40°C to 135°C.

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### Compact cylinders

SMC's JMGP guide cylinder and the compact JCQ Series compact cylinders have been designed with weight and space savings in mind and both deliver increased efficiency due to their lightweight nature, which could enhance cycle time.

The JMGP is a guide cylinder, featuring a dual rod, which has been designed for a variety of applications including pushing, clamping and lifting where there are space and weight restrictions in a transport line or for robotic manipulation and handling. The compact JCQ is suitable for similar applications where a short cylinder is required, but without the lifting capability.

Suitable for applications where pushing, lifting and clamping is required, the product is available in three mounting options with four possible piping directions.

**SMC Australia | New Zealand**

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

### Slip-resistant tapes and treads

3M's Safety-Walk Slip-Resistant Tapes and Treads improve traction and grip on slippery surfaces to prevent injuries.

The tapes and treads adhere to clean, dry surfaces and add a layer of protective textures. Thanks to pressure-sensitive adhesive backing, the durable tape minimises hazards involved with the wrinkling, curling, tearing, shrinking or lifting of the tape. The products help businesses conform with industry standards and recommended guidelines for slip resistance.

Standard rolls and pre-cut treads are available in a variety of sizes, colours and textures ranging from fine-resilient, medium-resilient, general-purpose, coarse and conformable material types to suit areas facing all types of challenges. Custom sizes, pieces and die-cut shapes are also available.

The range has been independently tested according to AS4586-2013 and depending on the product and application are suitable to demonstrate compliance to the required slip classifications. The tapes and treads are easy to apply, maintain and remove/replace as required.

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## Tank cleaning machine

The Alfa Laval TJ40G rotary tank cleaning machine uses a high-impact jet stream to effectively clean tough tank residues and minimise the risk of product contamination. The four-nozzle rotary jet head cleans tanks 60% faster than static spray ball technology, according to the company, which says the device uses less water and cleaning agents, thereby reducing operating costs by up to 70%.

The machine is capable of handling tough tank residues as well as solids up to 1 mm in the cleaning fluid in tank sizes 50–1000 m<sup>3</sup>. This is important for demanding process lines, such as applications within the brewhouse, where both the size and the amount of particles may be recirculated in cleaning media before completing the cleaning cycle.

As well as cleaning the tank interior, the device also cleans itself — inside and out. Its construction ensures that the flow of the cleaning fluid not only reaches the exterior surfaces of the rotary jet head, but also the critical interior components such as all bushings, bearings and inner surfaces.

Self-cleaning features include directional flow from small jets in the hub that clean the exterior of the machine. A low pressure loss over the machine provides increased cleaning efficiency compared to other tank cleaning machines running at the same inlet pressure. This results in a lower cleaning cost as the unit can run at lower pressure/flow compared to other tank cleaning machines.

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# Oil-free air and lower energy costs for dairy processor



Hochwald Erfstadt dairy in Germany is a rapidly growing site, with continuous investment in production needed to keep pace with consumer demand for a wider range of products, including fresh and long-life milk, cheese and yoghurt.

## High quality and safety standards

Compressed air is used at many points in the production process, such as when emptying tanks and during sterile filling, placing stringent requirements on its quality.

In order to achieve these standards, the Erfstadt factory operates two compressed air networks: one produces oil-free air for the central processing stages and a second, smaller network uses oil-lubricated compressors to supply the packaging machines, where the air does not come into direct contact with the product.

## Producing oil-free compressed air

Until recently the compressor station housed four CompAir piston compressors, which supplied around 68 m<sup>3</sup>/min of compressed air to the oil-free, 8-bar network. To optimise energy usage, Hochwald technicians developed a practical, demand-based control system for the four compressors. The machines are regulated at half load and controlled centrally, producing eight power levels which fit the demand profiles perfectly.

## Choosing Quantima

When Hochwald started considering the expansion of the compressed air station, it seemed obvious to install two further piston compressors in the space available. However, CompAir proposed a system comprising one new Quantima unit.

Compared to a conventional compressor of the same performance class, a Quantima compressor has less than half

the footprint. Hochwald elected to install one of Europe's first Quantima Q-43s, with a 250 kW drive and maximum volumetric flow of 43 m<sup>3</sup>/min.

## Using Quantima

As the largest machine in the station, the Quantima speed-regulated compressor handles the base load and, therefore, usually runs at full load. The piston machines are then activated in a cascade when the requirement exceeds 43 m<sup>3</sup>/min. A huge, 30 m<sup>3</sup> storage tank ensures that peaks in load are buffered. Shortly after Quantima was installed, a volumetric flow-recording unit was fitted for all lines and departments. As the compressed-air-related power requirement is known, this is enabling Hochwald to calculate the compressed air costs with great accuracy.

Using Quantima in place of a standard compressor can cut energy use by up to 25%. The variable-speed drive matches air output automatically to plant demand to provide the precise volume of compressed air needed, helping to minimise off-load running. When idling at 2.5%, a Quantima compressor requires just a fraction of the energy needed by a screw or standard turbo compressor.

Compressor operations are monitored by the intelligent Q-Master control system, which continually records and checks all system parameters. The system also allows for remote analysis and diagnostics of compressor performance.

Plant manager Ralf Fuchs said, "We always monitor the return on investment for any new equipment we purchase and features such as reduced energy demands of course impact on payback. Factors like energy saving and the compact design tipped the scales when it came to making this investment."

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# Methane from food production

## might be the next wildcard in climate change

*Pep Canadell, Ben Poulter, Marielle Saunois, Paul Krummel and Philippe Bousquet\**

**Methane concentrations in the atmosphere are growing faster than any time in the past 20 years. The increase is largely driven by the growth in food production, according to the Global Methane Budget. Methane is contributing less to global warming than carbon dioxide (CO<sub>2</sub>), but it is a very powerful greenhouse gas.**

Since 2014, methane concentrations in the atmosphere have begun to track the most carbon-intensive pathways developed for the 21st century by the Intergovernmental Panel on Climate Change (IPCC).

The growth of methane emissions from human activities comes at a time when CO<sub>2</sub> emissions from burning fossil fuels have stalled over the past three years.

If these trends continue, methane growth could become a dangerous climate wildcard, overwhelming efforts to reduce CO<sub>2</sub> in the short term.

Methane concentration pathways from IPCC and observations from the NOAA measuring network (Saunois et al 2016, Environmental Research Letters). The projected global warming range by the year 2100, relative to 1850-1900, is shown for each pathway.

In two papers (published here and here), we bring together the most comprehensive ensemble of data and models to build a complete picture of methane and where it is going – the global methane budget. This includes all major natural and human sources of methane, and the places where it ends up in methane 'sinks' such as the atmosphere and the land.

This work is a companion effort to the global CO<sub>2</sub> budget published annually, both by international scientists under the Global Carbon Project.

### Where does all the methane go?

Methane is emitted from multiple sources, mostly from land, and accumulates in the atmosphere. In our greenhouse gas budgets, we look at two important numbers.

First, we look at emissions (which activities are producing greenhouse gases).

Second, we look at where this gas ends up. The important quantity here is the accumulation (concentration) of methane in the atmosphere, which leads to global warming. The accumulation results from the difference between total emissions and the destruction of methane in the atmosphere and uptake by soil bacteria.

CO<sub>2</sub> emissions take centre stage in most discussions to limit climate change. The focus is well justified, given that CO<sub>2</sub> is responsible for more than 80% of global warming due to greenhouse gases. The concentration of CO<sub>2</sub> in the atmosphere (now around 400 parts per million) has risen by 44% since the Industrial Revolution (around the year 1750).

While CO<sub>2</sub> in the atmosphere has increased steadily, methane concentrations grew relatively slowly throughout the 2000s, but since 2007 have grown ten times faster. Methane increased faster still in 2014 and 2015.

Remarkably, this growth is occurring on top of methane concentrations that are already 150% higher than at the start of



the Industrial Revolution (now around 1,834 parts per billion).

The global methane budget is important for other reasons too: it is less well understood than the CO<sub>2</sub> budget and is influenced to a much greater extent by a wide variety of human activities. About 60% of all methane emissions come from human actions.

These include living sources – such as livestock, rice paddies and landfills – and fossil fuel sources, such as emissions during the extraction and use of coal, oil and natural gas.

We know less about natural sources of methane, such as those from wetlands, permafrost, termites and geological seeps.

Biomass and biofuel burning originates from both human and natural fires.

Given the rapid increase in methane concentrations in the atmosphere, what factors are responsible for its increase?

### Uncovering the causes

Scientists are still uncovering the reasons for the rise. Possibilities include: increased emissions from agriculture, particularly from rice and cattle production; emissions from tropical and northern wetlands; and greater losses during the extraction and use of fossil fuels, such as from fracking in the United States. Changes in how much methane is destroyed in the atmosphere might also be a contributor.

Our approach shows an emerging and consistent picture, with a suggested dominant source along with other contributing secondary sources.

First, carbon isotopes suggest a stronger contribution from living sources than from fossil fuels. These isotopes reflect the weights of carbon atoms in methane from different sources. Methane from fossil fuel use also increased, but evidently not by as much as from living sources.

Second, our analysis suggests that the tropics were a dominant contributor to the atmospheric growth. This is consistent with the vast agricultural development and wetland areas found there (and consistent with increased emissions from living sources).

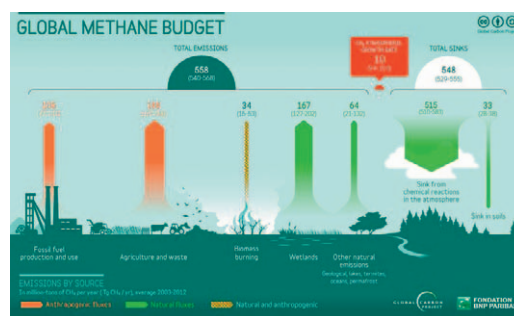
This also excludes a dominant role for fossil fuels, which we would expect to be concentrated in temperate regions such as the US and China. Those emissions have increased, but not by as much as from tropical and living sources.

Third, state-of-the-art global wetland models show little evidence for any significant increase in wetland emissions over the study period.

The overall chain of evidence suggests that agriculture, including livestock, is likely to be a dominant cause of the rapid increase in methane concentrations. This is consistent with increased emissions reported by the Food and Agriculture Organisation and does not exclude the role of other sources.

Remarkably, there is still a gap between what we know about methane emissions and methane concentrations in the atmosphere. If we add all the methane emissions estimated with data inventories and models, we get a number bigger than the one consistent with the growth in methane concentrations. This highlights the need for better accounting and reporting of methane emissions.

We also don't know enough about emissions from wetlands, thawing permafrost and the destruction of methane in the atmosphere.



Global methane budget 2003-2012 based on Saunio et al. 2016, Earth System Science Data. See the Global Carbon Atlas at <http://www.globalcarbonatlas.org>.

### The way forward

At a time when global CO<sub>2</sub> emissions from fossil fuels and industry have stalled for three consecutive years, the upward methane trend we highlight in our new papers is unwelcome news. Food production will continue to grow strongly to meet the demands of a growing global population and to feed a growing global middle class keen on diets richer in meat.

However, unlike CO<sub>2</sub>, which remains in the atmosphere for centuries, a molecule of methane lasts only about 10 years.

This, combined with methane's super global warming potency, means we have a massive opportunity. If we cut methane emissions now, this will have a rapid impact on methane concentrations in the atmosphere, and therefore on global warming.

There are large global and domestic efforts to support more climate-friendly food production with many successes, ample opportunities for improvement, and potential game-changers.

However, current efforts are insufficient if we are to follow pathways consistent with keeping global warming to below 2°C. Reducing methane emissions needs to become a prevalent feature in the global pursuit of the sustainable future outlined in the Paris Agreement. 🐮

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*\*Pep Canadell, CSIRO Scientist, and Executive Director of the Global Carbon Project, CSIRO; Ben Poulter, Research scientist, NASA; Marielle Saunio, Enseignant chercheur à l'Université de Versailles Saint Quentin; chercheur au Laboratoire des Sciences du Climat et de l'Environnement, Institut Pierre-Simon Laplace; Paul Krummel, Research Group Leader, CSIRO; Philippe Bousquet, Professeur à l'université de Versailles Saint-Quentin en Yvelines, chercheur au Laboratoire des sciences du climat et de l'environnement (LSCE), membre de l'Institut de France, auteur contributif d'un chapitre des deux derniers rapports du GIEC, Université de Versailles Saint-Quentin en Yvelines – Université Paris-Saclay, and Rob Jackson, Professor, Earth System Science and Chair of the Global Carbon Project, Stanford University*



## Precision coating method for granular material

Coating large volumes of granular material homogeneously is a significant challenge for industry. Now an Austrian team has developed a method, based on physical vapour deposition, to increase the quantity of coating without affecting the quality and homogeneity of the film.

In the study, published in *European Physical Journal D*, Andreas Eder from Vienna University of Technology and colleagues also developed a model capable of predicting the film thickness. This represents a major step forward for industrial materials, as previous approaches relied on optical measurement after the coating had been deposited. Because this coating system is capable of implementing a plasma close to the granular substrate, it opens the door to new surface treatment and modification possibilities.

Coating granular materials is a science in itself. A coating method based on plasma vapour deposition, called magnetron sputtering, previously only covered up to 20 mL of granular material. Now, the authors have upscaled the hardware and optimised the geometry for coating up to one litre of granular material, irrespective of particle shape or size. To do so, they use a special coating vessel designed to prevent the coating material from clumping together. Their semi-empiric model to predict the film thickness takes into account key factors such as the surface area exposed to the vapour beam or trickling behaviour, which have been approximated in the model. They found that their results were consistent with traditional thickness-measurement methods.

Applications are expected for the many granular materials used in industry, including, for example, a novel hydrogen storage system, which stores hydrogen in hollow glass spheres. Hydrogen stored in microbeads can be released by applying heat to the spheres. The new method helps meet the challenge of applying heat to the beads thanks to a chemical reaction triggered by a catalyst, which is applied to the sphere's surface.



## tna expands confectionery portfolio with acquisition of NID

Food processing and packaging equipment supplier tna has announced the acquisition of Australian confectionery equipment supplier NID. Known for its development of starch moulding equipment, NID has been supplying complete mogul lines for the confectionery industry for over 60 years.

The acquisition forms part of tna's long-term strategic expansion plan, which will move the company closer to becoming a leading single-source supplier to the confectionery industry.

Founded by entrepreneur and innovator Hans Arthur Faerber in Sydney in 1952, NID was the first company worldwide to patent the current form of tray stacking on a starch mogul. Today, more than 600 NID moguls are installed across the globe.

The acquisition will see all of NID's staff become integrated into the tna group.



## Mondelez/Cadbury is pulling out of Dunedin

In spite of investing \$80 million in its Dunedin Cadbury factory over the last 10 years, Mondelez International has announced it plans to close the factory and transfer most of its production to Australia. It is anticipated that 250 jobs will be lost this year with a further 100 going in 2018.

The Dunedin factory is located in the heart of the town and its Cadbury World is one of the region's largest tourist attractions, attracting around 110,000 visitors each year. Mondelez claims it wants to work with the local community to support Dunedin's growing sector through an investment in the Cadbury World redevelopment and will look to partner with a private operator to continue to run Cadbury World into the future.

Mondelez may contract other NZ confectionery manufacturers to make Pineapple Lumps, Jaffas and several other particularly NZ-centric products.



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## Tetra Pak stretches its mozzarella capabilities with US acquisition

Tetra Pak has acquired Johnson Industries International, a manufacturer of equipment to produce mozzarella cheese.

Johnson Industries International is one of North America's principal suppliers to the high-quality, high-volume segment of mozzarella cheese manufacturing. It also manufactures a range of cheese cutting, shredding and brining equipment.

Monica Gimre, executive vice president, processing systems at Tetra Pak, said, "Many of our customers are expanding production in this category. Thanks to this acquisition, we can now ensure they have access to a complete equipment and services solution, helping minimise the complexity of plant management."

Johnson Industries International will remain in its current location in Wisconsin, USA, and will continue to focus on its core business.



## HACCP releases pest management standard for food industry

HACCP Australia has released a new standard for pest management services for the food industry, meeting international best practice both in its development and in terms of the standard itself.

Developed by expert food technologists at HACCP Australia, together with a review committee comprising food manufacturers, retailers, auditors and pest management companies, the standard is expected to make a significant contribution to reducing food safety incidents.

Clive Withinshaw, a director of HACCP Australia said, "This is a world first. There are a number of guidelines around but guidelines are only that — guidelines. A standard allows for absolute performance measurement and can be used as a minimum criterion for food companies and pest management service providers. Companies operating HACCP programs need to give their contractors a precise set of measurable expectations and companies certified to this standard will be able to demonstrate their ability to deliver exactly that which is required.

It will be a really useful tool both here in Australia and overseas. It has been years in development and the very hard work put in by so many people will at last offer a real benefit to our industry and a reduction in food safety risk and non-conformances."

All pest management service providers that are certified by HACCP Australia will be audited against this standard, after a transition period. New applicants will be audited to the standard immediately.

The standard is available at no charge to food businesses and contractors.

## Al Dahra Agriculture acquires WA feed processor Glenvar Hay

Al Dahra Agriculture, a prominent international feed and food agribusiness player, has acquired the majority shares of Australian feed processor Glenvar Hay Pty Limited.

Glenvar Hay has been producing a variety of feed products, particularly Oaten Hay and Wheaten Straw, since 1925, and has an established sales network in Australia and across Asia and the Middle East.

The plant that the new entity Al Dahra Glenvar Hay Pty Limited will manage and operate is strategically located in Western Australia's wheat growing belt.

HE Khadim Al Darei, vice chairman and managing director of Al Dahra Holding, said the acquisition was part of Al Dahra's strategy to geographically diversify investments and establish presence in the Southern Hemisphere in order to ensure product availability across all seasons and mitigate market risks.





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## TOMRA acquires NZ's Compac

TOMRA Sorting Solutions has acquired New Zealand company Compac Holding Ltd for NZ\$70m. Compac designs, manufactures, sells and services pack house automation systems that sort fresh produce based on weight, size, shape, colour, surface blemishes and internal quality.

"With the acquisition of Compac... [TOMRA] will be the first player to present an offering to our customers for sorting fresh and processed foods with both lane and bulk sorting," said Stefan Ranstrand, TOMRA's president and CEO.

Established in 1984, Compac employs approximately 700 people in New Zealand, Australia, the US, China, South America, Spain and Italy, and occupies a leading position within the sorting of apples, kiwifruit, cherries, avocados and citrus.

TOMRA Sorting Solutions is a global provider of sensor-based sorting solutions used in the recycling, mining and food industries.

## Project trials gentle sterilisation of meat and sausage products

The short shelf life of meat and sausage products means that more than 24% of the meat products produced in Europe are lost at some stage along the value creation chain, with the majority of this loss occurring in shops and after purchase by consumers.

Contamination by zoonotic pathogens during manufacture can also present a health risk for consumers. Surface sterilisation of the packaged meat and sausage products by IR or UV radiation should increase the microbiological safety and shelf life of these products, as subsequent microbial contamination through the packaging can be ruled out.

A project funded by the AiF (German Federation of Industrial Research Associations) involving the Fraunhofer IVV and the German Institute for Food Technology (DIL) has begun to develop gentle processes for the surface sterilisation of packaged meat and sausage products.

A small pilot plant will be designed and constructed for continuous surface sterilisation with IR and UV radiation. Detailed trials will identify suitable treatment parameters for sterilising products in continuous operation in order to allow a high throughput in a short time. The effect of the different treatment parameters on key quality features such as the odour, taste, texture and colour will also be investigated, as will any effects on the properties of the different packaging materials.



© Freemages.com/Mike Fitzpatrick

## The true cost of a loaf of bread

Every 800 g loaf of wholegrain bread manufactured in the UK produces the equivalent of 0.589 kg of carbon dioxide, according to scientists who followed the manufacture of bread along the supply chain.

An analysis of the environmental impact of the steps involved in producing a loaf of bread, from growing the wheat to its delivery to the consumer, has been presented in a paper published in *Nature Plants*. The study reveals that over half of the environmental impact of this production process comes from cultivating the wheat used to make the bread loaf, with over 40% attributable to the use of ammonium nitrate fertiliser alone.

Peter Horton and colleagues from the University of Sheffield used a life-cycle assessment approach for a single wholegrain loaf of bread, looking at all aspects of its manufacture. They obtained direct data for almost all stages by collaborating with a commercial bread and flour producer and a large agronomy services provider. They then assessed six categories of environmental effects, including global warming potential, pollution of fresh water and production of toxins dangerous to human health.

The authors note that delivering high yields of high-protein bread wheat without using unsustainable amounts of fertiliser will be a significant challenge for the 21st century. However, as the environmental impact of fertiliser use is not costed within the system, there are currently no effective incentives to use it sustainably.



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## See the light.

Pilz has recently released its new range of PSEN Light Curtains which include its second generation Cat 3 & Cat 4 compliant Light Curtains. This means Pilz now has a comprehensive range of light curtains and accessories that can support a large variety of applications in any plant or factory.

Benefits of PSENOpt II at a glance;

- ▶ Come with a huge variety of functionality & programmability
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- ▶ Rapid and simple assembly, installation and commissioning



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## Data management software system

Mettler-Toledo Product Inspection has launched the ProdX 2.0 data management software system. Designed for use on food lines, as well as in pharmaceutical and chemical processing, the software package connects product inspection equipment across the entire production line into a single, unified network. In doing so, it is able to collect in-depth data about productivity and product quality issues, such as foreign body contamination, and access it in real time from one centralised location.

The system not only records the date, time, location of the reject and the reason for removal, it enables manufacturers to store verifying documentation about the active managerial control measures taken to prevent incidents reoccurring in the future. This ensures compliance with a wide range of international food standards as well as pharmaceutical and product quality guidelines.

The product is able to manage data from a wide range of product inspection machines, including X-ray systems, metal detectors, checkweighers and vision inspection equipment. It is even capable of storing X-ray and vision inspection images of rejected packs to allow further analysis of rejection incidents by operatives at a later date.

Featuring a standardised OPC Unified Architecture (OPC UA) server interface, and able to support PackML tags, the software can be seamlessly integrated into existing production line networks. This enables the software to collect data about the performance of all the inspection machines on the production line, from throughput speed to instances of product over- or under-fill, enabling the calculation of the overall equipment effectiveness (OEE) of the manufacturing process by the company's control and MES system.

The product is available as a turnkey starter pack that can be easily installed on standard-sized production lines and existing network equipment, as well as an expandable base pack that can be scaled to manufacturers' specific size and connectivity needs.

**Mettler-Toledo Ltd**

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

## Programmed maintenance

Dynapumps can provide on-site maintenance for vacuum systems to maintain equipment in good working condition.

A Job Safety Analysis (JSA) report is prepared for client approval before work commences. A standard checklist is used to ensure all items are covered during the maintenance check and a copy of the report is mailed to the user for their records.

**Dynapumps**

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





## SPX Flow helps cheese producers stop wasting the whey



Dairies around the world strive to maximise efficiencies and eliminate waste. For cheese processors, this means identifying appropriate methods for dealing with whey.

Historically, whey would be discarded by transporting it off-site to be dried by other companies, used as cattle feed or, in some cases, drained to an effluent treatment plant (ETP) or city municipality. These options would come with significant transport or disposal costs, negatively impacting the environment and operating margins.

SPX Flow has developed technologies that enable cheese processors to turn this by-product into a revenue stream by upgrading their facilities to produce whey powder, whey protein isolate powder, non-caking whey powder, non-caking permeate powder and lactose powder.

Recently, SPX Flow was awarded contracts to design and construct new plants in Lithuania to produce whey powder and non-caking permeate powder, as well as a high-yield lactose powder plant in France. This lactose plant can provide a 20% yield improvement compared to traditional processes, according to the company.

The lactose process requires specific knowledge of the heat and hold process to elongate evaporator runs, as well as key technology used in the crystallisation process. SPX Flow's process delivers consistently high-quality, white-colour, free-flowing and heat-stable powders. It offers the opportunity to produce a larger output from a single process plant, resulting in operating margin improvements.

**SPX Flow Inc**  
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# Stainless steel cylinders

*Tony Randall*

## and automating meat processing



**SMC's Head of OEM & Key Accounts Australia and New Zealand, Tony Randall, looks at how stainless steel cylinders can be used with confidence in the meat processing industry.**

**“T**he meat, poultry and seafood market faces many challenges when it comes to process automation,” commented Randall. “Not only is it notoriously an industry which requires rigorous cleaning and you always have the water factor to consider, it is also an industry which needs robust solutions to handle the working environment.”

Furthermore, Randall comments on the huge effects of productivity losses in this industry, which has very high hygiene standards, and the accompanying loss of turnover when a breakdown on the production line occurs.

According to Randall, the SMC's CG5-S and CJ5-S series of stainless steel cylinders are suitable for use in food processing machinery that requires regular and intense cleaning. Both cylinder series make use of food-grade grease, which reduces the risk of contamination. The bracket surfaces that are used to mount these cylinders are electropolished to make them smoother so that the build-up of liquids and foreign matter can be prevented.

“An increased customer demand for products which meet not only the high hygienic standards of the food industry, but is also maintenance-free and robust, has long been coming in the industry,” added Randall.

The series CG5-S stainless steel cylinder is available in eight bore sizes, from 20 up to 100 mm, and has design

features such as plugs for unused mounting threads (to prevent residue build-up in the threads) and the use of stainless steel (SUS304) on external metal parts to provide improved corrosion resistance in environments with exposure to water.

The series CJ5-S is the small bore version, available in 10 and 16 mm bore sizes, and is designed for use in environments with water spray (such as food processing machines). Both cylinders have a scraper that has been specifically designed to prevent water from entering the cylinder, which can increase the service life by up to five times when compared to conventional cylinders.

The service life of both the CG5-S and CJ5-S cylinders can be extended as they are designed to be easily disassembled to allow for the replacement of seals.

By providing quality products which are designed to meet strict health and safety standards, corrosion resistant and able to reduce maintenance and replacement costs, SMC continues to be recognised as a global technology leader in industrial automation.

“The stainless steel range of cylinders from SMC will outlast and outperform any conventional pneumatic cylinder in these conditions,” concluded Randall.



**SMC Australia | New Zealand**  
[www.smcworld.com](http://www.smcworld.com)



## Turbidity sensor

With advanced optical infrared (IR) sensing and intelligent electronics, the Triton TR6 turbidity sensor from Electro-Chemical Devices (ECD) measures turbidity or suspended solids and can be combined with ECD's 2-channel C22 analyser to monitor pH, ORP, DO, conductivity, plon and more.

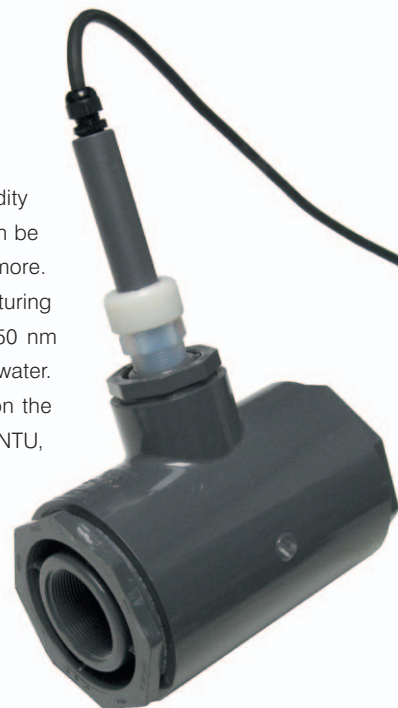
The sensor measures turbidity or suspended solids in four selectable dual ranges, featuring preset low and high ranges from 0 to 4000 NTU. Its optical IR sensor emits a beam of 850 nm (near-infrared light) into a water sample, where it is scattered by particles suspended in the water. It provides turbidity measurement in mg/L, ppm and per cent solids to volume depending on the size, shape and composition of the suspended solids in the water. Turbidity measurements (NTU, FNU) are calibrated to the specific user application environment with standards such as Formazin, StablCal or SDVB beads.

The sensor is temperature compensated to achieve accuracy of up to 2% of reading or 5 NTU (whichever is larger), features a drift rate of less than 1% per month and operates at pressures up to 50 psi. The sensor body is constructed with stainless steel (AISI 316 Ti) and rugged epoxy. The process connection is a 1" NPT nylon fitting and features an optional waterproof cable. It can be installed in either an inline flow cell or a submersible configuration up to 500 m in depth.

Featuring a choice of either side- or axially front-mounted optics, the sensor addresses the fact that external reflective surfaces in the emitted light's range can distort readings

**AMS Instrumentation & Calibration Pty Ltd**

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## Oxygen analyser

The Michell Instruments XZR400 oxygen analyser is designed to measure trace levels of oxygen in pure, inert gases such as nitrogen, argon, helium and carbon dioxide.

Capable of detecting oxygen down to 0.01 ppm, the analyser is used to ensure the purity of gas produced by cryogenic air separation.

The product uses a MSRS zirconium oxide oxygen sensor, which contains a metallic sealed reference and ensures long-term repeatability of measurements. The MSRS means that no reference air is required. The technology is non-depleting, which gives the sensors a long life span of over seven years. Calibration is required every three to six months and can be carried out with just one calibration gas, saving time and money.

The range features four configurations: rack, wall, bench mount and transportable. All models include an intuitive touch-screen interface for quick and easy operation, barometric pressure and digital flow meters. One or two 4–20 mA outputs are available and other options include digital outputs such as Modbus RTU over RS485 protocol, RS232, internal or external sample pumps and process pressure correction.

**AMS Instrumentation & Calibration Pty Ltd**

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SALMONELLA  
SACCHAROMYCES CEREVISIAE  
MRSA, C.DIFF(SPORE FORM) AND NOROVIRUS





## Large siphon-fed spray nozzle

Exair's ½" Siphon Fed Atomizing Spray Nozzle atomises a variety of fluids in a round spray pattern where no liquid pressure is available and heavy application of liquid is needed. The corrosion-resistant type 303SS nozzle draws liquid into the airstream and mixes it internally while providing up to 610 mm of suction height. Liquid can be adjusted to meet the needs of the application using the adjustment valve.

The ½" spray nozzle provides high liquid flow up to 228 L/h in a 152 mm diameter round pattern. It is also available in a No Drip version to conserve liquids.

The nozzles are suitable to coat, cool, treat and paint a variety of products using compressed air and liquids with a viscosity of up to 300 cP. Used with water, atomising nozzles are an efficient way to evenly cool hot items in an automated process. They are also suitable to use with light oils, rust inhibitors, chemicals, paints and dyes.

The nozzles are made of stainless steel for durability and corrosion resistance. All models are adjustable and have a mounting bracket available.

**Compressed Air Australia Pty Ltd**

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

## Pneumatic part ordering app

IMI Precision Engineering has launched an app to assist customers to access pneumatic components. The IMI Norgren Express App provides maintenance engineers with an ordering system which enables them to find and order products on their smartphone from a catalogue of over 100,000 part numbers. It also offers the ability to convert pneumatic parts from other competitor brands.

Utilising real-time information and user location finder, the app provides a 'buy it now' option or can locate the nearest distributor with the product in stock. Using QR code technology, engineers can scan the product code to quickly receive real-time information regarding availability, price and technical data.

Alternatively, for any product that is not in the database, engineers can photograph the part number or the product and send it to the app's technical team, which will identify the product and nearest stockist and provide the user with a response within 30 min.

The app is available from the App Store or Google Play.

**IMI Precision Engineering**

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## Dust suppression nozzle

Tecpro's CAY Cluster Nozzles for dust suppression have seven orifices in the one unit so they produce a finer spray than conventional full-cone nozzles with only one orifice. Each nozzle contains a swirl generator that spreads the water droplets in a wide, circular spray of 130° to produce a large cloud of fine mist powered by hydraulic pressure only.

The seven orifices operate under the same pressure and use the same amount of water as a single orifice nozzle, making the nozzle efficient and economical.

The nozzles are easy to install and contain an in-built filter to minimise clogging. They are suitable for use at waste transfer, materials handling and recycling stations or to suppress dust along conveyors and at transfer points.

Their low profile and availability in brass makes the nozzles suitable for fire suppression applications where the aesthetics of the nozzles are important.

For applications such as gas scrubbing and wastewater evaporation or for marine applications, the nozzles are available in AISI 316 stainless steel. For other applications, the nozzles are available in AISI 303 stainless steel.

**Tecpro Australia**

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

## Enclosures for explosive environments

The RS Pro range of painted die-cast aluminium enclosures has been designed for use where there is a potentially explosive atmosphere. Offering ATEX and IECEx certification, the series has been built to provide a high-quality yet cost-effective protective option for equipment deployed in hazardous environments.

Targeting maintenance engineers, panel builders and electricians, the extended RS Pro range of enclosures meets the rigorous demands of a variety of industrial sectors such as plant maintenance, marine and offshore, food and beverage, utilities, robotics, defence and transportation.

In addition to ATEX and IECEx certification, mandatory for equipment deployed in environments where there is a high risk of explosions, the range meets the IK09 impact rating and comes with a series of waterproof standards up to IP68.

Constructed from AISi12 aluminium material, the series features a grey powder-coated finish, stainless steel captive-lid screws and availability in a wide range of sizes. Other features include a service temperature range from -50 to +135°C and respective internal and external earthing areas of 4 to 120 mm<sup>2</sup>. The series also meets further approval standards, including cULus, CE, RoHS and GOST-R.

**RS Components Pty Ltd**

[au.rs-online.com](http://au.rs-online.com)



## Rotary piston pumps

Rotary piston vacuum pumps are most commonly used in heavy-duty industrial applications. They are traditionally oil-sealed and tolerant of ingress of contaminated gases.

The Dynapumps range can achieve flow rates of up to 3000 m<sup>3</sup>/h, with vacuum of 10<sup>-3</sup> mbar. Rotary piston pumps are differentiated by their heavy-duty design and construction and as such are suitable in many manufacturing industries.

**Dynapumps**

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



## Upgraded standardisation unit

Tetra Pak has released an updated version of its Standardisation Unit with improved precision, to help dairy manufacturers produce their products with optimal fat content and achieve savings.

To produce milk with a specific percentage of fat content, an important step in dairy production is to separate fat from milk. Fat is then added back to the product according to the required specification through a process called standardisation.

Designed for automatic in-line standardisation, the unit enables manufacturers to reduce the variation of so-called 'cream giveaway' from the previous ±0.020% to ±0.015%.

The unit is suitable for a wide variety of dairy products, including white milk, cheese milk, milk powder, fortified milk and flavoured milk, at a capacity of up to 75,000 L/h.

**Tetra Pak Marketing Pty Ltd**

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## Safety light barriers

The Schmersal SLB series safety light barriers have small dimensions and built-in analysis. The range includes SLB 240 (Type 2), SLB 440 (Type 4) and SLB 450 (Type 4).

Standard features include an integrated safety monitoring module, automatic start or restart interlock, Safe OSSD outputs, integrated visual indication, 4-stage optical coding for multiple units in close proximity, prewired or M12 connectors and IP67. It has a range up to 15 m with the SLB 240/440 and up to 75 m for the SLB 450.

An optional electric heater is available on the SLB 450 to offer frost-free operation in low temperature applications down to -30°C. It is suitable for applications that require protection of equipment within cool rooms, freezers and outdoor applications.

The range can be used on all equipment where a narrow protective height is required and/or the equipment length is long. Example industries include paper and printing, timber processing, mining, packaging and warehousing.

**Control Logic Pty Ltd**

[www.control-logic.com.au](http://www.control-logic.com.au)

## Open board digital temperature controllers

Oven Industries' 5R7-570(A) RoHS-compliant open board electronic temperature controllers are designed with a proportional integral control algorithm to provide precise control to thermoelectric modules (Peltier) at an economical price.

The H-bridge temperature control provides a seamless transition between heating and cooling, eliminating dead spots. Green LED for heat and blue LED for cooling indicate mode and simultaneous illumination indicates the load circuit is off due to an open sensor. Pulse width modulation controls the power level in the thermoelectric module at a base frequency of 1 kHz. Power resolution is one of  $\pm 250$  steps in the load circuit control. This small package temperature controller measures 1.75 x 3.5 x 3" with input voltage 6–28 VDC, output voltage 0–36 VDC, load current 0.1 to 12.5 A, 450 W output power control, control stability  $\pm 0.1^\circ\text{C}$  and temperature range of -20 to 150°C.

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## Industrial cameras

Ximea XiQ USB 3 industrial cameras are compact, measuring 26.4 x 26.4 x 21.2 mm and weighing 27 g. Performance is claimed to be four times faster than GigE, five times faster than Firewire and 10 times faster than USB 2.0 for machine vision applications. They are suitable for a range of applications, including industrial, manufacturing and factory automation, robotics, food and print inspection, face recognition, automotive crash testing and rapid process capturing.

With a CMOS global shutter, the cameras offer fast, high-speed, high frame rates: 500 fps at VGA; 90 fps at 4 MP (2048 x 2048) and 170 fps at 2 MP resolutions. They are compatible with more than 30 vision libraries, Windows, Linux, Mac OSX, ARM and the USB3 Vision Standard. Colour and monochrome versions are available.

**SciTech Pty Ltd**

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

## Side channel blower

The Dynapumps side channel blower has flows from 50–2500 m<sup>3</sup>/h and pressures up to 1000 mbar.

Applications which require positive pressure air and suction and can be handled by side channel blowers include conveying gases and/or vapours in chemical processes, in food processes and the beverage industry; pneumatic conveying powders, grains, granules and fluid materials; packaging and labelling machinery etc.

The side channel blower principle allows oil-less and contactless compression of pumped gases. This provides a low-maintenance, contaminant-free pumping environment. It is a low noise level alternative to PD blowers.

For more information: <http://www.dynapumps.com.au/productlisting/vacuum-air/by-industry/food-processing/side-channel-blower.aspx>.

**Dynapumps**

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## Dematic AGVs



With forklift operating costs in Australia among the highest in the world, Dematic's range of Automated Guided Vehicles (AGVs) offer manufacturers and distributors the opportunity to significantly reduce materials handling operating costs and virtually eliminate the potential for workplace incidents involving conventional pallet trucks, forklifts and reach trucks. Dematic announced it had acquired NDC Automation in 2016 adding further to its comprehensive range of integrated logistics and supply chain automation

solutions for food manufacturers.

Single or double pallets of stock and a wide range of production materials can be handled and transported safely and accurately around the clock by driverless AGVs in manufacturing and distribution centre (DC) environments. Benefits include significantly reduced labour costs and damage to storage equipment and stock, together with improved supply chain reliability and traceability. For businesses running multiple shifts, the return on investment is rapid.

Dematic manufactures a comprehensive range of AGVs including forklifts, unit load, very narrow aisle (VNA) and specialty vehicles to reliably move materials, stock and finished goods through DCs and production environments in a timely, cost-effective, safe and flexible way.

Dematic AGVs are suitable for unit load handling in sectors such as cold storage, food and beverage distribution, fast moving consumer goods, grocery retailing, third-party logistics and a variety of manufacturing operations.

Suitable applications for AGVs include:

- Multi-shift pallet handling operations, in which payback can be as little as two years
- Where loads need to be transported over long distances
- For storage systems up to 10.7m high, with special masts available for even higher applications
- Operations requiring a consistent, reliable flow of goods
- In process automation applications
- Transporting, sorting and staging loads for despatch

- As a consistent, reliable interface to Automated Storage & Retrieval Systems (ASRS)
- End-of-production line palletising
- When the use of conventional forklifts is not appropriate
- Where AGVs contribute to a safer working environment

Dematic AGVs are available in a wide range of configurations and capacities, and are available with a variety of battery and charging options including automated battery changing systems and opportunity charging during operation to optimise battery life between charging cycles.

Customisable safety features including auto-stop proximity sensors eliminate the potential for collisions with equipment or personnel, ensuring workplace safety in even the busiest of operations.

The Dematic AGV Pallet Management System (PMS) runs on a Windows PC over a standard wireless network, assuring low costs and easy integration to any Warehouse Management System (WMS).

The AGV PMS controls the flow of product from production to storage to despatch, automatically tracking all product movements, providing accurate and up to date data at any time. The system also interfaces directly with associated production and materials handling systems including robotic palletisers, conveyors and automated truck loading systems.

With an installed base of more than 500 AGVs across over 110 sites in Australia, Dematic is the leading manufacturer and supplier of AGVs in the country. Globally, 80 partner organisations use Dematic's AGV technology with more than 11,000 AGVs supplied to 1,400 companies.

As the competitiveness of food manufacturing and order fulfilment grows, it is vital that businesses look at ways to optimise their supply chain and differentiate themselves from the competition. AGVs could be a cost-effective solution to transform the accuracy, efficiency and reliability of your logistics operations and deliver your business a lasting competitive advantage.

Dematic Pty Ltd.  
(02) 9486 5555  
[www.dematic.com.au](http://www.dematic.com.au)

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We Optimise Your Supply Chain



# Apples ain't necessarily apples

## Travels with apples and spy apples

Cornelia Zogg



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On the long journey from the fruit plantation to the retailer's shelf, fruits can quickly perish. In particular, the refrigeration inside the cargo containers is not always guaranteed and existing methods for measuring the temperature are not sufficiently reliable. A sensor developed at Empa in Switzerland solves this problem. It looks like a piece of fruit and acts like a piece of fruit — but is actually a spy.

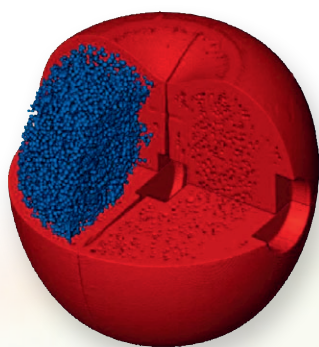
**M**angoes, bananas and oranges have usually travelled long distances by the time they reach our shops. They are picked, packaged, refrigerated, packed in refrigerated containers, shipped, stored and finally laid out on display. However, not all the cargo makes it safely to its destination.

Although fruit is inspected regularly, some of it is damaged or may even perish during the journey. This is because monitoring still has significant scope for improvement. Although sensors measure the air temperature in the freight container, it is the core temperature of the individual fruit that is decisive for the quality of the fruit.

However, up to now, it has only been possible to measure this 'invasively', for instance by inserting a sensor through the skin and into the centre. And even this process has drawbacks. To carry out the measurement, the technician usually

takes a piece of fruit from a cardboard box in the front row of pallets in the container, which in turn distorts the result. Fruit that is closer to the outside of the transport container is better refrigerated than fruit on the inside.

Sometimes whole container loads have to be destroyed because the temperatures on the inside of the container did not meet the prescribed guidelines. The USA and China, in particular, are extremely strict regarding the importation of fruit and vegetables. If the cargo has not been stored for three weeks at a certain minimum temperature, it is not authorised for sale in the country. Not only does refrigeration serve to maintain the freshness and quality of the fruit, it also kills any larvae, such as moth larvae, which can nest in the fruit. It is therefore essential to prove that the refrigeration has actually penetrated all the fruit in the whole consignment for the required period of time.



*Schematic of the spy apple sensor.*



*The braeburn version of Empa's artificial fruit sensor.*



*Up to now, a fruit had to be sliced up and a sensor placed inside. The 'spy fruit' is then stuck back. However, this distorts the results as the fruit is damaged.*

### The sensor travels with the fruit

In order to guarantee and monitor the temperature within the fruit, researchers at Empa have now developed an artificial fruit sensor. It is the same shape and size as the relevant fruit and also simulates its composition, and can be packed in with the real fruit and travel with it. On arrival at the destination, the data from the sensor can be analysed relatively quickly and easily. From this, the researchers hope to gain information about the temperature during transportation.

This is important information, primarily for insurance reasons: if a delivery does not meet the quality requirements, the sensor can be used to establish the point in the storage and transport chain at which something went wrong. Initial results are certainly very promising: "We analysed the sensors in the Empa refrigeration chamber in detail and all the tests were successful," explained project leader Thijs Defraeye from the Laboratory for Multiscale Studies in Building Physics. Field tests are currently underway at Agroscope in Wädenswil.

### An artificial fruit sensor for Braeburn and Jonagold apples

The same sensor does not work for all fruits, as Defraeye explained. "We are developing separate sensors for each type of fruit, and even for different varieties.

"There are currently separate sensors for the Braeburn and Jonagold apple varieties, the Kent mango, oranges and the classic Cavendish banana. In order to simulate the characteristics of the individual types of fruit, the fruit is X-rayed, and a computer algorithm creates the average shape and texture of the fruit. From the literature or based on their own measurements, the researchers then determine the exact composition of the fruit's flesh (usually a combination of water, air and sugar) and simulate this in exactly the same ratio in the laboratory, although not with the original ingredients, instead using a mixture of water, carbohydrates and polystyrene.

"This mixture is used to fill the fruit-shaped sensor mould. The mould is produced on a 3D printer. The researchers place the actual sensor inside the artificial fruit, where it records the data, including the core temperature of the fruit. Existing measuring devices on container walls only provide the air temperature, but this is not sufficiently reliable because the fruit can still be too warm on the inside. Although such fruit core simulators already exist in the field of research, they are not yet sufficiently accurate," explained Defraeye.

One such example that has been used is balls filled with water with a sensor inside. "We have conducted comparative tests," said the researcher. "And our filling provided much more accurate data and simulated the behaviour of a real piece of fruit much more reliably at different temperatures."

### Not (yet) wireless

Initial field tests on the sensors are currently underway and the researchers are now looking for potential industrial partners to manufacture the fruit spies. The investment is certainly likely to be worthwhile. It is estimated that the cost of such a sensor is less than 50 Swiss Francs. The data would only have to be analysed if something was wrong with the delivered goods. This would then make it possible to efficiently establish where in the process an error had occurred.

Another desirable feature would be to be able to receive the data from the cargo container live and in real time, so that appropriate countermeasures could be taken in the event of abnormal data — thereby potentially saving the fruit cargo. That would require a wireless or Bluetooth connection. "However, our current fruit sensor cannot do that yet. And the price of the product would, of course, go up," said Defraeye. But the profits for the companies would probably also go up if the fruit sensors enabled them to supply more goods in perfect condition.

The project was funded by the Commission for Technology and Innovation (CTI).





## Electric forklift trucks

Mitsubishi's FB-TCB series 3-wheel electric forklift trucks provide clean and robust power for the logistics and warehousing industries.

The FB13-20TCB has an ultracompact design and excellent manoeuvrability, making it suitable for confined working areas such as narrow warehouse aisles and containers. The forklift is equipped with a 48 V battery, efficient AC Power traction and hydraulic motors and regenerative systems.

All forklift trucks in the series are equipped with the AC Power control system which integrates travel, hydraulic and electric power steering functions.

The trucks are suitable for indoor applications where noise, pollutants or particulate contamination are undesirable. They also 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.

Electric power steering, good visibility, ergonomic controls, comfortable seat and leg room enhance operator comfort, while safety is improved by integrated speed control on slopes. On an upslope, if the accelerator or brake pedal is released, the truck will only roll backwards at a speed of less than 1 km/h.

A digital load indicator enables operators to quickly tell the weight of the load. When overloaded, the truck will warn the operator through the display and by a warning buzzer.

**MLA Holdings Pty Ltd**  
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## Safety light curtain

Leuze electronic has introduced the MLC 530 SPG (Smart Process Gating) safety light curtain.

The Smart Process Gating uses a control signal provided by the PLC and the interruption of the protective field as a trigger for bridging to the transport material. A fault-free passage is therefore guaranteed and reduces the risk of tampering by operating personnel. A reference beam remains active for monitoring.

The safety light curtain saves the cost of muting sensors, their installation and their maintenance. This in turn saves space and provides high security against manipulation.

The safety light curtain can be used in two operating modes for speeds of up to 0.2 m/s or speeds up to 0.6 m/s depending on application (production line or conveyor line).

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## Stretch hood machine

Qimarox has added a standard stretch hood machine to its range of material handling components. The Qimarox Highrunner mk7 is a modular, serially produced palletising module which can swiftly stack final packages of various shapes and sizes on pallets.

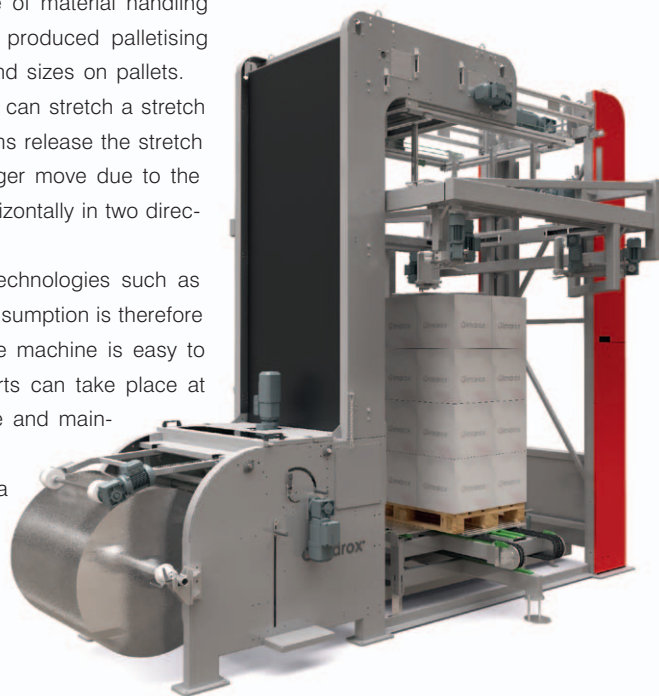
The compact stretch hood machine has four tensioning arms that can stretch a stretch wrap taut and pull it over the loaded pallet. When the tensioning arms release the stretch hood, the boxes, bags or other products on the pallet can no longer move due to the elasticity of the film. Because the four tensioning arms can move horizontally in two directions, the stretch wrapper can wrap any size of pallet.

What makes the machine different is its lack of power-hungry technologies such as pneumatics and hydraulics to power the tensioning arms. Energy consumption is therefore minimised, allowing users to save on energy costs. In addition, the machine is easy to maintain. Inspection of the machine or replacement of wearing parts can take place at ground level, so moving machine parts are not required for service and maintenance work.

The stretch hood machine is supplied to system partners without a control system, offering the opportunity to combine the control system of the machine with that of the other end-of-line packaging system components. This provides better integration, as well as simpler control and lower investment and maintenance costs.

**Qimarox**

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### Sanitary high-lift box tipper with vibratory bin feeder

The Flexicon TIP-TITE bulk transfer system can be used to move material from boxes into a mobile bin with vibratory feeder that services multiple downstream processes.

The stainless steel construction allows handling of corrosive materials and/or washdown between runs of contamination-sensitive food, nutraceutical, pharmaceutical and chemical products. Castors mounted at the base of the bin allow it to be rolled away from processing areas for a complete washdown.

Boxes measuring 915 to 1220 mm per side and 990 to 1117 mm in height are loaded at floor level and raised hydraulically to sit against a discharge hood. The assembly is then hydraulically elevated and tipped, which mates the spout of the discharge hood to a gasketed receiving ring installed on the lid of the mobile bin.

The dust-tight connection allows the opening of a pneumatically actuated slide gate and discharging of material into the bin with no contamination of the product or plant environment, while permitting partially empty boxes to be returned to the plant floor with no dusting.

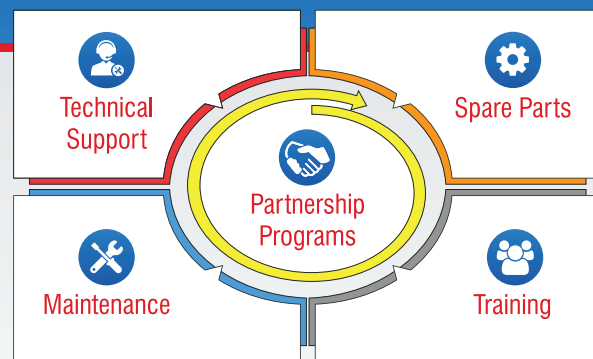
Once the bin is rolled or forklifted to a downstream process, material flows through a pneumatically actuated slide gate into a vibratory feeder equipped with eccentric weights for gentle, volumetric metering.

Separate control systems — housed in NEMA 4 or NEMA 4X enclosures for washdown using steam, cleaning solutions and high-pressure water — provide manual or automated control of all hydraulic, pneumatic and electrical functions.

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# Have you had your magnets checked lately?



**Attention to product purity on the production line has never been greater, creating the need for manufacturers to detect and eliminate foreign objects and ferrous metals such as rust, nails, scale, work-hardened stainless and bolts before the end product reaches customers. Eliminating metal contamination also prevents damage to expensive processing machinery, reducing downtime and repair costs.**

**M**any manufacturers today proactively invest thousands, if not millions, of dollars into magnetic separation and metal detection equipment, to reduce the risk that any foreign object or contaminant will be mixed in with their product and sold to their network of customers.

Permanent magnetic separators can be used to draw out fine tramp metal along critical points of the production line. These separators come in different styles and in various magnetic strengths, depending upon the application. However, periodically, they should all be tested to confirm their strength and to ensure compliance with current international food safety standards.

Eriez conducts magnet audits for food manufacturing companies across Australia, using procedures and documentation recommended by HACCP International. Certifications can be provided that give producers the documentation necessary to demonstrate their efforts to maintain product purity.

Eriez offers magnet pull tests and application inspection. On completion, the company's technicians will provide a report which includes a validated test certificate. Even if

it is not an Eriez product, Eriez specialists will audit any magnetic separation equipment, evaluate its effectiveness and offer recommendations that could improve the separation performance. The physical condition of the magnet, access and any safety concerns will also be checked.

Eriez specialists will also test the magnet's strength and, if possible, compare to previous audits or OEM specifications to confirm it is still as strong as when first installed. More importantly, Eriez can provide recommendations and advice regarding food safety industry standards. Pull tests are an essential quality control tool used to monitor magnet strength to ensure optimum performance.

It is necessary to develop, implement and maintain an effective magnet auditing program. Regular magnet tests will help you maintain your magnetic separator's performance and provide documentation which demonstrates your efforts towards improved product purity. This due diligence ensures that your product will comply with HACCP International Food Safety Standards.



**Eriez Magnetics Pty Ltd**  
<http://en-au.eriez.com>



## Antistatic ion air cannon

Exair's Ion Air Cannon eliminates static electricity and cleans at distances up to 4.6 m, with no moving parts. It is suitable for benchtops, machine mounting and hard-to-reach spaces that require a concentrated flow of static-eliminating ions.

The product is CE, UL and RoHS compliant, and its design features include a metal-armoured high-voltage cable to protect against abrasion and cuts, a replaceable emitter point, integrated ground connection and electromagnetic shielding.

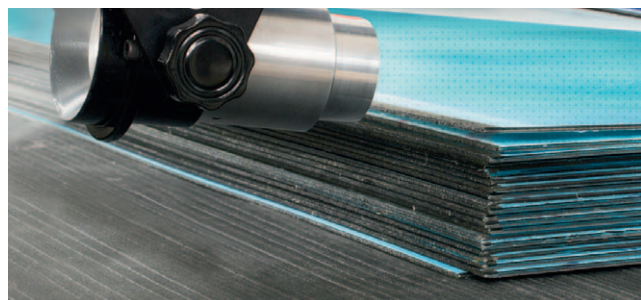
The cannon incorporates Exair's Super Air Amplifier that minimises compressed air use by inducing surrounding airflow at a ratio of 22:1. The amplified airflow carries the ions to the target, making it possible for the cannon to eliminate static charges in less than a half second. Air volume and velocity are controllable from a 'breeze' to a 'blast' to gently wipe or forcefully blow away contaminants.

Available from Compressed Air Australia, the cannon comes complete with a sturdy stand that incorporates a swivel adjustment for directing the airflow. A hose or tube can be connected to the air intake to draw air from another area. The electrical ion source is shockless and there is no radioactive element. A selectable voltage power supply has been designed to operate the cannon.

Applications include bag opening, sheet separation, cleaning moulded parts, pre-paint dust removal, package cleaning and container neutralisation.

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# The importance of supply chain monitoring in the food and drink industry

George Hall

By now the repercussions of the 2013 horsemeat scandal have surely been felt by all in the food and drink industry. Any lessons learned have been cascaded throughout the supply chain, with more stringent supplier and certification body auditing having been underway for some time now.

Unannounced audits are now commonplace, with the BRC and larger supermarket chains making these part of their terms of working and simply expecting their suppliers to comply. Would this level of scrutiny have been part and parcel of the industry had the horsemeat scandal not come to light? I'm not too sure. But despite the extra pressures placed on all businesses, I do feel the steps are correct and required.

Knowing where something has come from is paramount in all aspects of life, not just commerce or industry. Some people are willing to look the other way for a good deal, such as the 'off the back of a lorry' transactions that go ahead. Others, though, demand further information on where an item originated from and where it passed through the supply chain.

A lot of this tracking of information relies on suppliers. To ensure the information provided is correct, that they meet a specified code of conduct and certain standards, such as BRC or ISO 22000, can require a lot of time and effort within an audit process. Spreadsheets — full of fancy colours and manual reminders — are most often the format of choice for ensuring suppliers are checked on time and often.


However, as with any manual process, this comes with its own risk, such as target dates being missed or simply being overlooked as it relies most often on a visual assessment of the data contained within. Then, as the audit process moves forward there is a lot of preparation time required to pull together data from the last visit, any standards they are expected to meet along with any assessment questions set by the customer themselves. Even once on-site, it can be difficult to carry everything that is required around, which quite often results in many audit reports and results being written or typed up back at a hotel after the working day has finished. Looking back at scribbled notes and trying to decipher just what it is you actually wrote after a long day is never a good way to ensure accurate information is captured.

Similarly, any issues you may have with a supplier often results in many days' worth of emailing and calling to ensure any corrective actions have been applied and further control

measures implemented to prevent any recurrence. The reliance on manual reminders here can have serious repercussions should a target date be missed, which could, in a worst-case scenario, result in the delayed shipment of a product to a customer.

Some would argue the extra time and effort being put into supply chain monitoring is warranted, and to some extent I agree. No business out there wants to be the next major supplier to have the world's media pointing lenses and microphones at them while demanding answers or, perhaps more importantly, losing the trust of their long-term customers and the potential losses this could lead to!

I am also certain that everyone reading this monitors their supply chain to the best of their abilities and in line with all company requirements. However, in the spirit of risk management, let us consider a worst-case scenario in that something like this may happen to your organisation.

Are the processes and systems you have in place going to allow you to respond to whatever arises in a quick and effective manner? 

*George Hall, Product Consultant for Ideagen, has worked in the safety, quality and risk management software industry for over seven years and has over 12 years' experience in customer account management. During this time, George has built up an understanding of the common business pains and the operational needs of our customers and new business prospects. Day-to-day engagement with Ideagen's clients and providing comprehensive product overviews are a major part of George's role. Ideagen is a supplier of information management software and specialises in eGRC (Enterprise Governance, Risk and Compliance) and Healthcare solutions for organisations operating within highly regulated industries. With an excellent portfolio of software products, Ideagen is able to provide complete content lifecycle solutions that enable organisations to meet their Regulatory and Quality Compliance standards, helping them to reduce costs and improve efficiency.*





## Protective floor coatings

3M floor coatings employ chemical technologies to protect floors and maintain a new look. The hybrid technology in Scotch-Gard Floor Protector products densifies surfaces, increases hardness and improves wear.

The coating produces a glossy, hard surface that is dust-repellent, chemical-resistant and watertight. Its powerful, water-based formula means no stripping or deep scrubbing is required, eliminating operator exposure to and environmental release of potentially hazardous stripping chemicals.

The floor protector is available in options designed for stone surfaces like concrete marble, terrazzo and other porous surfaces, and resilient surfaces like vinyl, vinyl composition (VCT) and solid vinyl tile (SVT).

The products also improve the dry slip resistance of application substrates, improving the safety compliance of floors, according to the company.

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# Wiley gets Haverick Meats back on track after devastating fire

After fire devastated the Sydney factory of Haverick Meats in May 2016, it took a team effort to get the facility back open, supplying the professional foodservice industry and the community, in time for the Christmas rush.

"It wasn't until I got here that I saw how serious it was and we had about 15 fire trucks, 75 firefighters, helicopter in the air, water going, engineers and mobile officers everywhere," recalled Peter Andrews, CEO of Haverick Meats.

To help with their disaster recovery needs, Haverick Meats called on design build food facility specialists Wiley, with whom they have a longstanding relationship and shared values, both being family owned and operated businesses.

Wiley staff were on-site within two days of the fire with an aim to have Haverick Meats at full operating capacity by the end of November using their rapid rebuild recovery system. The process began with Wiley collaborating with the insurance company to find the best possible solution for the parties. Wiley utilised the design build model to start works on-site as early as possible and save weeks on contract time. The model also provided an opportunity for contribution from all stakeholders involved on the project.

"We had the same footprint as what we had before but it's been redesigned and reengineered to improve. The improvements that Wiley made benefit our ability to service our customers even better than before," explained Andrews.

Wiley Managing Director Tom Wiley said, "We understood the importance for Haverick Meats to be operational by December to ensure they could cater for the increase in production their factory sees during that time. Collaboration with Haverick Meats and the insurance company was key to delivering this project as fast as possible and in the best way. We were honoured to be able to support Haverick Meats through such a challenging and emotionally draining experience."

Andrews continued: "It's a great big relief to be back in the facility. To finally see it built is quite amazing. It was important to us to be up and running as quick as possible. It was all high pressure, as a business we continue to grow. Lucky for us Wiley told me 30th November was the delivery date and they got me in two weeks earlier, which was quite impressive."



"We put our heads together to say is there anything there that may need an improvement which can take the business and improve it for years to come? Together we have taken the facility and it's gone to the next level."

The new facility is home to the latest in cutting-edge technology, featuring upgraded machinery and equipment. New advanced automation has been installed, ensuring consistent cutting precision and portion control. It also features a temperature and humidity controlled dry-ageing room that offers expertly monitored dry-aged beef at the peak of its flavour.

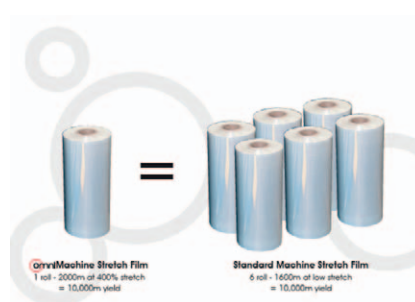
**Wiley & Co Pty Ltd**  
[www.wiley.com.au](http://www.wiley.com.au)

## Pallet wrapping solution

AAA Packaging Supplies has released a pallet wrapping solution that is claimed to reduce stretch film usage by over 50%.

The Omni Pallet Wrappers and Omni Stretch have been engineered together to maximise film usage efficiently. Using nanotechnology, the multilayer Omni Stretch Films are thinner, stronger and longer, allowing users to wrap more pallets with less film. Through cutting-edge resin advancements, Omni has developed high-performance films that are less than half the micron of conventional films with high puncture resistance and load containment. Used in conjunction with the Omni wrappers power-pre-stretch technology, these films have a stretch yield over 400%.

**AAA Packaging Supplies**  
[www.aaapackaging.com.au](http://www.aaapackaging.com.au)







## White paper on HACCP and flooring

Implementing an effective hazard analysis and critical control point (HACCP) food safety management system is a central priority for today's food and beverage producers, as it is critical to complying with the standards of domestic and international regulatory authorities, governments and consumers.

Flowcrete Australia has produced a white paper titled 'What is a HACCP Food Safety Management System and How Does it Relate to Flooring?' to help food and beverage businesses learn about this preventive risk assessment tool and ensure that all facilities comply with its guidelines.

The white paper explores HACCP-compliant flooring materials and provides recommendations on flooring systems suitable for today's demanding food industry. Readers will be able to find out what flooring characteristics and certifications they need to look out for in order to ensure that floors within production, processing and storage areas live up to the HACCP standard.

The white paper also examines how HACCP came to be created, the role it plays in Australia's regulations and the product certification scheme HACCP International, which evaluates materials, equipment and services used within the food industry.

The white paper is free to download.

**Flowcrete Australia**  
[www.flowcrete.com](http://www.flowcrete.com)

## Ring guides and ring segments

The HepcoMotion Precision Ring and Track System PRT2 allows complete 360° or segmental motion and guidance. All elements in the range of precision ring guides and ring segments are available in stainless steel materials, allowing for use in the food industry. Special food lubricants and high-temperature greases are also available. The range offers an alternative to slewing rings.

The rings are used to produce turntable movements for indexing parts for assembly or in applications such as fitting caps to bottles, which require the turntable to be indexed to an accurate position each time to enable the cap to be pressed in position. A servo-driven PRT2 single-edge V-ring with an integral gear provides the positional accuracy and speed of response to ensure high-speed throughput. In this design, the driving pinion is positioned on the internal ring diameter rack, with V bearings positioned on the external diameter, ensuring control at the periphery of the ring.

Depending on the load and duty cycle of the application, up to 8 V bearings can be fitted around the ring.

Ring systems have an integrated rack and pinion drive or timing belt, negating the need for additional drive components. Movement through an arc can be achieved using ring segments. The range comprises a wide range up to 1500 mm in diameter, with high-capacity V groove bearings and simple lubrication systems.

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## Elevating spiral conveyor

Enmin's Elevating Spiral Conveyor is an Australian-made range of equipment which fulfils the need for conveying products and raw materials vertically to higher levels or, conversely, down to near ground level.

The conveyors have a comparably small footprint and their ease of cleaning and almost maintenance-free operation makes them suitable for a large variety of food production environments.

Restrictions in conveying material up an incline have been overcome by utilising the powerful acceleration of vibratory motors combined with a specially engineered spiral flight path. The result is the positive movement of material within the spiral, taking product from the feed point to the elevated discharge.

The profile of the spiral ensures no spillage during the transportation process and the totally sealed welding procedure prevents raw materials from accumulating in the spiral. The open design permits easy visual inspection and cleaning when changing ingredients and product.

The spiral conveyor has no crushing points or exposed rotating parts, which creates a safe method of conveying while keeping noise to a low level.

With all contact surfaces constructed from stainless steel, the spiral elevator is engineered to handle a wide range of tonnages and a large array of dry materials and products. Elevations of up to 7 m are available and the compact vibratory drive arrangement can be either base or overhead mounted.

Electronic controls are easily integrated with adjacent systems and the mechanical installation involves simply bolting it down once in position.

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## Bluetooth-enabled dataloggers for cold chain monitoring

Oceasoft has developed two tools to streamline the high-volume management of its Bluetooth-enabled datalogger products.

The automation tools — a Loading Bench for fast datalogger configuration and OCEABridge for automated wireless data collection — are innovations in cold-chain monitoring management for transportation and high-volume shipment, which will automate key operational processes to reduce risks and optimise the overall logistics chain.

The loading bench programs dataloggers in just 2 s wirelessly using NFC (near field communication) technology. The process includes a quick series of tests and controls as a last-minute quality control measure.

The data collection gateway uses Bluetooth Low-Energy to automatically detect all dataloggers entering its wireless range and collect recorded sensor readings and other important information.

Used in combination with the company's web-based software running on computer and mobile devices, all programmed and collected data are accessible from anywhere at any time.

**Kenelec Scientific Pty Ltd**

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



## EHEDG magnetic filter with CIP cleaning

The EHEDG magnetic filter introduced by Goudsmit Magnetics is designed for the food industry. This hygienic filter is suitable for CIP systems as the magnet can be magnetically operated, without the need to open the filter housing for cleaning.

The filter is constructed of neodymium magnets that provide effective separation of ferrous particles as small as 15  $\mu\text{m}$ , weakly magnetic particles and even iron dust from sticky substances such as chocolate, pastes, powders and fruit juices. The magnet has a maximum flux density of 11,300 gauss at the bar and removes the specified particles from both liquid and powdered products. The entire system is made of grade 316 stainless steel, is smoothly finished ( $R_a \leq 0.4 \mu\text{m}$ ) and is EHEDG certified.

Cleaning of the magnet occurs automatically. When production is stopped the magnet can be 'blown' out of the product flow so the flushing cycle can carry away the captured ferritic particles. After the flushing cycle the magnet part is ready for the complete CIP cycle. The housing is constructed so that no product remains behind after cleaning.

The magnetic filter is used in tubes and/or pipelines in the food industry, where it performs deferrisation of products conveyed under pressure. The hygienic magnetic filter is available in five standard dimensions ( $\varnothing$  50–125 mm), has a standard pipe connection and can also be delivered with a manual cleaning option which is not EHEDG certified.

**Goudsmit Magnetic Systems BV**

[www.goudsmit-magnetics.nl/](http://www.goudsmit-magnetics.nl/)

## Time for a Check Up?

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## Pneumatic weigh hopper with fill/pass valve

A weigh hopper with a fill/pass valve for dilute-phase pneumatic conveying systems has been introduced by Flexicon. Suspended from three small-scale load cells, the gain-in-weight hopper delivers higher accuracy than loss-of-weight systems requiring higher-capacity load cells.

Single or multiple hoppers can be positioned along a common vacuum or positive pressure pneumatic conveying line for discharging of dry bulk solids into single or multiple process equipment, storage vessels or downstream use points by weight. Downstream of the last fill/pass valve, the conveying line can be routed to the original material source point or into a dust collection device.

The system's controller weighs a batch by changing the position of the valve, which diverts conveyed material into the hopper. As the hopper fills, load cells transmit weight gain information to a PLC. Once the batch weight has been reached, the valve redirects material away from the hopper. The controller then actuates a slide gate valve to open, discharging the weighed batch.

Rated for the pressure differentials associated with pneumatic conveying, the conical hopper is eccentric with a vertical sidewall to promote complete discharge of weighed materials for batching accuracy.

The unit is constructed of stainless steel finished to industrial or sanitary standards to suit chemical, mineral, plastics or food processing applications.

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## Lightweight 3-in-1 handheld tablet

Panasonic has launched the Toughpad FZ-N1, a lightweight, rugged, 3-in-1 handheld tablet that combines the productivity benefits of a mobile barcode reader, phone and tablet in one device.

The 277 g tablet is designed for transportation and logistics, manufacturing and retail, and is suitable for applications such as inventory management, shipping and receiving, delivery routing and parcel tracking, and retail store queue busting.

The ergonomic angled barcode reader has been created to provide greater comfort for workers, who can scan items without bending at the elbow or wrist while also being able to clearly read the screen.

The daylight-readable display is built to withstand a 1.8 m drop on concrete and works with a wet screen or with gloves on. The device is fully sealed against dust and is submersible in 100 cm of water for 30 minutes, meeting IP65 and IP67 certification requirements, plus it can withstand temperatures from below -100 to above +50°C.

The 4.7" Android device features a Lollipop operating system and quad-core Qualcomm Snapdragon processor. It is a full multicarrier Band 28 4G LTE phone with dual SIM card support and up to 700 h standby time. It comes with 100 dB speakers with noise suppression and triple noise-cancelling microphones. The standard, field-replaceable battery provides 8 h of continuous operation.

**Panasonic Australia Pty Limited**

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



## ISO project committee aims to simplify traceability

Traceability — known as chain of custody (CoC) — is the key to establishing authenticity and, by extension, reassuring consumers of the quality and safety of the products they buy. Knowledge and tracking of specific product characteristics (origin, sustainability traits and/or manufacturing process) is increasingly important and demanded by consumers.

A reliable CoC management system is therefore important for certification and quality assurance schemes.

Commercial CoC systems and programs abound, all with their own semantics, presentation and industry focus, and include CoCs for food safety, sustainable agriculture or compliance in manufacturing. But the sheer number of such systems adds unnecessary layers of administration, thereby increasing costs and pushing smaller companies out of international markets.

A new ISO project committee — ISO/PC 308, Chain of custody — has been established, making traceability simpler for all supply chain actors by using a uniform ISO language globally.

The chair of ISO/PC 308, Rob Busink, said: “The proposed generic chain-of-custody standard will define supply chain models and the respective traceability levels and specific requirements related to administration, conversion rates and physical handling activities, thus simplifying market access by using a uniform language and criteria throughout the supply chain.

“It is hoped that existing and new certification schemes will be able to refer to the ISO standard for the terminology regarding chain-of-custody requirements, thus simplifying the conformity assessment for those various product certifications and reducing unnecessary duplication or misunderstanding.”



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# Intralogistics:

## the start of the road to the smart supply chain

Intralogistics, like logistics, is about the handling and flow of goods and materials. But with intralogistics, this takes place not on the roads, but instead within a company site.

**T**he processes include the packaging of goods in crates, wraparounds or baskets, sorting them onto pallets for the individual orders and then dispatching them. And also, the raw materials or new glass bottles have to be brought from the stores to the point of use.

Over the years this in-company flow of goods has changed from being a necessary evil into an important factor in the creation of added value in a company. Because only companies that can deliver the product fast and with flexibility, and without tying up or using capital unnecessarily, will win out against the competition.

### Ordered today, delivered tomorrow

In many applications even this is no longer enough. 'Same day delivery' is now almost a must, especially in online food retail. To achieve this, delivery chains have to be adaptable, because the markets themselves are changing all the time. Also, order quantities are getting ever smaller with batch size 1 becoming a serious goal. For beverage and food manufacturers this means the number of different packagings will continue to rise and so, too, will the need to package, palletise and transport the customer-demanded variety of products more efficiently.

### Packaging and labelling in logistics

Shifting packaging and labelling from production into logistics is one way manufacturers can meet their customer demands for variety. Filled product can be efficiently put into standard crates and moved to the logistics centre. Here, a compact highly flexible repackaging system can repack product as required for transport or final sale.

The advantages of this solution include: optimised transport routes, greater efficiency and reduced handling processes in the bottling hall, improved planning security thanks to demand-oriented repackaging with the latest expiry date and no layer of dust on the packaging.

Labelling could also be a job for logistics. In this case the repackaging system takes on the task of unpacking the bottles and then places, for example, the just-in-time labelled bottles destined for the export market into the dispatcher's packaging.

### Industry 4.0 is bringing new impetus

The beverage world is increasing its interest in automated systems for intralogistics and the level of investment is growing.


Some of the Industry 4.0 ideas have long been a reality in intralogistics: transport systems that organise their in-company routes autonomously and palletising robots that identify empty slots in real time and fill them up. These are just two examples of intralogistics solutions that, thanks to innovative IT, can become internal 'full-service providers' — and organise their operations autonomously.

### The 'Internet of Things' as the missing link

Facilitated by the Internet of Things, the 'smart supply chain' will integrate information from raw material through to the final customer. Already 20 billion items across the globe have their own IP address and are fitted with a chip or sensor and connected to the internet. These items can thus be localised and identified.

They can also interact autonomously with each other — for example, when informed via a weather app that it will be a very hot night, the fridge independently orders beer and meat for the barbecue with the production and delivery of this order organised and processed autonomously.

This vision is not as far off as it seems. A few months ago in the US, the first self-driving truck delivered 2000 cases of Budweiser beer a distance of 120 miles. True, this is an example of external logistics, and not intralogistics.

You can find out more about the current trends and future developments in intralogistics at drinktec 2017. The "world's" leading trade fair for the beverage and liquid food industry" takes place from 11–15 September 2017 in Munich. 





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## Linear motor with integrated drive

Motion Technologies has released the LinMot linear motor with integrated drive. This concept allows the controller to be eliminated from the electrical enclosure for linear direct drives, thus reducing installation time and effort.

On the application side, it becomes possible to efficiently couple the devices in a daisy chain linkage. Clevis and rod ends can be provided to replicate air cylinders and most communication standards can be provided to suit the application. The actuator is rated to IP65 and the motors can be supplied to IP69K and Ex rated.

The linear motors offer full servo control capabilities, high-speed positioning and force control.

**Motion Technologies Pty Ltd**

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



## Convert pipe into conveying system

Exair has added smaller and larger sizes to the air-operated 316 Stainless Steel Threaded Line Vac conveyor product line which convert ordinary pipe into an inline conveying system for food products, pharmaceuticals and other bulk materials. The product is now available with NPT threads for use on sizes from 3/8 NPT to 3 NPT pipes. Featuring large throat diameters for maximum throughput capability, the conveyors are designed to attach to plumbing pipe couplers, sanitary flanges and other pipe fittings.

Available from Compressed Air Australia, the conveyors eject a small amount of compressed air to produce a vacuum on one end with high output flows on the other. Response is instantaneous. Regulating the compressed air pressure provides control of the conveying rate. Construction is durable Type 316 stainless steel to resist corrosion and contamination, and the product can withstand temperatures to 204°C.

Nine sizes are available. Applications include gas, grain or ingredient sampling, part transfer, hopper loading, scrap trim removal, tablet transfer and packaging. Other styles and sizes are available to suit hose or tube. The conveyors are CE compliant.

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## Conveying system for delicate food

Piab's piFLOW t conveyor uses vacuum technology to convey delicate products such as nuts, seeds, beans and lollies, as well as nutraceutical tablets and capsules. A controlled, low-speed, guided entry into the conveyor, and the elimination of all sharp edges, ensures that products are gently handled.

Suitable for transporting up to 4 million items per hour, the conveyor can be used to transport any fragile goods within a processing plant. Gentle flow is maintained by regulating the feed pressure of the pump, ensuring that fragile ingredients or products are handled as delicately as possible.

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## Refrigerated air dryer

SPX Flow has released the Hankison FLEX Series refrigerated air dryer, which uses phase-change material (PCM) to achieve energy savings.

PCM is a material that harnesses latent heat produced as it converts from solid to liquid or liquid to solid. While latent heat is being absorbed or released, the process is isothermal (no temperature change) and the energy from the heat is used to change the form of the material. The PCM has high latent heat properties, meaning it absorbs a lot of heat at constant temperature as it melts or freezes and stays colder for longer periods of time. While the PCM absorbs heat from warm, moisture-laden compressed air, there is no significant rise in temperature.

Designed with a three-in-one heat exchanger, the PCM encapsulates the refrigeration and compressed air circuits. This allows the phase-change material to stay colder for longer periods of time, cycling the refrigerant compressor less often than conventional energy-saving designs.

As the dryer automatically matches the compressed air load at any point in time, it can be sized to the maximum plant compressed air load without a material energy consumption penalty.

The PCM itself is an eco-friendly refrigerant that melts and solidifies above 0°C and does not require the use of glycol, pump, tank or hot gas bypass.

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# How to select the right blender for powder mixing plants

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Whether you are just getting started, or are a seasoned professional, the choice of mixers is so extensive as to be just plain confusing. This article poses some questions to be considered when making that all-important selection.

One of the most significant functions and consequently one of the most important aspects in a powder processing system is blending. In most food applications, it is the major source of increasing value of the products that go into the process. This is the case whether you are manufacturing sports nutrition products or bakery and everything in between.

An increasing challenge in the powder handling industry is how to accommodate a wide portfolio of recipes and vast array of different ingredients, several of which pose an allergen risk. Some companies have been willing to spend significant amounts of capital installing highest speed mixers and packing lines in order to achieve high efficiency and throughput. But just because a mixer is high speed, does it necessarily mean that it provides the best process solution?

### Batch or continuous processing?

Before we get started, the most important decision is whether to batch or continuously manufacture. Do you need to swap recipes on a regular basis or are you producing the same product day in day out? If there are no changes to be made, then it makes sense to consider continuous processing with large fixed mixers which are coupled to the upstream and downstream processes.

However, as most manufacturers are finding, consumers' desire for more variety means more and more recipes being added to the ever-expanding product portfolio. The consequence of which is more recipe changes than ever before and means you need to take a close look at how you plan to conduct mixing. Here batch processing is the only way. The points raised in this article refer mainly to the case for batch processing as it is assumed this is an expanding area of consideration.

### Powder characteristics

A free-flowing powder with similar ingredient particle sizes will mix easily. A more gentle blending approach will work well here, such as tumble blending or ribbon blending.

On the other hand, for cohesive, sticky powders to mix homogeneously, work needs to be applied to the material, forcing the particles to fold and join. In this case, blenders offering high shear in the form of knives or intensifiers are required. Applying the right amount of shear is vital to intermesh and blend the particles; however, if mismanaged, particle degradation and heat build-up may occur.

### Batch size

Big isn't necessarily beautiful for blenders. It might be large enough to match the order amount and batch size, but watch out for loading times. Take into account how long it will take to fill by ripping and tipping 25 kg sacks of ingredients. Then

think about how long it will take to empty the product to packing. During this time the mixer will stand idle and be unproductive, which is not lean. Companies often do not realise the cost of this lost time in filling and emptying the mixer. But it should be challenged for the waste that it clearly represents.

Also consider whether you will have different batch size demands. Do your customers always want the same size orders? Do you have to make small-sized batches of half or a quarter of the large batches? If you have wide variability consider using IBC (intermediate bulk container) systems for blending, whereby different-sized containers can be accommodated on the one blender.

### Mixing time

Don't be fooled by claims of only a four-minute blend time. It's important to weigh up the full end-to-end process stage of blending, from filling the mixer to it being emptied and ready to go back into operation. It might well only take 4 minutes to blend, but it could take 2 hours to load and 3 hours for packing to call off. Giving a total blending time of 5 hours and 4 minutes!

In-bin/IBC blending might take a little longer for the blend cycle (often 10–15 minutes), but in the long run you save time as formulation of the recipe is done offline and the container is removed immediately from the blender and taken off to packing. The filling, mixing and packing process steps take place simultaneously. The blender itself doesn't need cleaning so it is free to go back into service immediately. The only limiting factor is how quickly your operators can install and remove the bins from the blender.

### Changeover time

If you are making several recipe changes throughout the day, using a fixed mixer can be inflexible. You will need to conduct a clean-down each time, thereby increasing the full end-to-end blending time even further.

In-bin blending, on the other hand, offers immediate changeover as there is no cleaning of the blender, enabling up to four batches/hour to be completed.

### Ease of cleaning

It is important to ensure that the expensive, value-adding ingredients aren't 'lost' during the mixing process. Have you ever considered what you might be leaving behind in the blender? All fixed mixers will have some residue left behind at the base of the mixer bowl or clinging to the sidewalls, shaft, paddles and bearings; this product is then washed away during cleaning. This is valuable product that costs money and shouldn't be flushed down the drain.



Bear in mind what 'hold up' areas there might be in the mixer you are choosing.

- Can operators safely and easily access all the corners and joints?
- Are the paddles/shafts removable?
- Are there easy-access doors? What safety locking systems are incorporated?

On a fixed mixer, clean-down time between recipes can vary from as little as half an hour for a dry clean between non-allergen recipes up to taking a full 8-hour shift for a full wet clean and dry. This represents a significant amount of not only waste but manpower costs as this is usually a labour-intensive activity.

With in-bin blending, only the container is cleaned, which is conducted offline. Even if the IBC has a complicated split butterfly valve which needs to be removed for cleaning, this won't affect the OEE (overall equipment effectiveness) rate of the blender as other previously cleaned IBCs will be returned to the manufacturing process to maintain the optimum flow.

### Risk of cross-contamination

With an increasing number of products containing allergens, it can be challenging to manage changeovers and clean-downs. Particularly tricky are the fixed mixers and inline conveying systems because the system is coupled, so it can take a long time to clean down between recipes and to validate that it really is clean.

If different recipes are to be mixed on the same mixer then you need to consider the risk of cross-contamination if cleaning is not done properly. To mitigate the risk, some companies dedicate a blender to any allergen recipes. This is acceptable if only one additional fixed mixer is needed, but is it really practical to consider half a dozen?

For allergen handling, in-bin blending offers a simple, safe solution. Containers can be used one time for allergens then cleaned and used next time for a non-allergen product. A common blender can be used as there are no product contact points on the blender.

### After mixing — segregation risk

Even though the fixed mixer may be providing well-blended material, this does not guarantee production of a quality product as it needs to be transferred out of the mixer. This is when segregation of the mix might occur as air displaced by powder leaving the mixer carries the 'fines' back up through the powder. This is further exacerbated if large product transfer heights are involved. Here the particles have more

chance to move apart and de-mix the blend as some will move faster than others depending on their particle density and characteristics.

You also need to consider the ease of discharge from the fixed mixer. Ensure the mixer empties fully with no residual product held up. Consider the opening size of the discharge point, as some powders might be sticky and will have poor flow properties so are likely to become stuck. Then again, the free-flowing products could suffer from a core flow through these discharge points, which will cause segregation.

IBCs help to reduce the issue of segregation. Not only is the product mixed within the container, but it is then transported to feed to packing where it is coupled to the infeed hopper reducing the drop height. A note of caution, not all IBCs are equal. Those with butterfly valves can still get product segregation issues due to core flow and rolling of particles. Where this is a high risk, it is worth using 'cone valve' IBCs, which offer the best protection against segregation due to product flowing under mass-flow discharge with all particles moving down through the bin in unison.

### Factory space

Don't just consider the size of the mixer itself — take into account what space you need around the mixer for loading and unloading product and cleaning. Also check on what ceiling height is necessary for access above and below.

IBC blenders tend to have a small footprint and head height, so if space is an issue, then it is worth exploring these further. The IBC blenders can be located in open areas with low hygiene control as they provide a closed process.

When selecting a mixer, it pays to do some research. If you choose the right one you also have the added benefits of:

#### Increased capacity


- By reducing the downtime of the mixer for non-value-add functions greater efficiency can be obtained and production capacity increased.
- Quick product changeovers due to no cleaning of the IBC blender provide increased production capacity.
- Multiple batch sizes can be mixed in one IBC blender therefore eliminating the need for multiple mixers.

#### Cost savings

- Through reducing the amount of idle time wastage.
- Incorporating more efficiency in the blending process can reduce the number of shifts required.
- Lower manpower costs for cleaning.
- Minimised lost product via residue or scrap due to it becoming de-mixed.
- Eliminating inventory or WIP.

#### Improved product quality

- Prevent segregation for a better final product that is of high quality every time.
- Removal of the risk of cross-contamination.
- Closed hygienic system.

Don't just be swayed by choosing the cheapest option just to get started or using 'what everyone else has got' (they may not have done as good research as you have). Think differently and see where it may take you. 

Matcon Ltd  
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### South Australia loses as Coca-Cola Amatil remodels its supply chain

Coca-Cola Amatil intends to spend around \$90 million over the next three years to remodel its supply chain.

The company wants to use technology and automation to make its existing plant more efficient. This will involve increasing production in Western Australia and Queensland but closing its manufacturing operations in South Australia.

The Richlands plant in Queensland is scheduled to receive a new glass production line and new dairy and juice production capacity. This \$90 million investment will be in addition to the \$75 million Richlands investment announced in 2016 which has been earmarked for a new, expanded and automated warehouse with greater capacity, comparatively lower operating costs and reduced materials handling and truck movements.

With the closure of operations in SA in 2019, some other manufacturing activities will also shift to Kewdale in Western Australia, Moorabbin in Victoria and Northmead in NSW.

The closure of manufacturing facilities in South Australia will deliver CCA \$20 million in cost savings from 2020.

In announcing the planned closure of operations in SA, Coca-Cola Amatil Group Managing Director Alison Watkins said, "This isn't a decision we have taken lightly, but we know it will be important for ensuring our position in the market into the future.

"The review found that further development of our facility at Thebarton in South Australia was constrained by its CBD location, site layout, dated infrastructure and expensive logistics.

"We need to modernise and invest in new capability across our supply chain to maintain our competitiveness in the market."

Approximately 180 employees and contractors will be affected in South Australia and Amatil aims to work with each one individually in order to provide financial counselling, personal support and assistance in finding new positions. Where feasible, some permanent staff will be redeployed to other positions within the company.

Existing sales, distribution, warehousing, equipment servicing and Statewide Recycling teams in the state are unaffected by the changes.

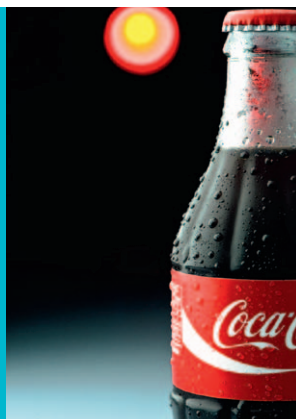


Image courtesy of Andie Banyai (via Flickr) under CC BY 2.0

### New president for the ARA

The Australian Refrigeration Association (ARA) has a new president — Ian Tuena.

Following on from Tim Edwards' term as ARA president, the association will continue to investigate improvements in HVACR services in Australia — especially the potential of natural refrigerant-based technology, which can deliver cost savings and emission reductions.

As Edwards advised: "The amendments to the Montreal Protocol call for global adoption of high-efficiency, low-emissions HVACR technology. Australia has the ability and need to lead this opportunity in the national interest... now."

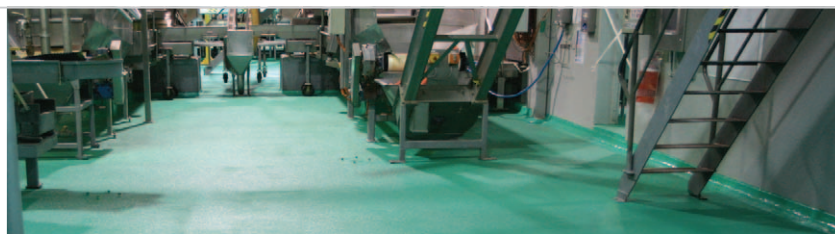
Contact the ARA if you are interested in contributing to the implementation of natural refrigerant-based technology to improve the carbon footprint of HVACR installations (email: [info@ausref.org.au](mailto:info@ausref.org.au)).

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## Ring wrapper

Qimarox has released a shrink wrapper for OEMs and system integrators. The ring wrapper can wrap up to 100 pallets in foil/h and can be integrated in combination with the company's palletising modules.

The wrapper is supplied without a control system, which allows system integrators to combine the control system of both the palletiser and the ring wrapper (and any other system components) in a single control unit, allowing for the simplification of control and integration of various components.

The ring wrapper is of steel construction resting on four columns, resulting in a machine which is stable and robust, and capable of operating at high speeds. The machine is provided with a pre-stretch system, which can stretch the film by 300%. Partly because the foil is applied under constant tension and batched, relatively little film is needed for stabilisation of the load. The film rotates, rather than the pallet, so even unstable stacked pallets can be wrapped in foil.

The wrapper can start and stop wrapping at any height, so that stacked pallets can also be stabilised separately. The film welding and cutting system applies a double welded seam at a controlled temperature and welding time, eliminating loose bits of foil and making the pallets suitable for automated storage systems. The wrapper can automatically apply a cover sheet so the pallets can be made dustproof or waterproof, depending on the wrapping program.

The modular design simplifies repair or replacement of parts.

**Qimarox**

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## Vacuum lifting

Dynapumps supplies a range of standard and custom vacuum lifters that provide material handling solutions for multiple applications.

Providing a full range of vacuum system components — from suction cups, air, mechanical and electric vacuum pumps and vacuum generators, vacuum gauges and ergonomic vacuum lifters, to complete vacuum lifting systems — the company manufactures complete systems and can arrange for installation and commissioning.

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## Multidirectional ball belt

The uni QNB Ball Belt is a multidirectional belting product that enables a number of key functions. Its integrated rotating balls — at a surface density of 1550/m<sup>2</sup> — can be activated and deactivated to control the belt's multidirectional movement, allowing goods to be aligned, rotated and separated to order, with acceleration and deceleration of conveyor speed appropriately controlled.

An additional feature is the ability to slow the speed of the belt at certain points for such tasks as inspection. Auxiliary belts can be installed to create additional spheres of movement for products — turning them around or transferring them from left to right, for example.

Because the sockets for the balls are built directly into the belt links, the belt has 2.5 times the tensile strength of its nearest competitor, according to the company. Due to the belt's more closed surface, it is harder for contaminants to enter and hinder the balls' movement.

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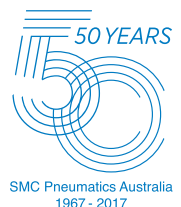
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# No chickens or ducks were slaughtered to make this meat



*Duck l'orange.  
Courtesy Memphis Meats.*

**While very popular as a protein source, chicken and duck production is pretty tough on the environment. Couple this with growing consumer queasiness about animal welfare and food safety concerns and the environment is perfect for the development of the 'clean' meat movement.**

Consumers are spending over US\$750 billion per year on meat, and this is expected to grow substantially in coming years. Chicken is the most popular protein source in the US where consumers each eat around 40 kg/year, creating an industry worth US\$90 billion/year. While in mainland China duck rules the roost. The Chinese population goes through 2.7 billion kg of duck each year, more than the rest of the world combined.

But is this level of production sustainable? The environmental impact of raising animals for food is massive and many consumers would prefer protein that is more humanely acquired.

Enter San Francisco-based Memphis Meats. This company has developed both duck and chicken meat that is grown directly from poultry cells without involving raising any animals at all. By producing meat directly from animal cells, the need to feed, breed and slaughter animals will be obviated.


Not only will this be a much more humane way to provide protein to consumers, it has been estimated that this method of production will result in up to 90% less land and water needed and 90% less greenhouse gas emissions, land and water than conventionally produced meat.

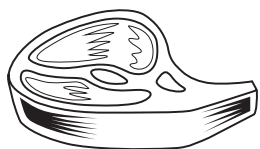
The company is building a technological platform to produce new clean meat products and accelerate clean meat innovation. The multianimal platform will allow Memphis Meats to produce many types of meat and to even control and modify the taste, texture and nutrition profile of its products.

The platform will also enable the company to scale up production and rapidly reduce costs.

"It is thrilling to introduce the first chicken and duck that didn't require raising animals. This is a historic moment for the clean meat movement," explained Uma Valeti, MD, co-founder and CEO of Memphis Meats.

"Chicken and duck are at the centre of the table in so many cultures around the world, but the way conventional poultry is raised creates huge problems for the environment, animal welfare and human health. It is also inefficient. We aim to produce meat in a better way, so that it is delicious, affordable and sustainable. We really believe this is a significant technological leap for humanity, and an incredible business opportunity — to transform a giant global industry while contributing to solving some of the most urgent sustainability issues of our time."

It is hoped the chicken and duck products will be ready for the marketplace by 2021. 



### Strong demand forecast for ready-to-eat poultry packaging

As consumers continue to seek convenient, affordable meal options that require little or no preparation, often combining a precooked product with home-prepared side dishes, demand is in turn stimulated for a variety of packaging products such as domed plastic containers, trays, bags and foil containers.

In the US, roasted chicken and turkey are some of the most popular products in this segment, and a study by industry research firm Freedonia Group projects that in the US the demand for packaging for ready-to-eat poultry will climb 4.6% annually to \$450 million in 2021.

The ready-to-eat market comprises packaging of prepared foods by foodservice operations of supermarkets, convenience stores, mass retailers and stores such as natural foods stores and club stores, and excludes precooked products from food manufacturers.

The report, Poultry Packaging Market in the US, forecasts that packaging demand in the ready-to-eat market will be boosted by the continuing popularity of store-made prepared foods in the retail segment. The largest share of demand in the ready-to-eat poultry packaging market will be held by plastic containers such as large domed containers for the packaging of rotisserie chicken and roasted turkey breast products.

Paper bags and folding cartons, usually with windowed portions, are also used in this segment for the packaging of fried chicken products, while plastic film and trays are used to package a wide range of ready-to-eat meals including prepared chicken breast products, and smaller portions of roasted and fried chicken.



### Consumers are choosing meat in pouches

In the US, demand for meat packed in pouches is increasing as consumers embrace the convenience factor. And there is no reason to assume antipodean consumers are not likewise purchasing pouch-packed product to make meal preparation simpler.

The Freedonia Group has released the study 'Meat Packaging Market in the US', which forecasts that pouches used in meat packaging in the US will climb 5.3% per year to \$220 million in 2021, with unit gains expected to advance 3% per year to 1.6 billion units.

Stand-up pouches are well-positioned for growth in the frozen meat and jerky sectors, while retort pouches will continue to see more use in the packaging of processed meat.

The benefits of packing processed meats in pouches include the ability to be easily displayed (resulting in greater use of stand-up formats), peggable formats and high-quality printing. Additionally, the ability to integrate value-added features has allowed pouches to gain share in all major markets for meat packaging.

On the downside, cost and slower production speeds will limit gains for many processed meat applications. Furthermore, the packaging of ready-to-eat meat products in pouches is not feasible in many cases due to the fact that these often must remain upright in their packages.



### More protein on the table for those in need

More protein is on the menu for Australians in need thanks to a new partnership between food relief agency Foodbank and MDH, a family-owned beef cattle enterprise.

MDH has agreed to donate 1 tonne of beef trim each month, which will in turn create 220,000 sausages per year for struggling Australians who might otherwise go without.

Thanks to an innovative meat program, which involves the support of many companies in the supply chain, fortnightly deliveries of sausages go from the factory of Primo Smallgoods, a Foodbank manufacturing partner, to distribution centres around Australia. MDH will join Foodbank's existing partners, Thomas Foods International and Fletcher International, which are also family-owned rural enterprises.

Working with the Australian food and grocery industry, in collaboration with farmers, manufacturers, suppliers and the government, Foodbank provides food for 166,000 meals a day to over 2400 charities and 1500 schools for distribution to people seeking food relief.

"It has long been a goal of Foodbank to have a significant and sustainable meat program because of the vital role protein plays in a balanced diet and the relative difficulty we experience in obtaining it through our traditional rescue channels. MDH's generosity is helping us to realise this dream," said Brianna Casey, CEO of Foodbank Australia.



## Exports keep the meat industry growing

Meat processors are benefiting from strong export demand for Australian beef, with many experiencing revenue growth in 2015–16. As a result, numerous meat processors made large gains in IBISWorld's Top 100 Food & Beverage list.

Both JBS and Teys have continued to consolidate their position as Australia's largest meat processors, albeit using different strategies. While Teys has increased its prices to benefit from reduced competition, JBS has expanded through export markets and strategic acquisitions.

An established player in the meat processing industry, contributing an estimated 13.7% of industry revenue, Teys reported revenue growth of 21.7% to reach \$2.92 billion for 2014–15. With significant demand for beef coming from export markets, Teys has capitalised on this by increasing prices for its exported products, which has benefited company profit margins. With weak production volumes in the United States due to high feed costs, high operating costs and a prolonged drought, Teys has benefited from reduced competition in export markets. While a prolonged drought has negatively affected production volumes in the United States, drought conditions in eastern Australia have resulted in high cattle numbers being processed, with cattle farmers forced to sell as feeding costs soared.

JBS also thrived over the 2015 financial year, reaching an estimated 26.2% of industry revenue. The company capitalised on strong global demand for meat by expanding into export markets such as South Korea, Japan and China, and these increased sales to Asia, combined with the depreciation of the Australian dollar and increasing slaughter rates, lifted JBS Australia's projected revenue by 17.6% to reach \$5.38 billion for the year ending December 2015. Acquisitions have also played a large part in the company's success.

Over the next five years, IBISWorld expects growth among processors to slow; however, it is anticipated that the continued reliance on export markets and consumer preferences for higher quality products will help offset this slowdown, which is caused by a mature domestic market and increased demand for poultry products.



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# Plate freezers

## — one of the 'hidden secrets' driving Australian beef's international success

Jon Condon\*

**What's driven the massive investment by Australian red meat processors in large-scale plate freezing technology over the past few years? Jon Condon\* took a look at a piece of somewhat obscure and perhaps little-appreciated processing technology which in no small way is helping consolidate Australia's reputation as the world's best beef exporter, based on quality, consistency and product performance.**

Costing up to \$10 million each, refrigeration company Milmeq has installed 190 plate freezers in Australia, the majority in meat processing plants. And, in the last three to four years there has been a sharp rise in installations with all but one going into meat processing applications.

Virtually all of Australia's top 20 red meat processors now use large-scale plate freezers in their operations with JBS, Teys, NH Foods and Thomas Foods International all heavily committed to the technology.

A large installation was completed at Teys, Beenleigh, in 2016 and more recent projects have gone in at Northern Co-operative Meat Co at Casino, Linley Valley in WA and John Dee near Warwick.

Sheep processing facilities have also been active, including a large installation in 2016 at Fletcher International's Dubbo mutton and lamb plant.

JBS Dinmore, the largest beef processing plant in the Southern Hemisphere, operates no less than 10 of the large-scale plate freezer units, allowing the facility to freeze up to 800 tonnes of carton meat daily.

### Australia's dedicated export focus

The Australian beef industry's heavy orientation towards export is one reason why plate freezers have been adopted so widely in red meat processing over the past few years.

In 2016, more than 70% of all beef produced in Australia went into export markets, and of that, almost 740,000 t, or 72%, went out in frozen form.

In contrast, adoption of large-scale plate freezers in competing beef-producing countries overseas has been remarkably low. In the US, for example, about 90% of beef is consumed domestically, and US exports tend to be in higher-end chilled product. This removes some of the need for plate freezer infrastructure. In South America, there is almost no use of





“The Australian beef industry’s heavy orientation towards export is one reason why plate freezers have been adopted so widely in red meat processing over the past few years.”

of our processor clients told us that when the A\$ went below US85–90c in value, they would start talking again about buying plate freezers. And that’s exactly what happened.”

### What are plate freezers, and why are they so special?

In an insulated room large banks of horizontal freezing plates are positioned within a steel frame. Liquid ammonia circulates through the movable plates, enabling them to rapidly and efficiently cool cartons of meat by transferring heat by conduction from the product to the evaporator. Up to 40 levels of plates, called stations, stacked up to 20 metres high, are included in some systems.

Plate freezers replace conventional blast freezing tunnels, which are simply insulated coldrooms circulating fan-forced cold air.

While smaller plate freezing systems have been in use worldwide for decades, they were limited to freezing thin carton blocks, no deeper than 75 mm, typically used for seafood. It was the Australian development of so-called large-scale plate freezers that allowed typical 27 kg meat cartons up to 175 mm deep to be handled that was the catalyst for adoption in beef plants.

The first prototype designed by Milmeq founder Klaus Visser was installed at Tancreds Meatworks at Beaudesert in 1985, under a federal government-backed project designed to deliver greater efficiencies and productivity in red meat processing. The old CSIRO Meat Research Laboratory at Cannon Hill was also heavily involved.

While the original designs were small, manually loaded set-ups handling only 100–200 cartons at a time, modern automatically loaded and unloaded systems range anywhere up to 3000 cartons in capacity. Sometimes multiple systems are installed in the same plant. New innovations, including single-station opening, are providing further attractions for smaller-scale plants and more efficient use.

### Weighing up the advantages

Installation of a modern plate freezer facility can cost more than \$10 million for the largest applications, including the insulated building itself and automated loading and unloading. But Milmeq says it also does a lot of installations in smaller factories in the \$1–\$4 million range. Total investment in the technology may have topped \$50–\$80 million in the past three or four years, one estimate has suggested.

Plate freezers may carry an eye-watering installation cost, but once in operation, offer a host of advantages. The main ones include:

plate freezers as yet in beef processing, but the region is seen as a potential growth market for the technology.

One factor that has clearly sparked Australia’s recent massive investment in plate freezers is processor profitability. The high margins enjoyed by processors during 2014–15 — when slaughter cattle were cheap and abundant due to drought conditions and international beef demand exploded with the arrival of new markets like China — has been a big driver in investment.

As bad as conditions are currently for processors, those high-profit years provided a ‘piggy bank’ which is now being re-invested in expensive plant infrastructure like plate freezers to try to stay ahead of international export competition.

Brendan Dever, Milmeq’s business development specialist, has seen a lot of changes in processing since working on the first plate freezer installation in 1986. He agrees that profitability had sparked the rush of installations seen in recent years.

“We saw a real drought in orders for plate freezing systems between around 2009 and 2013,” he said.

That coincided with the global financial crisis, and the lack of processor profitability during the very wet years of 2011–12, when producers held cattle back to build herds, forcing processors to pay higher prices for stock.

“Another factor was the movement in the Australian dollar,” Dever said. “In the years leading up to 2014, quite a lot

### Better presentation:

Cartons handled in a conventional blast freezer can distort and 'bow' as the product freezes and expands. This can create problems with stacking and pallet stability, and can compromise the total volume of beef that can be loaded into a shipping container. Cartons frozen in a plate freezer remain absolutely square, like bricks, because of the flat-sided plate compression from both sides. Some processors claim they can load an additional 1.5 tonnes of plate-frozen product into a 20-foot export container, because of better carton shape. Equally at the other end, the product opens up and transports much better.

### Shorter freezing cycles:

A typical conventional air-blast freezer will take 48 hours to fully freeze a load of 27 kg meat cartons, meaning twice as much capacity is needed to freeze each day's kill. In contrast, much more efficient plate freezers work on a 24-hour freezing cycle (many complete the job in 16–20 hours), meaning only half as much capacity is needed for each day's kill. That, in turn, provides an inventory saving, meaning the processor needs to 'own' one day's less production between slaughtering and market.

### Energy efficiency:

In round numbers, a typical plate freezer installation will use about 90 kW of electricity to freeze one tonne of meat. Compare that with even the most modern air-blast style freezers which use about 125 kW/t and it represents an energy saving of around 30%.

### Food safety, meat quality:

More rapid, even freezing produces a better quality product when thawed and, especially in items like offals, has significant food safety implications. Essentially, quicker cooling time means less chance for bacterial development.

### Big plate freezer investment adds flexibility, efficiency for John Dee

There's been massive investment made in plate freezing technology across the Australian meat processing industry over the past few years, providing our exports with a strong point of difference in performance in international beef markets.

The latest Australian red meat processing installation was commissioned in January 2017 by Queensland export beef processor John Dee for an all-up cost of around \$6.5 million.

The John Dee plate freezer installation, supporting two stacks, each with 14 sets of plates, has capacity to freeze 3800 beef cartons per day. While the temperature in the room itself is around -20°C, the liquid ammonia-filled plates themselves get down as low as -40°C. That effectively applies rapid freezing from both the bottom and top sides of the carton at once.

The new plate freezers will be used in conjunction with existing blast tunnels that have been retained at the plant.

"The plate freezer adds an element of flexibility to the ratio of chilled to frozen that we can produce through the plant for our own requirements, as well as those for our service kill customers," John Dee Director John Hart explained. Service kill clients at the plant currently include Rangers Valley, AA Co, Stockyard and Hancock Prospecting's new 2GR Wagyu brand.

"Different markets have different requirements. Chilled is still the majority of what we produce and sell, but for example, a lot more frozen product is going to China," Hart said.



"If we or our service kill customers get a lot more orders that way, we now have the capacity to quickly and efficiently freeze down that product."

In the case of the first volumes of beef under Hancock Prospecting's new 2GR Wagyu brand produced recently, the product was frozen at the Chinese customer's request, to make it easier to manage under the still-developing cold chain systems in place in the China market. In simple terms, frozen product can often get to the end user in China more reliably than chilled.

Hart said the new plate freezing systems could freeze-down product in 16–20 hours, depending on the item in the carton — roughly the same time as it takes to chill beef to required core temperatures. This made it much easier to get orders and shipments together from specific runs of cattle, without having to wait for the freezing process to complete.

"Previously, freezing capacity and performance was one of the plant's limiting factors," he said.

"And from an energy perspective, the plate freezers use 30% less energy than conventional blast tunnels, because they do not run big fans. Refrigeration is one of the major costs in running a processing operation."

The quality of product produced from rapid plate freezing was also better, eliminating problems like dark rings that could occur with slow freezing.



*\*Jon Condon is the founder and publisher of national online beef industry news and information service Beef Central. As one of Australia's most experienced and respected agricultural journalists and commentators, he has been part of the fabric of the nation's beef industry for his entire life. He spent his early life in the Northern Territory, where his family built and operated a successful export beef processing plant at Katherine, and an extensive cattle property in the East Kimberley. For the past 30 years he has specialised in reporting on the red meat and livestock industries, firstly in print with Fairfax, and for the past six years as proprietor and publisher of Beef Central and companion websites Sheep Central and Grain Central. He has authored two books on beef industry affairs — both histories — based on the Australian lotfeeding industry and Stanbroke Pastoral Company.*



## Intelligent portion cutter

The Marelec Portio portion cutter is suitable for fresh products such as fish fillets, whole fish, meat and poultry products. Different knife types and product fixation systems can be chosen to different product types.

A product is fed on the infeed belt. A three-dimensional laser scanner then calculates its volume. A preset weight and shape frame is selected from the program menu. The portion computer then calculates where to cut.

The main difference between the Portio 1 and Portio 3 are the number of cameras. The Portio 1 has one camera and is suitable for flat products, whereas the Portio 3 has three cameras and is able to properly scan rounded products.

For products exceeding certain dimensions, both machines can be equipped with 300 or 350 mm belts rather than the standard 254 mm width belt.

An optical checkweigher can optimise the precision with changing product characteristics.

The machine can be completely opened for easy cleaning and the belts can be taken out for separate cleaning.

For maintenance, easily obtainable spare parts have been selected. All motors and encoders are situated away from the wet area.

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## Urethane belting for protein processors

The Gates Mectrol Food Conveyor belting range includes PosiClean, CenterClean and FlatClean easy-to-clean urethane food-grade processing belting.

PosiClean is a positive drive replacement for plastic modular belts in the protein processing industry, with sealed Kevlar tension members to eliminate belt stretch and a tooth construction that extends across the full belt width for better torque distribution.

The belts can be cleaned in place, saving labour, water and wastewater disposal, when compared to plastic modular belting, according to the company.

The polyurethane food conveying belts are chemical and water resistant, and won't degrade in response to cleaning. The belting also meets FDA requirements for wet food contact, is USDA accepted for meat, poultry and dairy processing equipment, and can be used with a variety of other food products.

The conveyor belts are constructed to reduce the risk of bacterial contamination: the smooth surface allows for cleaning to a microbiological level and sealed edges and tension members prevent ingress of microbes, which means no hinges or pins that can break and contaminate products. The belts do not require the use of position limiters.

When the belt needs to be removed often to clean the structure, or for less hygienically demanding applications, the PosiLace pin-fastened method means the belt is joined by a single pin, allowing for removal and replacement of the belt as often as needed.

Dewatering belting is available for seafood or dairy processing applications requiring draining. All belts can be provided with straight or scooped cleats, sidewalls and V-guides.

**Gates Australia Pty Ltd**

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## Natural shelf-life extender for chilled meats

Arjuna Natural Extracts has developed X-tend, a natural, formulation-specific preservative designed to increase chilled-meat product shelf life and ensure food safety.

The formulation can replace chemical nitrosomyoglobin-forming preservatives and is non-carcinogenic and safe to use in chilled meat. It is potent and prevents the growth of yeast and mould in chilled meat products.

The biggest challenge in replacing synthetic preservatives involves flavour masking (blocking unwanted or undesired flavours) while creating the correct functional mix of natural ingredients to combat a range of microbial activities. The formulation provides a natural solution for a variety of problems typically encountered in chilled meat products, such as microbial spoilage, oxidative rancidity, short shelf life, off colour and altered flavour. It retains natural colour and freshness and extends chilled meat shelf life by up to 15 days, according to the company.

The preservative is available in both liquid and powder forms.

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## Thermoforming packaging machine

The Multivac R 235 thermoforming packaging machine has been designed for producing flat packs of sliced products. A quick-change system for the forming and sealing dies makes it easy to convert the machine to other pack formats. Various labelling and marking systems can also be integrated easily. The R 235 can also be equipped with a jumbo film unwind for lower webs to reduce machine downtime.

Furthermore, the R 235 has an interface for linking a slicer. Thanks to a space-saving infeed construction, the loading conveyor of the slicer can be placed horizontally at the height of the film level. Thus no additional transport conveyors are necessary — this saves valuable space and reduces the investment expense.

For the loading of packs with sliced goods, two different loading systems are showcased on the line, the horizontal loader as well as a pick-and-place system. Both systems are designed to insert sliced products into packs safely and hygienically with a high cycle output.

Packs of sliced products are labelled by the L 330 conveyor belt labeller; the line is equipped with the H 130 handling module for cartoning.

**Multivac Australia Pty Ltd**

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

## Fish freshness measurement

Fishermen, processors, distributors, buyers, retailers and consumers can answer the question “How fresh is this fish?” objectively and with certainty with the Seafood Analytics Certified Quality Reader (CQR). The handheld, non-invasive device uses electrical currents to instantly provide freshness data for fish species and other seafood.

Currently, the device can detect the freshness of more than 10 fish species and generates a Certified Quality Number (CQN), fresh or previously frozen determination, time on ice (ie, time since harvest), shelf life remaining, and US and European sensory equivalence scores (FDA and Torry).

The device works by measuring the rate at which the cells inside fish change over time depending on conditions. The technology has been validated by Oregon State University Seafood Research & Education Center, which concurrently measured degrading seafood with a CQR device and sensory evaluations and concluded the CQ number strongly correlates with the FDA sensory decomposition score based on FDA guidance, and that CQ numbers may be used as an effective quality control tool by seafood processors and buyers.

The device can be used anywhere from catch to frozen, or catch to consumption.

**Seafood Analytics**

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# Longer shelf life



Don KRC Fresh Division (part of George Weston Foods) wanted to increase its exports but realised that it needed a packaging system that would enable its quality products to remain fresh for longer if this was to be achieved.

**“S**helf life extension is critical for retailers and for consumers. Retailers are currently challenged by loss rates in modified atmosphere packaging (MAP) case ready fresh meat cabinets, which we were using to supply fresh pork to retailers. We recognised markdowns and limited distribution as an opportunity for shelf life advancement,” Don KRC Fresh General Manager Matt Cartwright said.

“We knew that we needed to make an improvement and that was the essence of the brief we provided Sealed Air,” he added.

In addition to shelf life extension, Don KRC acknowledged that improvements to product aesthetics was a must, particularly for export markets, which generally demand higher standards.

Packed in a polypropylene tray and multilayer lidding film, the existing MAP solution achieved a shelf life of 14 days. While this served Don KRC’s current product range and business, the shelf life was deemed a limitation for further new product or market development.

Extensive trialling of Cryovac Darfresh skin packaging saw the product shelf life increase from 14 days to 28 days. This improvement allows a host of benefits to be realised by processors, retailers and consumers:

- More product movement at retail level leading to fewer markdowns and less waste.
- The absence of product purge facilitates extended shelf life and enhances consumer appeal.
- The total vacuum skin seal allows retailers to vertically display the products.
- Better merchandising and product aesthetics drives more sales and ultimately less waste at retail.
- The longer shelf life gives consumers a larger window to consume the product.
- Thanks to the skin-tight vacuum seal, consumers can conveniently freeze the product in its original package. The absence of ice crystals in vacuum-packed products prevents product dehydration and allows for a premium eating experience even after the product has been frozen.
- The easy-open feature is popular with consumers.

DON Fresh National Marketing & VA Manager Tina Pitman, who had overseen the project in partnership with Sealed Air’s

Food Care division, shared that the new packaging enabled the company to become ultimately more competitive. “Darfresh vacuum skin packaging solved our previous distribution limitations with MAP, allowing us to be more efficient both operationally and logistically and for our products to reach their destination well presented,” she said.

Don KRC Fresh launched its So Tender fresh pork range in Darfresh skin in February 2016. The product has exceeded sales expectations with significant growth forecast into the next financial year. The switch from MAP to Darfresh skin saw an immediate spike in sales (just over 80%). Just over a year later, the project has been running strong. Tina Pitman said, “We have launched into 16 IGA stores across South Australia, and recently in March, So Tender was launched nationally into Food Works. Retail acceptance is strong and smaller stores have the confidence in the product as the extended shelf life is a key driver in reducing retail shrink.”

In terms of meeting Don KRC Fresh’s sustainability goals, Darfresh reduced the use of packaging by 12% compared to MAP. Further reductions were also applicable in the size of outer cartons used, which meant cost savings with transportation.

“The new Darfresh packaging format has truly been a win-win proposition for everyone,” said Tina. “Consumers pick up the premium quality products with matching visual expectations. The environmental wins by using Darfresh have not only been realised with a reduction in transportation costs, reduced packaging costs and just as importantly the consumer discards less packaging after consumption, which is less landfill. It has excited our business!”

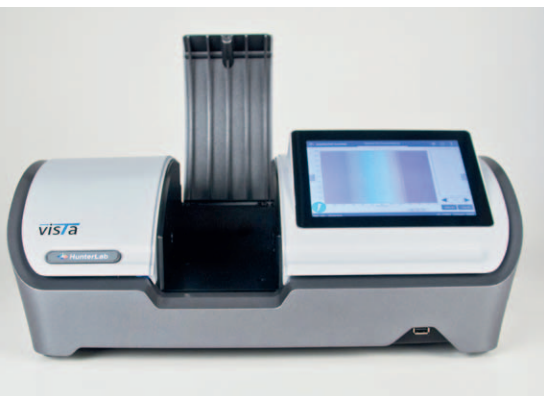
The new capabilities provided by Darfresh have propelled Don KRC’s readiness for the future and business expansion. “We are now able to capitalise and build upon the momentum of the local pork industry and lead the local producers’ foray into overseas markets,” Matt said.

“Don KRC is always looking to lead and support innovation in Australia’s pork industry. Exploring the Darfresh platform to drive expansion has been key to help drive that growth more effectively.”



Sealed Air  
www.sealedair.com





## Visible transmission colour and haze spectrophotometer

HunterLab has introduced Vista, a visible range transmission colour and haze spectrophotometer that achieves simultaneous colour and haze measurements.

The design aims to meet the needs of laboratory professionals by allowing various sample types and sizes to be measured effectively, providing spectral transmittance data for liquids, film and/or solids.

At Vista's core is the ability to automatically capture haze results during colour measurement, providing the QA indicators needed for increased product integrity and improved manufacturing processes.

The spectrophotometer features one-touch internal standardisation, USB and ethernet connectivity, plus the ability to save, print and email directly from the instrument.

HunterLab EasyMatch 'Essentials' Colour Management Software is embedded with Vista. EasyMatch Essentials, is built on smart OS technology and offers applications to streamline production, allowing users to create their own workplaces to meet specific application workflow needs.

Essentials is provided preloaded with most colour scales and indices, including Pt-Co/Hazen/APHA, Gardner Colour, four Pharmacopoeia Standards — US, EU, Chinese and Japanese, Haze %, Opalescence, Y Total Transmission, CIE Spectral Data and more.

**Novasys Group Pty Ltd**

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

## Handheld hyperspectral imager

The BaySpec Compact OCI-2000 Snapshot Hyperspectral Imager features high-performance hyperspectral/multispectral real-time imaging in a compact handheld form weighing only 363 g. The imager acquires full, VIS-NIR hyperspectral/multispectral data with high spectral resolution at one snapshot. Applications include food quality sorting, airborne mini UAV, agriculture and remote sensing.

A wide range of objective lenses enable wide-angle to close-up views. The imager has a spectral range of 600–1000 nm, depending on objective lens used, ~32 spectral bands and spectral resolution of <10 nm.

Scalable to high-volume production, the unit offers continuous hyperspectral data capturing at video rates, along with a LED-backlit high-resolution touchscreen display.

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# Testing



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## Using shellfish to fight food poisoning

Shellfish is often blamed by diners if they feel unwell after a meal, but new research could recast crustaceans as the heroes rather than the villains in the fight against food poisoning.

Chitosan — a natural carbohydrate derived from crustacean shells — has been found to have potential to fight *Clostridium perfringens* food poisoning, which causes abdominal pain, stomach cramps, diarrhoea and nausea.

Present in soil, decaying vegetation and the intestinal tracts of vertebrates, *C. perfringens* typically infects humans when they eat meat that hasn't been thoroughly cooked or properly stored, allowing the bacteria to multiply. It is the second-most common bacterial foodborne illness in the US after *Salmonella* poisoning. Patients often mistake it for a 24-hour virus, so many cases go unreported.

The tests involved both laboratory growth medium and cooked, contaminated chicken meat left for several hours at 37°C. The study looked at the full life cycle of the *C. perfringens* bacterium, which produces tough, metabolically dormant spores that are able to survive many food processing approaches.

The researchers found chitosan blocked *C. perfringens* growth in cooked chicken. It was also found to inhibit spore germination and outgrowth, restrict the spore core from releasing dipicolinic acid, which is associated with an early step of spore germination, and limit the growth of vegetative cells that are actively growing as opposed to producing spores.

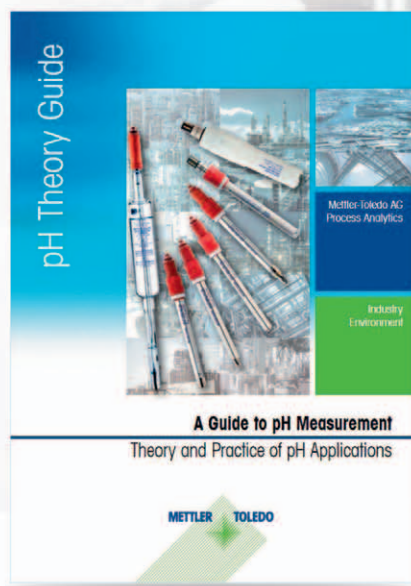
The next steps are researching chitosan's effectiveness in other types of meat and meat products and optimising the conditions for using it. It's possible, for example, that chitosan may work best when combined with other food preservative chemicals such as sorbate and benzoate.

The results were published in *Food Microbiology*.

## Guide to pH Measurement

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## Rheometers

Anton Paar has introduced the MCR 72 and MCR 92 rheometers. Both models are streamlined for the daily lab routine and are easy to use in a plug-and-play fashion.

The MCR 72 is equipped with a ball-bearing motor, which means it is robust in use and no compressed air is required. It is designed to investigate the deformation and flow behaviour of a sample. The MCR 92 has an air-bearing motor for accurate measurement of sensitive samples. This rheometer is recommended for observing a sample's structure.

The automatic motor-driven elevation mechanism of the measuring head and the SafeGap feature ensure that the setting of the measuring gap is always identical for every measurement and 100% reproducible every time. Other features include the TruRay lighting of the measuring surface, one-hand connection of the measuring systems and an automatic recognition tool for measuring systems and temperature units.

**MEP Instruments Pty Ltd**

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

## Dilution of beer and wine for alcohol analysis

There are several techniques for measuring the alcohol concentration of beer and wine. For facilities with numerous samples to process, the technique of choice is gas chromatography (GC). To prepare samples for analysis by GC, they must first be diluted and spiked with an internal standard. The Hamilton Microlab 600 accomplishes this task in a single step, delivering the diluted sample directly into the GC vial.

Alcohol testing is regulated and requires reliable and traceable methods. The Microlab 600 is a highly precise syringe pump with a graphical user interface and comes complete with a calibration certificate that is traceable to N.I.S.T. standards.

This positive displacement system provides better than 99% accuracy, independent of a liquid's viscosity, vapour pressure and temperature. The inert fluid path minimises sample carry over and improves compatibility with harsh chemicals. Dilution and dispensation methods are stored on the system and recalled prior to use, ensuring that the same method is followed day in and day out. The user simply triggers the hand probe to aspirate or dispense the liquid. By automating the pipetting functionality, technique-dependent variability is minimised.

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# Testing



NEWS



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## Fast testing system for *E. coli* and *Listeria* in leafy vegetables validated

The Institute for Food Microbiology in Israel has validated Yarok Technology Transfer's test method for the fast detection of foodborne pathogens in leafy vegetables. The validation procedure, carried out following standards formulated and required by the US FDA and the European Pharmacopoeia for validation of new testing methods, established that the method is implementable in industrial and commercial laboratories.

Yarok, an innovation-based developer of fast, accurate tests for the fresh food Industry, has developed a testing system for the fast and accurate detection and count of *E. coli* and *Listeria monocytogenes* in leafy vegetables.

The fast testing method can provide reliable results for *E. coli* presence/absence assessment in 4.5 hours and for *L. monocytogenes* in 8–9 hours. These times to result (TTR) are significantly shorter than those produced using rapid systems, and vastly shorter than those obtained with traditional methods.

The validation confirmed that the fast testing method showed a higher sensitivity (lower detection limit) than the reference conventional analytical method in *E. coli* presence/absence tests, being able to provide count results for a single bacterium in the sample. The validation concluded that the new fast testing method is suitable for use in routine testing for detection (presence/absence) and count of *E. coli* and *Listeria monocytogenes* in leafy vegetables.

## Flexible package leak tester

The Seal Tick TSE6086b tests flexible packages for leaks and gives go/no-go answers independent of the operator. It can find holes as small as 10  $\mu\text{m}$  in diameter. It's used to test biscuits, snack foods, salad, MAP packs, milk powder, medical bandages, pharmaceuticals, etc. The package contents are not stressed and passed products can be put back onto the production line. Its testing chamber is designed to fit most package sizes found in the supermarket. Items are placed manually and the handle is closed to initiate a fully automatic test sequence. Results are displayed with Pass or Fail lamps, along with a quantitative measure of the leakage rate.

The device performs sensitive leak measurement without stressing package contents and is simple to operate — the test initiates from handle closure. A wide range of pack sizes and shapes is accepted without adjustment and rapid testing can be performed from 5–15 s for most standard packs. Internal generation of test vacuum can be from compressed air or optionally by external vacuum pump. Results are logged into a spreadsheet importable format for trend analysis and traceability, while an internal web page provides up-to-the-minute status. The testing device is constructed of stainless steel.

**Bestech Australia Pty Ltd**  
[www.bestech.com.au](http://www.bestech.com.au)



## Automatic potentiometric titrator

Hanna Instruments has released the HI901C automatic potentiometric titrator. The high-performance autotitrator is suitable for the most essential applications and serves as a benchtop meter for direct sample measurements.

The HI901C autotitrator's precise dosing system can facilitate high throughput in the most challenging lab environments.

The HI901C can be used for a variety of applications including acids, bases, redox and selective ions. In addition to titration mode, the autotitrator also operates as a fully functional pH, redox and ion selective electrode (ISE) meter.

A dynamic dosing algorithm keeps titrations timely and accurate, making analysis more efficient.

The instrument's 40,000 step piston driven pump is capable of dosing very small and highly accurate volumes of reagent, helping to achieve precise endpoints.

**Hanna Instruments  
Pty Ltd**

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



## Coliform and *E. coli* test for water

Traditional methods for testing Coliforms in water often require filtering the sample, which adds to the time, complexity and cost of performing a test. Nissui Pharmaceuticals' EC Blue, available from AMSL Scientific, is a rapid Coliform and *E. coli* test for water samples. Results are available in 18–24 h and a simple colour change from clear to blue will indicate the presence of total Coliforms. If *E. coli* is present, then the sample will also fluoresce under UV light.

The test is ready to use, shelf stable and available in several different formats, such as jars, sachets and tubes. The jars are convenient as they are sterile and ready to use, all the user needs to do is add 100 mL of sample to the container and incubate. The sachets are versatile as users can add the media to any sample in a suitable container such as a bottle or Whirl-Pak bag.

Quantitative results with test are also available via the use of the tubes or the MPN Tray.

For more information, click [here](#).

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# Detecting mercury contamination in fish

**Researchers from the University of Burgos (Spain) have developed a fluorescent polymer that lights up in contact with mercury that may be present in fish.**

**D**ue to mercury's toxicity, consumers — and especially pregnant women — are very keen to minimise their exposure to the metal and are well aware that consumption of fish is by far the most significant source of ingestion-related mercury exposure in humans.

Some mercury in the environment comes from natural sources; however, in the last decades industrial waste has caused an increase in concentrations of the metal in the aquatic environments. In the food chain, mercury can be diluted either in organic form as methylmercury,  $(\text{CH}_3\text{Hg})^+$  or as an inorganic salt, the cation  $\text{Hg}^{2+}$ .

The concentration of mercury in any given fish depends on the species of fish, the age and size of the fish and the type of water body in which it is found. The concentration is usually greater in larger, older fish, such as tuna, walleye, largemouth bass and northern pike, and in fish-eating fish like shark, swordfish and marlin.


Mercury content is not reduced by processing techniques such as canning, freezing or cooking.

Now, researchers from the University of Burgos have created

a fluorescent polymer, JG25, which can detect the presence of both forms of mercury in fish samples.

"The polymer remains in contact with samples extracted directly from the fish for around 20 minutes. Then, while being irradiated with ultraviolet light, it emits a bluish light, which varies in intensity proportionally to the quantity of methylmercury and inorganic mercury present in the fish," explained Tomás Torroba, lead author of the paper, which has been published in the journal *Chemical Communications*.

A portable polymer probe, which can be used in situ, was used to apply the technique to 2 g samples from a range of fish species. The qualitative relationship between the mercury levels in fish and the increased fluorescence was verified using chemical analysis using ICP-mass spectroscopy.

The research showed that the larger the fish, the higher the levels of mercury: between 1–2 ppm for swordfish, tuna and dogfish, around 0.5 ppm in conger eels and 0.2 ppm in panga. No mercury was found in farmed salmon. These are large fish at the top of the food chain, but the metal is not present in captivity due to the lack of an industrial or natural source. 



# packaging



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## Food Trays

With the growth of the ready meal market within Australia, DFC Packaging has set its course to become a major supplier to many of the manufacturers within this part of the food industry. With the growth of the dual ovenable smooth wall aluminium trays within this category, our customers are seeing us as a viable and forward moving supplier. We offer a wide range of lidding films to suit most tray types and can generally offer positive solutions off the shelf to our customers.

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DFC Packaging has also expanded its range of machinery and are now able to supply tray-sealing equipment to support our lidding films and trays as a one-stop shop. This machinery is already market proven and we have several machines already installed and running successfully with key market suppliers. We can also offer VFFS, HFFS, checking weighing and metal detecting units as well as a full range of shrink film systems. Also talk to us about our wide range of material handling equipment.

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DFC Packaging supply printed, plain and pre-form shrink sleeves for many different applications.

Printed shrink sleeves provide a 360° decorative labelling opportunity, thereby offering greater shelf presence. Shrink sleeves can be provided in different substrates, including PET, PVC and OPS. Plain and pre-form shrink sleeves provide a level of tamper evidence and can be perforated for ease of removal by the consumer.

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# Inaugural PIDA award winners



The winners of the 2017 Packaging & Processing Innovation and Design Awards have been announced at a gala dinner held at the Novotel Sydney Olympic Park.

**D**eveloped by the Australian Institute of Packaging (AIP), the Australian Packaging & Processing Machinery Association (APPMMA) and the Packaging Council of New Zealand, the inaugural PIDA awards for Australia and New Zealand have been designed to recognise companies and individuals who are making a significant difference in their field. And the winners are...

## 2017 Design Innovation of the Year Award — Health, Beauty & Wellness

### Materials & Packaging Winner

**Nestlé Health Science Australia and qDesign Enterprises for Nestlé Health Science Resource ThickenUp Hydration range with Innovative Sipper Lid.** The project team engaged Arthritis Australia, speech pathologists and dietitians to assist on concept design to ensure the packaging meets consumers' poor dexterity needs. In addition, the sipper lid has a specially designed cap to control flow and delivery of fluid, an easy-to-hold ridge and a tilted spout.



### Machinery/Equipment Winner

**HMPS for the HMPS6000 End Load Cartoner.** HMPS designed a highly flexible packaging machine capable of packaging personal care products of different sizes, varying shapes and weights into a variety of case sizes in various configurations, at high speed with maximum productivity output.

## 2017 Design Innovation of the Year Award — Beverage Category

### Materials & Packaging Winner

**CHEP Australia for CHEP Retail Display Pallets (RDP) and Beverage Trays (BT).** RDP and BT provide an alternative merchandising solution for the beverage category. A fully stocked RDP can hold 240 bottles of 1.25 L soft drink and replaces the 20 cardboard cartons that would normally be required to move them through the supply chain. The RDP can be filled at the manufacturer and then be moved right through to the shop floor and used to display the product. The top of the tray of the CHEP BT grips the base of the soft drink bottle while the underside includes moulding that encompasses the caps of the bottles beneath it. This system provides stability that allows the fully loaded RDP to move throughout the supply chain.

### Machinery/Equipment Winner

**Intralox for ARB Technology.** Intralox's Activated Roller Belt technology brings the benefits of modular plastic belting to complex package handling processes like sorting, merging and aligning.

## 2017 Design Innovation of the Year Award — Food Category

### Materials & Packaging Winner

**Australian Wholefoods for Levodo Grain Thin Crackers.** The Levodo clear plastic packaging is an innovative design for the healthy biscuit category, which is traditionally dominated by cardboard boxes or plastic sleeves. The design is beneficial to product shelf life once the tamper-proof seal has been broken, and the tube can be used as a storage container for the remaining crackers. The branding is not destroyed when the pack is opened like traditional flow-wrapped products.



## 2017 Sustainable Packaging & Processing Award

### Materials & Packaging — Transport Winner

**Woolpack Australia for Woolcool.** Woolcool is made of 100% sheep's wool, a renewable resource that is biodegradable, sustainable, natural and compostable. This is 'waste' wool that cannot be used in fashion or in textiles/carpet because it is too coarse, it does not produce a comfortable garment and it won't absorb dye. This wool has been used for housing insulation products and is now in this innovative packaging solution for transporting temperature-sensitive goods.



## Materials & Packaging — Retail Primary Packaging Joint Winners

**Plantic Technologies for the PLANTIC R Packaging Material.** Plantic Technologies' ultrahigh-barrier bioplastic material is manufactured using modern technology where thin layers of PET are adhered to a core layer of renewably sourced, ultrahigh-barrier PLANTIC HP sheet. The PLANTIC HP core provides an exceptional gas barrier and the PET provides a moisture/water vapour barrier to the structure. The material is versatile and suitable to most thermoforming and tray-sealing applications.

**Pact Group for the rPET Moisturelock Meat Tray.** Pact Group's rPET (Recycled Polyethylene Terephthalate) Moisturelock Tray is a suitable alternative to the hard-to-dispose-of expanded polystyrene (EPS) meat trays. The tray comprises 50% recycled material and is accepted by every kerbside recycling scheme. The 'dimples' in the base of the tray hold fluid even when tilted or turned upside down, and the labour efficiencies achieved through removing the soaker pad equate to approximately 70,000 hours for the meat processor.

Pact Group was also awarded the custom EcodEX packaging environmental assessment, valued at \$10,000. Empauer will implement its acclaimed EcodEX assessment and provide the winner with a reputable third-party environmental evaluation of the product package or formulation.







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### Machinery Equipment Category

#### Machinery/Equipment Winner

**Heat and Control for E-FLO.** The E-FLO allows producers to develop a healthier product for their customers by lowering the amount of acrylamide in potato products. The E-FLO uses pulse electric field (PEF) processing, or electroporation, to perforate the cell walls of potatoes, creating micro holes that allow asparagine and reducing sugars to be washed out of the potato in a cold water wash.



#### Machinery/Equipment Winner

**Omni for the Omni Pallet Wrapping Solution.** The Omni Stretch and Pallet Wrappers have the ability to reduce the amount of film used to wrap a pallet by up to 70%, resulting in substantial benefits to the environment. Using nanotechnology, the multilayer Omni Stretch Films allow users to wrap more pallets with less film.



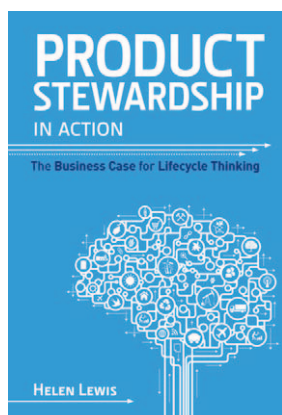
### 2017 Save Food Packaging & Processing Award Winner

**Fresh Technologies Ltd and Sealed Air Food Care for Freshness and Cryovac Freshness Plus.** The combination of Fresh Technologies' Cold High Pressure Processing (CHPP) and Cryovac Freshness Plus Active Barrier packaging has enabled Fresh Technologies to achieve a chilled shelf life of 90 days, a 60-day extension over existing passive high-barrier packaging technology. The CHPP recovers 100% of avocado flesh, leaving only the skin and seed.

Other winners announced on the night included the 2017 Industry Packaging & Processing Professional of the Year Award, which was jointly awarded to Paul Haberland FAIP, packaging manager, Nestlé Australia and Lester Nichol, managing director, Matthews Australasia. The 2017 APPMA Scholarship was awarded to Michael Van Dord, technical and design engineer, Caps and Closures. The 2017 Young Packaging & Processing Professional of the Year Award joint winners were Alexandra Brayshaw MAIP, accessible packaging researcher, Arthritis Australia and Nina Cleeve-Edwards MAIP, manager – Oceania Innovation Acceleration Team, Nestlé Australia.

The Packaging & Processing Innovation and Design Awards (PIDA) are the exclusive entry point for Australia and New Zealand for the prestigious WordStar Awards.

**Australian Institute of Packaging**  
[www.aipack.com.au](http://www.aipack.com.au)



### New book examines product stewardship in action

Product stewardship, often referred to as 'extended producer responsibility', or EPR, is the idea that everyone that benefits commercially from a product, including manufacturers, distributors and retailers, has a shared responsibility to minimise its environmental impacts.

A new book available from the Australian Institute of Packaging (AIP) examines how and why leading companies are taking responsibility for the environmental impact of their products and packaging.

Written by Dr Helen Lewis, who is a Fellow of the AIP, *Product Stewardship in Action: The Business Case for Lifecycle*, draws on the knowledge and experience of industry practitioners and other experts to provide a structured approach to product responsibility within firms. The book assists those new to the field, as well as more experienced practitioners, to develop an effective response to stakeholder concerns about the environmental impacts of their products and packaging.

The book is now available from the AIP Bookstore.



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## Vacuum supply for food packaging

Busch Vacuum Pumps' R 5 RD vacuum pumps require 20% less motor power than comparable models, according to the company.

Designed for the vacuum packaging of foodstuffs, the pumps can be easily cleaned because the surfaces are smooth, the oil lines are only on the inside and the housing has no cooling fins. Maintenance has been reduced as all of the maintenance elements are attached to an operating side, and only one single air/oil separator must be changed.

An oil/water heat exchanger on the rotary vane vacuum pump can reduce waste heat and thus reduce the energy costs for air conditioning. Furthermore, the heat exchanger can be used to generate warm water, which can in turn be used as warm water during operation. The vacuum pumps can be retrofitted with heat exchangers.

Packaging processes can be designed more economically through the use of intelligent technologies for the vacuum supply — from an optimised control system, to frequency control, to the use of a vacuum container.

Centralised vacuum systems are suitable for companies that package foodstuffs on several thermoforming packaging machines, tray sealers or chamber machines. Centralisation can reduce energy costs by 50% or more because fewer vacuum pumps are required. Performance control can also be adjusted to fit the requirements of overall operations. Safety is enhanced because if a vacuum pump fails or needs maintenance work, full vacuum power remains intact.

**Busch Australia Pty Ltd**

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

## White ink for dark bottles

Markem-Imaje has launched MW470, a white ink suitable for the beer, cola and fruit juice sectors. Legible, resistant and washable, the ink can be used to code non-returnable and returnable dark glass bottles.

The opacity of the ink delivers the contrast required for legibility of codes printed on amber and coloured glass bottles. The white colour blends harmoniously with bottle decors.

The ink adheres to glass but can be easily removed in washers using low soda concentrations. The ink is also resistant to pasteurisation and can code returnable bottles that have undergone scratch prevention treatments such as Tegoglas and Opticoat.

The ink is also suitable for PET bottles, aluminium cans, metal and PE drums, bottle racks, removable films and cardboard packs. Used in combination with Markem-Imaje's 9450S inkjet printer, the ink can code up to 120,000 products/hour.

**Markem-Imaje Pty Ltd**

[www.markem-imaje.com](http://www.markem-imaje.com)



## Hygienic FFS PE packing line

BEHN + BATES's Roto-Packer Adams CARE-LINE Edition is an ultrahygienic form fill seal (FFS) polyethylene (PE) packing concept.

Suitable for highly sensitive powder-type products such as baby food, the packing technology not only fills powders into common PE film bags but also double-layer PE film bags for optimal product protection.

The line features machine components that have been combined in a system to minimise areas where dust can collect, ensuring optimum cleaning. There are no open threads, edges or drill holes in the sectional steel frame, removing any points where product dust can build up. The inclined edges and rounded corners allow for easy dust removal.

The number of integrated components has been reduced to the minimum needed for proper functioning and all parts are encased. There are virtually no machine parts such as screws or nuts that could fall into the product during filling.

The line makes it possible to seal PE film bags up to the outer edge, producing good edge definition to protect the products in the filled bag from vermin, dirt and deterioration.

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# Food-safe packaging print

## A look at ultraviolet/electron beam (UV/EB) ink curing.

*Ann Hirst-Smith*

**Food-safe packaging print remains a prime concern for product manufacturers and retailers, as well as form packaging suppliers and converters. It is a complex topic, involving, as it does, a broad regulatory base; a diverse array of packaging substrates; the many available choices of printing/imaging technologies and the inks and varnishes that they employ in delivering on-pack branding and labelling. Their integrity must be retained at every level of the production and packaging chain — to ensure that the consumer can safely enjoy the product.**


**R**adTech Europe, the association promoting the advancement of radiation curing by UV, EB and laser beam, has for several years been active in the food-safe packaging print arena. At its 2016 convention the association brought together a major tranche of the relevant value chain for an in-depth seminar on the current and future use of UV and EB ink curing in this key packaging print market.

Charles Bourrouse of Sartomer, part of Arkema Group, global suppliers of specialty acrylates and methacrylates, presented a broad overview of the applied chemistries inherent in printing and packaging materials, highlighting trends for new developments in low-migration inks. Today's state-of-the-art radiation curing systems, he said, still represent a very small percentage of the total market, though lamp price reductions are encouraging uptake in both analog flexo and offset print. However, Bourrouse showed that a number of practical challenges still remain at every level of ink chemistry to ensure total elimination of set-off and migration, and he mapped out 'next steps' and development opportunities.

### Food packaging market data

Dominic Cakebread, Packaging Consultant for market researchers Smithers Pira, expanded on the topic of food packaging market usage of radiation curing. After all, he said, food and beverage packaging together make up two-thirds of the consumer packaging market, and continue to show robust growth globally. He identified the current megatrends that are driving today's packaging world. Top of the list was lightweighting, which affects nearly all packaging materials. Next came format substitution — particularly in relation to flexible pouches — and, of course, sustainability concerns. A 2016 Smithers Pira research survey indicates, he said, that 96% of brand owners consider sustainability to be important for their business. He delved into the profile of radiation curing by print process, and said its overall market share is forecast to grow at a healthy CAGR of 4.1% to 2019, with cartons and labels the largest markets. He highlighted the relevant key advantages of UV/EB curing: instant ink cure with minimal dot gain; a high-gloss, vibrant finish for the printed image; the ability to tailor cured ink to special requirements such as chemical or





abrasion resistance; and the environmental benefits — no VOCs or solvents, for example — along with the possibility of low-migration inks.

Cakebread went on to identify the barriers to radiation curing for packaging — particularly food contamination issues — and listed future drivers for the technology, which must include improvements in the efficiency and efficacy of the supply chain, to deliver product safely for the consumer at the lowest possible cost. However, the final influence on the growth of the technology in packaging applications is the future outlook for the packaging market itself. He profiled likely scenarios in regional markets around the world, concluding that “the balance of power will continue to move to the developing regions”, and reiterated that, in today’s competitive retail arena, packaging producers will face “unrelenting pressure to innovate and improve performance — at lower cost”.

### **Nestlé: a leading brand owner’s perspective**

With an overall brief to manage a multidisciplinary approach to food packaging safety within Nestlé’s extensive product portfolio, Dr Amaury Patin from Nestlé’s Swiss research centre enlightened seminar participants on Nestlé’s perspective. With a €7 billion annual spend on packaging, and 64,000 individual packaging specifications, the need for in-depth analysis and control of quality — both quantitative (eg, in migration) and qualitative (in respect of compliance with established standards and regulations) — is, he said, paramount. Dr Patin and his team are currently researching a completely new approach to these testing procedures. He explained the complex ‘recipe’ ingredients that constitute packaging per se, and went on to show how migration can occur, both directly through the substrate to the contents, and via ink or varnish set-off from the printed packaging surface to the unprinted (food contact) side during pre-fill storage.

Nestlé is known for its dedication to consumer wellbeing, and in relation to printing inks, maintains the standards of the Swiss Ordinance — currently the most comprehensive legislation — and the company’s own highly regarded Guidance Note on Packaging Print, of which a new update has recently been published. His overarching message to seminar participants was that “it is in the interests of all partners in the packaging value chain to have a full knowledge of the products they deliver”; and he urged suppliers to “think like a food company”.

### **Legal and compliance requirements**

Rachida Semail, a Partner in Keller & Heckman, legal practitioners with a specialism in food law, summarised the scope and practical data requirements in the German and Swiss Ordinances, highlighted the differences between them in relation to printing inks, and explained the implications and ongoing complexities of implementation and compliance. She also examined other potentially relevant legal initiatives such as the draft EU BPA Regulation, providing a remarkable overview of an evolving legislative base that is complicated by supply-chain sectors, which are unsurprisingly active in lobbying for their own special interests.

This was a topic with implications for all seminar participants, and moderator Paul Kelly brought together Perrine Cahen of Allnex, Nick Ivory of Sun Chemical and EuPIA, Rachida Semail of Keller & Heckman, and Amaury Patin of Nestlé to debate the issues along with the audience. It was evident that the packaging print supply chain members are, indeed, very aware of the need to be proactive in meeting their respective responsibilities. Printing inks legislation, all agreed, can be useful, particularly in protecting the consumer — but today’s legislative base is a maze, and there is still currently little likelihood of establishing one complete, overarching international standard.

### **Inks and varnishes**

EuPIA, the European Printing Inks Association, is a long-time promoter of good manufacturing practice with inks, and is an active participant in guidance on their use on food contact materials. Nick Ivory, EuPIA Chairman and Technical Director of Sun Chemicals, provided a helpful update on the association’s positive contribution to the debate — and to managing its outcome. EuPIA’s latest, highly detailed GMP guidance document, published in March specifically by and for the ink

“Taking care of the right ink selection together with knowledge of the process, the correct settings and control of the parameters guarantees the fulfilment of food law requirements and safe usage of UV-cured inks and varnishes on food packaging.”



industry, aims to assist in controlling food-safety hazards in the design and manufacture of inks, varnishes and coatings to be used on food-contact materials, both on the food-contact surfaces and non-food-contact surfaces of such materials. The stand-alone document is, said Ivory, “a road map for the process of continuous improvement”, and makes provision for regular audits by brand owners and packaging converters, delivering a high level of transparency at all levels. All EuPIA members are expected to adopt it, and may additionally wish to comply with the more generic International Food Standard-accredited standards such as BRC IOP or ISO22002-4.

### Low-migration inkjet inks

Dr Marc Graindourze, Agfa Graphics’ Business Development Manager for industrial inkjet inks, expanded on the role of low-migration inkjet ink technology in indirect print applications on food packaging. Here, a safe imaging process involves, he said, the “combination and control of all parts of the print solution” — substrate, low-migration UV-curable inkjet ink, the printing and processing environments, and the food storage and processing conditions. “Each application has its own very specific risks,” he underlined — for example, print on aluminium blister packs, self-adhesive labels, sleeve labels and direct-to-container print. Dr Graindourze explored the chemistry of creating low-migration UV-cured inks at low viscosity. Particularly with inkjet and flexo print, he said, this is a key element for success, and Agfa Graphics is currently working on a conceptual low-migration, low-viscosity inkjet ink design solution.

### ECMA’s agenda

It was the turn of the packaging industry to address the seminar, and Pieter Geers from the Technical Committee of the European Carton Makers Association, ECMA, addressed a thought-provoking agenda. ECMA’s Good Manufacturing Practice Guide underlines the plurality of the central carton packaging concept, and, as Geers reminded the audience: “If you are a printer, you are not making a generic product. Every print job is different.” Outlining the wide array of ‘hard’

and ‘soft’ legislation that pertains, he went on to examine the many different practical elements in an item of packaging, including afterlife uses, and the combination of boards, adhesives, inks and coatings that make up a finished carton. He also showed how, in industry tests to the EN1186-13 standard, the ink migration factor differs by carton substrate type — even between virgin and recycled pulp content. In the production environment, it is essential, he said, to control all the physical hazards such as the ingress of drawing pins, glass shards, insects, etc, as well as the chemical hazards of inks and such factors as machine operators’ perfumes — a plethora of possible contaminants, as he showed.

### Optimising the print process

Optimising the safe usage of UV-cured inks on food packaging, with particular reference to UV flexo, was the topic addressed by Werner Veit, from the Research and Development Department of Constantia Teich. He examined the benefits and limitations of UV flexo as a print process and identified the variety of packaging substrates that employ it, from lacquered aluminium for dairy, pharmaceutical and petfood applications to PET and PET/paper/PET lidding laminates, paper/aluminium/PET for soup pouches and plain paper banderoles. Following a summary of food law requirements and the necessary declarations of compliance along the supply chain, Veit went on to detail the optimisation of the UV flexo process to achieve the desired results. His very detailed exploration included a ‘worst case’ investigation, as well as a pressroom testing and maintenance routine to ensure process reliability and compliance in food packaging conversion. As he concluded, “Taking care of the right ink selection together with knowledge of the process, the correct settings and control of the parameters guarantees the fulfilment of food law requirements and safe usage of UV-cured inks and varnishes on food packaging.”

RadTech Conference & Exhibition 2017 will take place in Prague on 17–19 October 2017. Visit [www.radtech2017.com](http://www.radtech2017.com) for more information. 



## Industrial inkjet colour label printer

Brady has released the BradyJet J5000 Colour Label Printer, an industrial inkjet printer that creates photo-quality colour labels for indoor use in a single pass, while reducing label supply inventory and waste.

The printer is an on-demand labelling solution for full colour labels that include photos, graphics, logos, text, barcodes, etc.

Featuring up to 4800 dpi print resolution and 16 million colour possibilities for clarity and fine detail, the printer operates at speeds up to 152 mm/s, allowing users to print 5000 labels/day.

The large, separate ink cartridges for each colour of ink optimise materials and allow individual replacement. The indoor vinyl and polyester label materials have a specially formulated topcoat to enhance colour and label appearance, and protect from smudging and harsh conditions.

The inkjet printer produces 50–203 mm-wide labels on continuous and die-cut label materials that are suitable for a variety of applications, including safety signage, GHS labels, lockout labels with photos, department signage, asset management, lean/5S visuals, pipe markers, facility signage and more. The printer uses Brady Workstation label app software for simple label creation.

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## Thermoformed in-mould labelled containers make their debut



Vibrant 360° illustrations that cover the container wall all the way up to the sealing rim are now a reality following a collaboration between Coveris and Finnish dairy producer Valio.

The thermoformed in-mould labelled (TIML) containers which feature a sophisticated combination of forming and label positioning can even include photorealistic illustrations.

Coveris initiated the TIML development over three years ago, with Valio later coming on board and lending expertise. With innovation in both design and decoration, the new container is the first of its kind.

This technology introduces many benefits for future container production, such as up to a 20% decrease in weight by using foamed, lightweight multilayer sheets, such as NEOCELL or NEOCELL+ with a gas-injected middle layer and optional filler materials. Low levels of waste and operating temperatures are ensured when applying Coveris's in-mould labels, achieving an improved carbon footprint. Furthermore, various label types are available, including PP, PS, hot melt paper, 'coated' paper and recyclable paper. This decoration is highly visible, stands out on the shelf and will attract the attention of consumers.

The TIML technology provides a new decoration option that differentiates itself from the competition, oxygen barriers that increase shelf life and 100% UV barriers that allow preservation of the organoleptic properties of high-fat products. The container provides an alternative to both aluminium and glass packaging.

**Coveris Australasia**  
www.coveris.com



## Continuous inkjet printer

The Domino Ax-Series continuous inkjet printer combines speed, accuracy and the ability to withstand the most demanding industrial packaging environments. Combining over 30 years of continuous inkjet knowledge, the company has introduced a new generation of CIJ technology.

A multinational team of scientists and engineers from 22 countries have rewritten the rules of coding and marking, by revisiting the underlining science behind CIJ and introducing innovations in three key areas.

These three 'pillars' of innovation are incorporated into the Ax-Series: the i-Pulse print head and inks; the i-Techx electronics and software platform; and Domino Design, a fresh approach to the total product design to maximise productivity and ease of operation.

The i-Pulse print head provides optimised print quality and readability from the first drop to the 1000th drop. This system is designed to deliver higher resolution text and 2D codes than previous CIJ models and advanced droplet accuracy, allowing rapid high-contrast multiple line messages to be produced at the fastest possible speeds.

Designed from the ground up to be Industry 4.0 ready, the Ax-Series is designed for the factory of the future. High-speed electronics enables serialisation and other unique item coding applications on the fastest production lines.

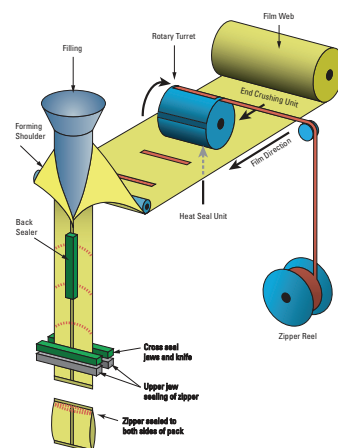
Focusing on the user experience, Domino design focuses on creating a robust and reliable system that minimises operator invention and encourages tool-free operator maintenance, measurably reducing cost of ownership.

[Click here to find out more.](#)

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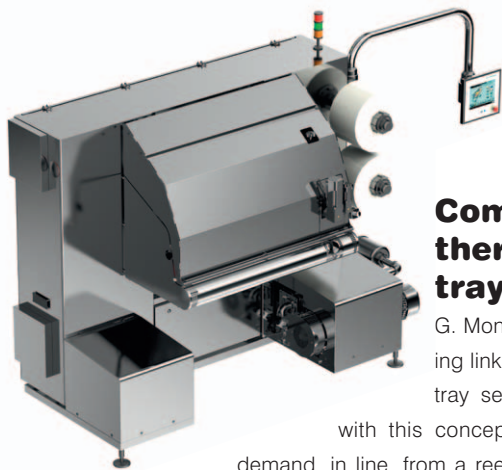
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## Combination thermoformer/tray sealer

G. Mondini's Platformer is the missing link between thermoforming and tray sealing lines in packaging as with this concept users can form trays on demand, in line, from a reel.

Packaging lines today are either divided into thermoforming for value packs or tray sealing for higher quality packs. Combining the Trave tray sealer technology with the Platformer technology allows manufacturers to use one machine to switch between thermoforming and tray sealing.

The new technology revolutionises the concept of tray forming by cutting the tray footprint before the forming process occurs, reducing scrap waste to just 1%. The innovative use of a Trave and Platformer together means the tray format can be changed in less than 10 min with only the change of 2 components, at a fraction of a cost of a standard thermoformer.

The combined technology delivers the ultimate packaging line, driving down cost and extending pack tying.

Whether using trays made inline or pre-made, the line is designed in such a way the product can be filled either automatically or using skilled staff.

### Select Equip

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

## Dry lubrication kit

Tetra Pak's dry lubrication kit for packaging line conveyor belts and distribution equipment helps users cut water and electricity consumption, and reduce the man-hours required for machine maintenance.

Traditional conveyor lubrication, known as wet lubrication, uses high quantities of water mixed with oil, leaving both the equipment and factory floor wet. The dry lubrication kit does not require the use of water but just very small quantities of oil. A drop of food-grade oil roughly the size of a pea (80 mm<sup>3</sup>) is directly added to the conveyor belt to reduce its friction with the package.

Compared with wet lubrication, the lubrication process provides an improved environmental footprint, saving an average of 35,000 L of water per filling line each year and reducing electricity costs. The fully automated system ensures precision, while producing a 75% reduction in man-hours for maintenance, and improved health and safety for staff on the operation floor.

The system reduces running costs by an estimated 50%, according to the company.

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## Question time ...



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### Is X-ray better than a metal detector?

Whether you use X-ray or metal detection to detect any foreign contaminants in your products depends on your application. This quick Q&A explains.

**Q. What are their strengths?**

A. X-ray systems detect metals and other solids (glass, stones and bones), while today's advanced metal detection systems detect metal and non-ferrous metals. X-ray systems generally find smaller contaminants in a wider range of materials, including large packaged products, cases, cans and bottles.

**Q. What are their challenges?**

A. Because they're conductive, metal detection systems struggle with wet and salty products, while X-ray systems struggle with textured, dense products. However, advanced systems can overcome both these issues.

**Q. Does packaging type make a difference?**

A. Yes. Metallised film and foil-based packaging enhances products' appearance and/or shelf life, but often rules out metal detectors; however, X-ray inspection systems can see right through these to detect extremely small foreign objects. So take into account all the packaging material, to determine the best investment.

**Q. Does it matter where the unit sits on the line?**

A. The "optimum detection point" in your processing line is the spot with the greatest chance of finding contaminants, and influences which technology to use. Metal detectors can be installed nearly anywhere, but their design means they work best for small packages and bulk-conveyed products. By contrast, X-ray systems have greater sensitivity in a wider range of products. In both cases, it's often best to put the unit at the end of the line, examining finished packaged products.

**Q. Does speed matter?**

A. Yes. X-ray systems need a constant, known speed to construct images, so don't work in gravity-flow applications. But metal detection can be used almost anywhere. Multiple products can be run through an X-ray at a time, while it is ideal to run one product at a time in a metal detector.

**Q. What else can the technology do?**

A. Always think about getting the most value: what else can the system do besides detect contaminants? E.g.: X-ray can detect missing products in a pack, or inspect a product by measuring the shape, counting objects or use image density to estimate weight. Because so many different factors affect performance, speak to an expert on configurations to meet your requirements.

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### Stand-up pouch range

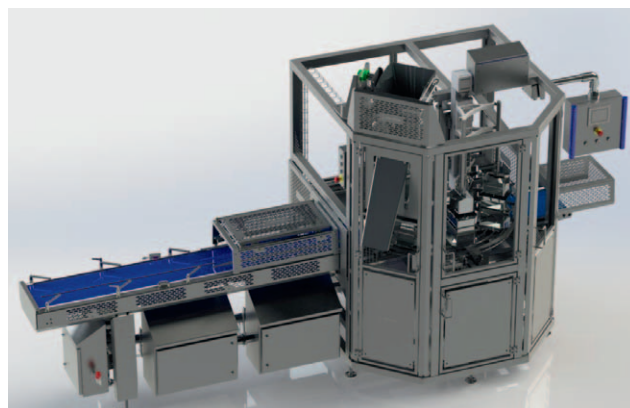
Clondalkin Flexible Packaging Bury has introduced stand-up pouches to its flexible packaging product portfolio.

The range includes retortable, microwaveable and non-retortable stand-up pouch packaging suitable for food and beverage, dairy, home and personal care.

The pouches are available in different shapes and sizes. Features include: laser perforation for easy opening; mechanical reclose, such as Velcro zippers; handle grips for easy handling; and modified atmosphere packaging (MAP) technology for extended product shelf life.

**Chadwicks**

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### Rotary salad filler

The Ishida Rotary Salad Filler is an automatic, high-speed solution for filling trays with salad products.

Packing salad into trays is challenging due to the fact that salad leaf has a free-flowing volume that can be up to three times the volume of the tray, which means the leaf does not naturally fit into the confines of the tray and easily spills over.

The Rotary Salad Filler automatically fills salad into preformed trays at high speeds up to 50 trays/min per lane on all pack formats, with minimum spillage.

The filler accepts preformed trays, which can be fed by hand or via an automatic denesting system. The filler then fills the tray via a combination weigher and tamps (settles) the product twice to ensure it is fully in the tray. Trays are then lowered at the exit of the machine to ensure all product remains in the tray.

The machine has been designed for market tray sizes from 140–450 g. Trays can be narrow or wide edge leading and the process is suitable for tray sealing, ultrasonic sealing or shrink banding.

**Heat and Control Pty Ltd**

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



## Improved efficiency for beverage producers

Sidel's ECO Booster is a service to help beverage producers improve sustainability by reducing the consumption of materials, electricity and compressed air.

The ECO Booster portfolio comprises five modules. The ECO Audit is first performed on the blower to analyse production conditions and energy consumption. The ECO Process module provides calculated adjustments and process improvements, proposing specific upgrades. The ECO Heating module optimises the heating profile with less installed power: options such as the ECO Oven, ECO Lamps and ECO Oven Top Reflectors optimise the blower heating performance to achieve up to a 45% electrical consumption reduction. The ECO Air module reduces electricity consumption via an Air Recovery Kit, leveraging on re-use of up to 40% compressed air during production.

The ECO Packaging solutions enable producers to transform the shape of their packaging while improving its performance and safety. Beverage customers can reduce the use of PET resin by reducing the neck height, for example.

Bottles designed following the Sidel RightWeight concept can offer improved performance and reductions in material costs, while the implementation of the Sidel StarLite will enable a reduction in air-blowing pressure yet increase the resistance of the base and stability of the bottle.

Weighing 7.95 g, the 0.5 L concept bottle is around 34% lighter than the average commercial bottle for still water and demonstrates a top load performance of 33 kg, according to the company. The bottles achieve this rigidity without the use of nitrogen dosing.

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foodpro 2017

# A CLOSER LOOK

at the food industry

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International Convention Centre,  
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# Why you need to attend foodpro 2017



*Armfield FT74XTS modular miniature scale UHT/HTST process systems.*

Demonstrating its ongoing relevance to the food and beverage processing industry, foodpro 2017 was completely sold out more than three months before the event's opening. More than 340 local, national and international companies have committed to the event, meaning that visitors will be able to see the widest range of equipment and services relevant to all aspects of the food and beverage manufacturing industry including meat and seafood, value-add processing, beverages, dairy, fresh food and shelf foods — all in one place.

**T**his year's event is an auspicious occasion celebrating the 50th anniversary of the iconic food manufacturing event. foodpro continues to serve all sectors of the food manufacturing industry through unique opportunities to connect, network and do business across the four-day event. The sold out show floor is just one part of a highly anticipated show. Other highlights include the new Security Chain Integrity Zone, providing end-to-end solutions for small manufacturers on traceability; the Food Authority of NSW will be presenting a seminar on labelling compliance and the law; and, of course, the co-location with AIFST is always a highlight.

foodpro 2017 will feature four key precincts: food processing technology; food packaging; plant equipment; and food technology. Access to new trends will be a priority as well as insight into key issues facing the industry such as traceability, food safety and sustainability.

## **A tour of the foodpro exhibition will include food laboratory and test equipment:**

Emona Instruments (Stand Y30 on Level 1), who will be bringing the brand Armfield to the show, specifically to showcase the modular miniature-scale UHT/HTST process systems. The FT174X and FT74X are products designed to improve food research and new product development for process systems at a small scale. The FT174X is a modular HTST/UHT processing system designed to treat products at flow rates of 12-40 L/h or up to 60 L/h for water (or similar low-viscosity products). This reduces the amount of product/raw materials, time, energy and wastage involved in the process of developing a new product.

foodpro will also feature the Delta Lactoscope FTIR, a state-of-the-art instrument that uses modern FTIR optics, presented by Perten Instruments (Stand W53 on Level 1). The instrument uses a method that is AOAC and IDF approved for the analysis of lactose, protein, fat and total solids in milk as well as testing other products such as whey, yoghurt and cream. The versatility of this instrument is second to none, with an efficient flow system and unnecessary valves and pumps removed; the instrument is easier to operate, requires less maintenance and has longer calibration intervals.

The Perten Instruments stand will also showcase the NIR DA7250, which has been certified by AUS-MEAT. It has an IP65 certified enclosure and uses open-faced cup scanning, making it suitable for the analysis of raw and cooked smallgoods, patty production and raw meat. The instrument is used for the inspection of incoming meat, monitoring production of ground meat, optimising sausage recipes and much more.

foodpro 2017 will see the launch of other exciting new forms of technology and product from other leading exhibitors such as Krohne, Brenntag, Fusion Australia, Inspection Systems and more. Along with offering visitors the unique opportunity to see the new equipment and solutions for themselves, the opportunity to network and learn more from peers in the industry makes foodpro a truly unmissable event.



# Are you ready for foodpro's new venue?

16–19  
JULY 2017

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DARLING HARBOUR



**T**his July 16–19 will see foodpro held for the first time at the International Convention Centre (ICC), Darling Harbour, Sydney.

Sitting at the heart of a broader AU\$3.4 billion revitalisation of Darling Harbour, ICC Sydney is a AU\$1.5 billion development that will adjoin a new circa 600-room luxury hotel, a new residential and commercial development, a new pedestrian boulevard that will connect the waterfront back to Central Station and laneways.

ICC Sydney's exhibition space is split over two floors and so when you visit foodpro you will need to ensure you visit both.

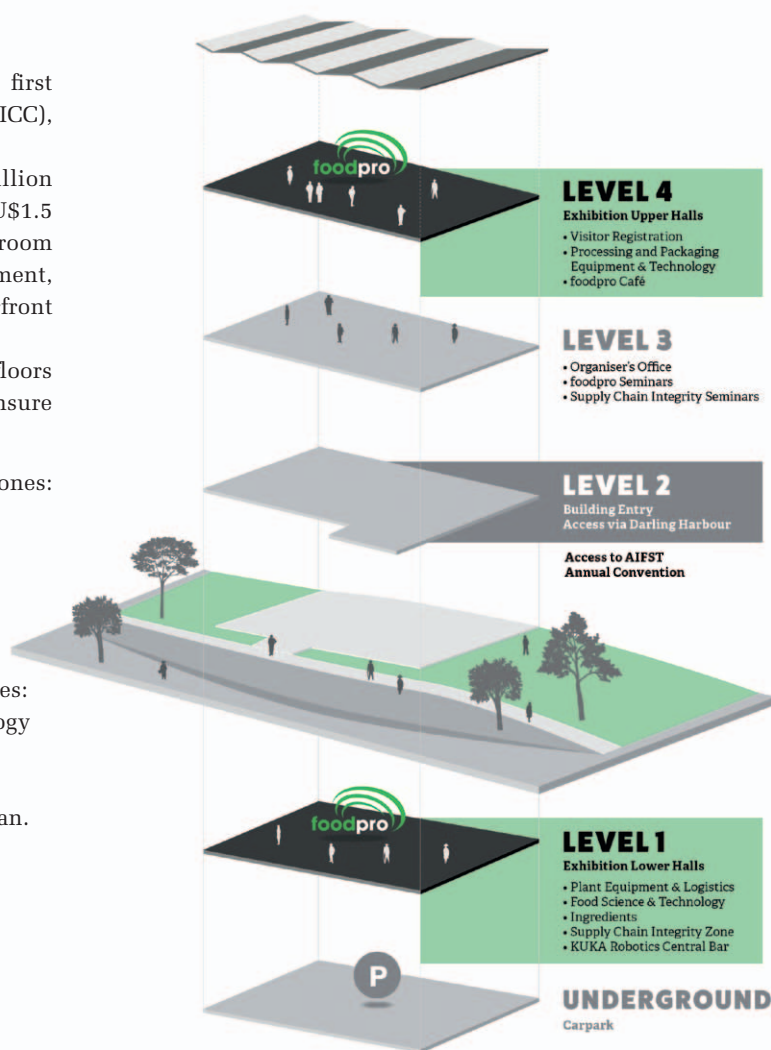
Level 1 (Lower Exhibition Hall) will include these zones:

- Plant equipment and logistics
- Food science and technology
- Ingredients
- Supply chain integrity zone
- Central bar

Level 4 (Upper Exhibition Hall) includes these zones:

- Processing and packaging equipment and technology
- Cafe
- Visitor registration

For more information, visit [foodproexh.com/floorplan](http://foodproexh.com/floorplan).







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FOOD PROCESSING**



## Look who's exhibiting at foodpro

Company Name	Stand No.	Venue Level
3M	W42	Level 1
A & D Weighing	U45	Level 1
AAAT - DST Dryers	P53	Level 1
ABB Australia	Q34	Level 1
AccuWeigh AccuPak	O34	Level 1
ACO Polycrete	R15	Level 1
Adm Australia	X16	Level 1
Aerofloat	P12	Level 1
Agilent Technologies Australia	Y52	Level 1
Aglive Group	SC8	Level 1
Agrifood Technology	Y50	Level 1
AIFST & Food Australia	W46	Level 1
Air Liquide Australia	B62	Level 4
AKA Cleaning Machines	P51	Level 1
Alchemy Agencies	Y12	Level 1
All Pumps Sales & Service	U39	Level 1
ALS	W40	Level 1
Alsco	X29	Level 1
AMSL	W61	Level 1
Amyl Media	Y57	Level 1
APC Technology	P7	Level 1
Argus	A50	Level 4
Armfield - Emona Instruments	Y30	Level 1
Arrow Scientific	Y46	Level 1
Asafe Australasia	P57	Level 1
Assa Abloy Entrance Systems	R30	Level 1
Australian Botanical Products	X3	Level 1
Australian Vinegar	Y22	Level 1
Australian Wrapping Company	N51	Level 4
AustralWest	J61	Level 4
Axieo	W16	Level 1
B & B Food Pak	O30	Level 4
Barnco Sales	A36	Level 4
Barrier Pack Co	T52	Level 1
BASF Australia	W31	Level 1
Bastion Pacific	Y36	Level 1
Beijing Xinmei International Exhibition	T52, T58 & U61	Level 1
Biomérieux Australia	W54	Level 1
Bio-Rad Laboratories	X53	Level 1
biosteam	P37	Level 1
Biotec Solutions Aust	B60	Level 4
Biotech Laboratories	U41	Level 1
Biotechnic	P49	Level 1
Blucher Australia	W34	Level 1
BMP Doors Australia	S49	Level 1
BOC	A9	Level 4
Brendma (Australia)	A14	Level 4
Brenntag	U18	Level 1

Company Name	Stand No.	Venue Level
Bruker	Y60	Level 1
Bulk Handling Australia Group	O20	Level 4
Bunzl Food Processor Supplies	N61	Level 4
Burkert Fluid Control Systems	Q46	Level 1
CAPS Australia	P52	Level 1
Carmi Flavors and Fragrance	V16	Level 1
CBS Foodtech	C13	Level 4
CBS Foodtech	E14	Level 4
CBS Foodtech	U16	Level 1
Cell Biosciences	Y54	Level 1
Chadderton Food Safety	SC5	Level 1
Chart Industries	A47	Level 4
Chemiplas Australia	W24	Level 1
Chinese Chamber Of Commerce For Import & Export Of Medicines & Health Products	Y4	Level 1
Clear Facilities	R62	Level 1
CMC Technologies	P19	Level 1
Cold Logic	W29	Level 1
Coldshield	P46	Level 1
Columbit	E30	Level 4
Columbit Foods	U23	Level 1
Confoil	D35	Level 4
Connell Bros Company	X24	Level 1
Contech Engineering	L42	Level 4
Coolsan Australia	P9	Level 1
CPS	M48	Level 4
CRC Industries	R58	Level 1
Cromarty	P39	Level 1
Crown Company (Soya Protein & Collagen Casing)	T58	Level 1
csb-engineering-ag	O44	Level 4
CSIRO	X62	Level 1
CST Wastewater Solutions	S9	Level 1
Cuddon Freeze Dry	B50	Level 4
Dairy Industry Association of Australia	O36	Level 4
Dalsorb	T49	Level 1
Department of Industry, Innovation and Science	X52	Level 1
Devro	C3	Level 4
Donaldson Australasia	Y41	Level 4
DTS Food Laboratories	W58	Level 1
ECAS4	W50	Level 1
Eco Pallets	P1	Level 1
Edwards Group	X47	Level 1
ELISA Systems	Y40	Level 1
Elta Fans Applied Technology	Q52	Level 1
Emrich Industries	G55	Level 4
Emura Food Machine	O24	Level 4
Endress & Hauser	T9	Level 1

Company Name	Stand No.	Venue Level
Ennio International	E42	Level 4
Epson Australia	G63	Level 4
Eriez Magnetics	S11	Level 1
Euro Pumps Engineering	P33	Level 1
Evolve Scientific Recruitment	Y61	Level 1
Extreme Packaging Solutions	i55	Level 4
Fallsdell Machinery	D29	Level 4
FDPI Spares & Maintenance	Q16	Level 1
Fine Pack	D33	Level 4
Flavorjen	X20	Level 1
Fleming Chillers	P61	Level 1
Flexco	Q30	Level 1
Flexopack	N19	Level 4
Flick-Anticimex	P59	Level 1
Flowcrete Australia	Q42	Level 1
Fluid Dynamics	X34	Level 1
FMCG Industry Solutions	R56	Level 1
Focus Trading	L61	Level 4
Food & Beverage Industry News	Y10	Level 1
Food & Drink Business	X30	Level 1
Food Automation	J55	Level 4
Food Pro	K42	Level 4
Food Processing Equipment	i3	Level 4
Foodcare	R3	Level 1
Forbo Sieglings	L58	Level 4
Fuchs Lubricants	T45	Level 1
Fusion	Y29	Level 1
Gates Australia	A57	Level 4
GELITA Australia	V24	Level 1
Giura Group	C58	Level 4
Global Machinery & Supplies Australasia	C29	Level 4
Globus Group	E3	Level 4
Gold Peg International	L46	Level 4
Gordon Brothers Industries	P10	Level 1
Graintec Scientific	V62	Level 1
Hales Australia	P25	Level 1
Hanna Instruments	X41	Level 1
Hastings Data Loggers	R9	Level 1
Hawkins Watts	V4	Level 1
HBM Packaging Technologies	E23	Level 4
HB-Technik Asia Pacific	Y32	Level 1
Heat and Control	i41	Level 4





Company Name	Stand No.	Venue Level
HEPWORTHS	S45	Level 1
Highgate Group	A56	Level 4
Hipex	S29	Level 1
Honeywell	V46	Level 1
HRS Heat Exchangers	T16	Level 1
Hurl Nu-Way	T7	Level 1
Hychem International	P5	Level 1
Hydroflux Industrial	Q40	Level 1
Ibex Australia	Y34	Level 1
IFM EFECTOR	W30	Level 1
IMCD Australia	U3	Level 1
iMove	A47	Level 4
Informationleader.com	W35	Level 1
Ingredion ANZ	X4	Level 1
Innovative Meat Processing Equipment	A4	Level 4
Inox - Australia	S15	Level 1
Inpact Innovation	SC7	Level 1
Inspection Systems	i11	Level 4
INTERFIBRE LTD	U13	Level 1
Interfood Group	A29	Level 4
Intralox	i49	Level 4
ITW Zip-Pak Australia	B52	Level 4
Ixom	X10	Level 1

Company Name	Stand No.	Venue Level
J.L. Lennard	B42	Level 4
Jarvis ANZ	M17	Level 4
Jaymak Australia	V58	Level 1
JMP Engineering	E25	Level 4
John Bean Technologies	J22	Level 4
John Morris Group	X55	Level 1
John Thompson	P21	Level 1
Johnson Screens	R55	Level 1
Key Technology	E4	Level 4
Kiel Industries	P16	Level 1
Kockums Bulk Systems	E56	Level 4
Krohne	Y58	Level 1
KUKA Robotics Australia	P24	Level 1
Label Power	C62	Level 4
Lafert Electric Motors (Aust)	Y33	Level 1
Lagarde Autoclaves	D60	Level 4
Linco Food Systems	G49	Level 4
M.T.I. See thru	P4	Level 1
Machine Knives Australia	O40	Level 4
Major Engineering	T62	Level 1
Marel Australia	i19	Level 4
Matrix Process Solutions	R24	Level 1
Matthews Australasia	N23	Level 4

Company Name	Stand No.	Venue Level
McLaren Stainless	M29	Level 4
Meat Processing Services	C58	Level 4
Meat Processing Supplies	A42	Level 4
Meat Processors Group	W37A	Level 1
MEFE-FREUND Australia	M61	Level 4
Mérieux Nutrisciences	V61	Level 1
Mettler Toledo	D50	Level 4
Millsom Materials Handling	P42	Level 1
Milmeq	H55	Level 4
Minipack International	K22	Level 4
Minus 40	R11	Level 1
MM Kembla	Q33	Level 1
Moda	M29	Level 4
Moffat	J17	Level 4
Moguntia Food	W10	Level 1
MPI Australia	J18	Level 4
MTA Australasia	P43	Level 1
Multivac Australia	i30	Level 4
MUN Australia	U60	Level 1
Munters	P15	Level 1
Nano Bubble Technologies	A4	Level 4
National Weighing and Instruments	O46	Level 4
Naturex Australia	V10	Level 1

# Quality, Efficiency and Safety

Optimize humidity, temperature and CO<sub>2</sub> levels with truly stable measurement instruments

- Produce food products energy-efficiently without over-drying
- Improve environmental conditions in food facilities
- Ensure safe CO<sub>2</sub> levels in fermentation and beverage manufacturing



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[www.vaisala.com/food](http://www.vaisala.com/food)

# VAISALA

Company Name	Stand No.	Venue Level
Newly Weds Foods	W26	Level 1
Next Instruments	X61	Level 1
NORD DRIVESYSTEMS	S17	Level 1
Nu-Mega Ingredients	Y16	Level 1
Nutradry	U9	Level 1
O'Brien Boiler Services	R34	Level 1
OFI Weigh & Inspection Solutions	A53	Level 4
Omron Electronics	S4	Level 1
Oomiak Refrigeration	P29	Level 1
Orbit Cleaning Services Australia	T61	Level 1
Osborne Richardson	Q20	Level 1
Ozkor	W29A	Level 1
Pac Food	A3	Level 4
Pacific Food Machinery	J4	Level 4
Pall Australia	S5	Level 1
PAQ-IT	O26	Level 4
Paravian Consulting Services	SC3	Level 1
Partech Inc	V50	Level 1
Pathtech	Y51	Level 1
PCM Group Australia	P23	Level 1
Peacock Bros	i61	Level 4
Pentair Flow Technologies Pacific	X33	Level 1
Perfect Automation	i17	Level 4
PerkinElmer	Y49	Level 1
Perten Instruments	W53	Level 1
PharmEquip	P31	Level 1
Pigo Srl	A27	Level 4
Preserve Wrap	C61	Level 4
Procon Australia	S62	Level 1
Procut Australia	D42	Level 4
ProMinent	Q29	Level 1
Propac Industrial	C48	Level 4
Propharma Australia	U11	Level 1
Proseal Australia	N59	Level 4
PT Associates-Marchant Schmidt	G62	Level 4
Pump Engineers (Australia)	S33	Level 1
Qingdao Haoyu Packing Co Ltd	T52	Level 1
QT9 Software by AssistUs	SC11	Level 1

Company Name	Stand No.	Venue Level
Reactive Engineering	M3	Level 4
Redox	U10	Level 1
Rentokil Initial	R40	Level 1
Result Group of Companies	C54	Level 4
Rexnord Australia	O48	Level 4
Rhima Australia	S24	Level 1
Riverina Oils	X26	Level 1
RMR Process	S56	Level 1
Robotic Automation	A30	Level 4
Rollex Australia	C42	Level 4
Rowe Scientific	Y45	Level 1
Roxset Health & Safety	S3	Level 1
Rydell Beltech	D56	Level 4
Sammode Lighting Australasia	P35	Level 1
Sanderson Australia	W62	Level 1
Sandvik Process Systems	H62	Level 4
Sanita Work Shoes	V52	Level 1
Saraya Australia	R46	Level 1
Savannah	Y8	Level 1
Schur Star Systems	D61	Level 4
Sciex	X58	Level 1
Scott Automation & Robotics	E9	Level 4
Sealed Air Food Care	G30	Level 4
Select Equip	J50	Level 4
Shanghai Chuangfa Material	T52	Level 1
Shanghai One-Stop Engineering Co Ltd	T52	Level 1
SHIMADZU	Y48	Level 1
Shunling Refrigeration Kitchenware Equipment Factory	T52	Level 1
Silikal Australia	R50	Level 1
Smo-King Ovens	G41	Level 4
Sonic Food and Water	U41	Level 1
Sopura Australia	T18	Level 1
Source Certain	SC4	Level 1
Southern Engineering Solutions	C58	Level 4
Spanset Australia	T53	Level 1
Sphere Foods	Y26	Level 1
Spray Nozzle Engineering	Q10	Level 1
Spraying Systems	R19	Level 1
SPXFLOW	L50	Level 4
Stainless Tanks & Mix	W39	Level 1
Statewide Bearings	X39	Level 1
Summit Machinery	L56	Level 4
Superior Pump Technologies	P11	Level 1
Surecove/Stainless Drains	Q18	Level 1
Suzhou Hundred Machinery	T52	Level 1
Suzhou Tipack Co Ltd	U61	Level 1
Sweepers Australia	Q62	Level 1
Symbio Laboratories	Y38	Level 1
Symetec	J42	Level 4

Company Name	Stand No.	Venue Level
TABASCO®	V20	Level 1
Techniques Incorporated	W9	Level 1
Techstaff	X46	Level 1
Temperature Technology	X45	Level 1
Tennant Australia	S46	Level 1
Teralba Industries	W55	Level 1
Test Strips Online	V56	Level 1
The Directus Group	A22	Level 4
The Le Mac Australia Group	K61	Level 4
The University of Melbourne	SC6	Level 4
Themasorb	O54	Level 4
Thermo Fisher Scientific	V40	Level 1
Thompson Meat Machinery	L29	Level 4
Thornhill Australia	Q60	Level 1
Thriving Enterprises	B30	Level 4
Total Construction	S40	Level 1
Trimatt Systems	N60	Level 4
Triton Commercial Systems	G45	Level 4
Tronics	N3	Level 4
Trumps	V19	Level 1
Tsubaki Australia	P47	Level 1
ULMA Packaging Australia	E17	Level 4
Ungerer Australia	W11	Level 1
Unitherm Food Systems	E48	Level 4
Universal Robots	H61	Level 4
Utien Pack	H45	Level 4
Varavoot Industry Co	Y24	Level 1
Vaughan Constructions	R23	Level 1
Vega Australia	W37	Level 1
Vemag Australia	G3	Level 4
Vibration Systems	A52	Level 4
Viscon Australia	T46	Level 1
VisoTec Pumpen-u	Q61	Level 1
Visy Technology Systems	A12	Level 4
W & P Reedy	D47	Level 4
Walls Machinery	N41	Level 4
Watson-Marlow Fluid Technology Group	Q12	Level 1
Wave Industries	Y62	Level 1
Wells Hygiene	P40	Level 1
Wesmartin	F62	Level 4
What's New in Food Technology & Manufacturing	P20	Level 1
Wiley	Q4	Level 1
Wilmar BioEthanol	V17	Level 1
Worldwide Coding Solutions	L62	Level 4
Xylem	P30	Level 1
Zhejiang Ribon Intelligent Equipment	T58	Level 1
Zhucheng Jinding Food Machinery	T52	Level 1
Zhucheng Xinxudong Machinery Co Ltd	T58	Level 1







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## You can also get educated at foodpro

foodpro 2017 is more than an opportunity to view new technology and equipment, it's also a place to learn about the industry and the resources and knowledge within it.

The seminar program at foodpro works to teach and encourage discussion around pertinent topics and issues affecting businesses. Solutions for food processing and manufacturing systems, which use brand new technology, will be explained through in-depth sessions, giving visitors the opportunity to ask questions relating directly to their own businesses. There'll be a renewed focus on handling issues, food safety and refrigeration, while new topics such as advanced mobile robots and foreign body detection will bring opportunities to look at the new capabilities of technology ahead.

### Seminar topics include:

- Taking action to tackle food waste challenges.
- Mixed reality — the future of decision-making in the food supply chain.
- A new era in foreign body identification — learn how to protect your brand.
- Labelling and the law by Food Authority NSW.
- Getting food to market — making the most of your food label.
- How technology has advanced mobile robots and how they can help improve food processing.
- Integration of hygienic drainage systems into food processing designs.
- Combating the cost of increased entry-level skill requirements in the FMCG sector.
- Food safety program validation, shelf-life determinations, routine quality control of products.
- 7 facts about *Listeria* you did not know.
- Gain more refrigeration capacity and use less energy with your current refrigeration plant.

For the full seminar program, visit [www.foodproexh.com/foodproseminar](http://www.foodproexh.com/foodproseminar).

## The future of food

Colocated with foodpro 2017, the Australian Institute of Food Science & Technology (AIFST) will be holding its 50th Anniversary Convention on 17–18 July 2017.

- AIFST 50th Anniversary Convention
- 17–18 July 2017
- ICC, Darling Harbour, Sydney
- Registration: [www.aifst.asn.au/online-registration](http://www.aifst.asn.au/online-registration)

With a foundation firmly in science, technology and innovation, The Future of Food themed 50th Anniversary Convention will explore cutting-edge science, emerging technologies and leading innovations set to enhance and drive the Australian food industry forward for decades to come.

The convention this year is aptly themed 'The Future of Food' and will feature a prestigious line-up of speakers including Bega Cheese Executive Director Barry Irvin and CSIRO Chief Executive Larry Marshall.

### Sessions will cover:

- the consumer of the future;
- future technologies;
- innovations advancing the food industry;
- managing emerging threats and vulnerabilities;
- navigating the export and regulatory market;
- insights into current research that will underpin the next 50 years of the Australian food industry.

Key sessions will include food safety, packaging, sensory, nutrition and more.

### Convention program highlights

- Innovation: The future consumer; emerging innovations; future nutritional needs; fact of fiction: debunking myths.
- Technology: Where to next: the future of technologies; navigating the regulatory environment; packaging innovation; gaining efficiencies — what's next?
- Science: Managing emerging threats and vulnerabilities; sensory — the future palate; food safety.
- Future people and capabilities: Student product development competition sensory — taste the future; Malcolm Bird and sensory award presentations.
- Export: Asian insights; navigating the export market.
- JR Vickery Address: Bega Cheese Managing Director Barry Irvin.
- Government panel: Effective Government Policy to Underpin the Innovation Agenda in the Food Industry.
- Industry roundtable: Financing innovation and growth in the Australian food industry.
- Young professionals in food networking breakfast: For AIFST members aged 30 years and under.
- AIFST Fellows breakfast: An opportunity for Institute Fellows to network and meet newly appointed Fellows.

Registrations have opened — visit [www.aifst.asn.au/online-registration](http://www.aifst.asn.au/online-registration) to secure your place at the convention now.



## Getting to foodpro 2017

The ICC Darling Harbour will be hosting foodpro from 16 - 19 July. For many of us this will be our first visit to the new convention centre — so here is a quick run-down of how to get to ICC 14 Darling Drive, Sydney, NSW 2000.

foodpro will be located at the newly built International Convention Centre in the heart of Darling Harbour. The venue's precinct has secure parking available, along with multiple forms of public transport travelling to and from the venue.

- **Parking:** The ICC has two parking facilities within the venue: the Theatre Car Park and the Exhibition Centre Car Park. Both car park entrances are located on Darling Drive. Alternately, there are several car parks located within 250 metres of the centre, including the Harbourside Car Park.
- **Public transport: Train:** Town Hall Station is the closest station to the ICC, a 10-minute walk to the venue along Bathurst Street.
- **Bus:** Bus routes 389 (from North Bondi) and 501 (from West Ryde) both stop at Harris Street near Allen Street, a 10-minute walk from the ICC.
- **Light rail:** The ICC has two light rail stops: the Exhibition Centre and the Convention Centre. These are the third and fourth stops after leaving Central Station, travelling towards Dulwich Hill.
- **Ferry:** Ferries provide direct services to Darling Harbour from Circular Quay, King Street Wharf or Pyrmont Bay Wharf.
- **Taxi:** There are two taxi ranks at Darling Harbour:
  - Iron Wharf Place (Near the ICC Convention Centre)
  - Zoliner Circuit (Near ICC Sydney Theatre)
- **Water taxi:** Water taxis run to Darling Harbour from The Rocks, Circular Quay, The Opera House and Luna Park.
- **Airport:** Darling Harbour is located 8 km from Sydney Airport, which is roughly a 25-minute drive. Alternatively, there are trains that run from the Airport to Central Station that only take 10 minutes.



Westwick-Farrow Media  
A.B.N. 22 152 305 336

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

### Head Office

Cnr. Fox Valley Road & Kiogle Street,  
(Locked Bag 1289) Wahroonga NSW 2076  
Ph: +61 2 9487 2700 Fax: +61 2 9489 1265

**Editor:** Janette Woodhouse  
[wnift@wfmedia.com.au](mailto:wnift@wfmedia.com.au)

**Publishing Director/MD:** Geoff Hird

**Art Director/Production Manager:** Julie Wright

**Art/Production:** Tanya Barac, Colleen Sam,  
Linda Klobusiak

**Circulation Manager:** Sue Lavery  
[circulation@wfmedia.com.au](mailto:circulation@wfmedia.com.au)

**Copy Control:** Mitchie Mullins  
[copy@wfmedia.com.au](mailto:copy@wfmedia.com.au)

**Advertising Sales Manager**  
Kerrie Robinson  
Ph: 0400 886 311  
[krobinson@wfmedia.com.au](mailto:krobinson@wfmedia.com.au)

**Germany, Austria, Switzerland - Eisenacher Medien**  
Ph: +49 228 249860 [info@eisenacher-medien.de](mailto:info@eisenacher-medien.de)

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to industry and business professionals



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# CONVEY

**FLEXI-DISC™ Tubular Cable Conveyors** gently slide fragile foods and non-foods through smooth stainless steel tubing routed horizontally, vertically or at any angle, over short or long distances, dust-free. Single or multiple inlets and outlets.



# DUMP

**FLEXICON® Manual Dumping Stations** allow dust-free dumping of bulk material from bags and other containers. Automatic reverse-pulse filter cleaning allows continuous, efficient operation. Available with integral bag compactors for total dust containment.



# UNLOAD

**BULK-OUT® Bulk Bag Dischargers** unload free- and non-free-flowing solids from bulk bags automatically. Allows untying, discharging, retying and collapsing of bulk bags—all dust-free. Available with weigh batching controls.



# CONDITION

**BLOCK-BUSTER® Bulk Bag Conditioners** loosen bulk materials that have solidified during storage and shipment. Variable height turntable positions bag for hydraulic rams with contoured conditioning plates to press bag on all sides at all heights.



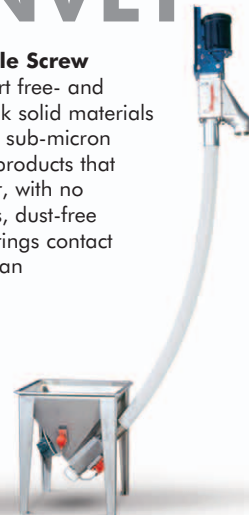
# FILL

**SWING-DOWN®, REAR-POST and TWIN-CENTREPOST™ Bulk Bag Fillers** can fill one bulk bag per week or 20 per hour at the lowest cost per bag. Numerous performance options. Available to industrial or sanitary standards.



# CONVEY

**FLEXICON® Flexible Screw Conveyors** transport free- and non-free-flowing bulk solid materials from large pellets to sub-micron powders, including products that pack, cake or smear, with no separation of blends, dust-free at low cost. No bearings contact material. Easy to clean quickly, thoroughly.



# CONVEY

**PNEUMATI-CON® Pneumatic Conveying Systems** move a broad range of bulk materials over short or long distances, between single or multiple inlet and discharge points in low to high capacities. Available as dilute-phase vacuum or positive pressure systems, fully integrated with your process.



# TIP

**TIP-TITE® Container Tipper** dump bulk material from drums (shown), boxes or other containers into vessels up to 3 metres high. Dust-tight (shown) or open chute models improve efficiency and safety of an age-old task.



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**AUSTRALIA**  
sales@flexicon.com.au  
1 300 FLEXICON

**USA** +1 610 814 2400  
**UK** +44 (0)1227 374710  
**GERMANY** +49 170 8 187 613  
**SPAIN** +34 930 020 509  
**SINGAPORE** +65 6778 9225  
**SOUTH AFRICA** +27 (0)41 453 1871  
**CHILE** +56 2 2415 1286

**flexicon®**  
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