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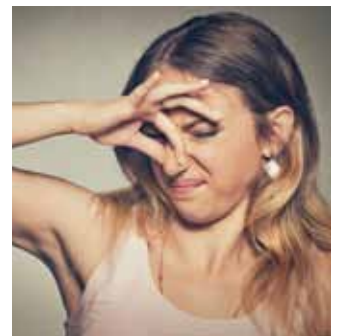
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Listeriosis — Australia v South Africa experiences

Janette Woodhouse

Where would you rather be living, Australia or South Africa? If it comes to food safety the answer is pretty easy.

So far this year more than 1000 people in South Africa have been diagnosed with listeriosis, and 180 have died from the infection. The deaths have not been evenly spread across the population as more than 40% of the deaths have been in neonates — babies under 28 days old — who were most probably infected in utero.

In Australia there have been 10 reported infections and three deaths so far this year. All cases have involved those over 70 years.

Listeriosis can be deadly. The causative bacteria, *Listeria monocytogenes*, is endemic in the environment and preys on the weaker and immune compromised. Rather sneakily, it is not stopped by refrigeration and, because symptoms can develop any time from three to 70 days, trace-back to establish the source of the contaminated can be quite complex.

Now compare where you would rather be living. In Australia a disease outbreak was recognised on 17 January, with all cases occurring between then and 9 February. A rockmelon grower in Nericon, NSW, voluntarily ceased production on 23 February after being notified it was linked to the disease outbreak. Food Standards Australia New Zealand (FSANZ) coordinated a trade recall of whole rockmelons and all major supermarkets withdrew rockmelons from their shelves. Consumers were assured that rockmelons currently available on shelves were not implicated in the outbreak.

Still, nobody is happy — after all there were 10 elderly people affected by the disease and three died.

However, compare this disease outbreak to the outbreak of listeriosis in South Africa. It is only in the last day or so that the source of the *Listeria monocytogenes* strain ST 6 outbreak has been tied to polony produced by Enterprise Foods and RCL Foods in Polokwane, Limpopo. According to the South African National Institute for Communicable Diseases (NICD) a shortage of the solution used for testing for the *Listeria* bacteria meant the results of the tests at the Polokwane factory were delayed by two weeks. Even so, the disease outbreak has been being investigated since last year with the source only just revealed. A 'ready-to-eat' sausage recall has now been instigated and the implicated factory is reportedly going to be closed.

No foodborne disease is acceptable, but I really think we should be acknowledging the speed and efficiency of the Australian response, especially when you compare it to the South African experience. 🐮

Information in this article was correct at the time of printing.



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Stopping norovirus

Norovirus — the scourge of the cruise ship and, recently, the Pyeongchang 2018 Olympic Winter Games. The incapacitating and vaccine-less virus is known to spread from person to person, and it has long been suspected that people can also catch the illness from touching contaminated surfaces.

A study by Arizona State University applied mathematicians in *Royal Society Open Science*, tracked the different ways that norovirus spreads, and which one infects the most people. They refined their model by fitting it to data from a real-world outbreak — in this case, the daily number of cases among crew and passengers over the course of two cruises.

“The data from the two groups gave the model the sensitivity it needed to be able to figure out the relative roles of infected surfaces and people in transmitting the illness,” said Sherry Towers, the study’s lead author and professor at the Simon A. Levin Mathematical, Computational and Modeling Sciences Center.

“The findings indicate that, although environmental transmission by itself is enough to keep an outbreak going, person-to-person contact is the primary mode of transmission,” Towers said.

This explains why densely populated environments with large common areas like cruise ships, resorts and Olympic villages are the perfect settings for wide-scale outbreaks. But knowing that personal contact is the main way the disease spreads also provides a solution.

What preventative measures work?

Because aggressive steps like self-quarantine and avoiding people who are already infected often happen too late — or not at all — in these environments, the team’s next step was to compare the effectiveness of different preventative measures, such as hand washing and surface cleaning, in halting the spread.

“It only takes a few virus particles to make you sick, so no matter how stringent the cleaning, it is next to impossible to remove all the virus from contaminated surfaces,” Towers said. “However, since the primary route for infection is hand-to-mouth contact, you can’t be infected if you wash your hands thoroughly before eating or touching your face.”



Low-fat or low-carb for weight loss?

The eternal question has been whether a low-fat or low-carb diet is more effective in weight loss. Now Stanford researchers have found that neither option is superior. They also established that neither insulin levels nor a specific genotype pattern could predict an individual’s success on either diet.

In the past research has shown that a range of factors, including genetics, insulin levels and the microbiome, might tip the scales when it comes to weight loss. The new study, published in *JAMA*, homed in on genetics and insulin, seeking to discover if these nuances of biology would encourage an individual’s body to favour a low-carbohydrate diet or a low-fat diet.

More than 600 people participated in the study. At the end of the 12 months, those on a low-fat diet reported a daily average fat intake of 57 grams; those on low-carb ingested about 132 grams of carbohydrates per day.

During the year, researchers tracked the progress of participants, logging information about weight, body composition, baseline insulin levels and how many grams of fat or carbohydrate they consumed daily. By the end of the study, individuals in the two groups had lost, on average, 5.9 kg. There was, however, immense weight loss variability among them; some dropped upward of 27 kg, while others gained close to 9 kg. But, contrary to the study hypotheses, no associations between the genotype pattern or baseline insulin levels and a propensity to succeed on either diet was found.





Want Rockwell? See NHP

NHP Electrical Engineering Products has been appointed as sole distributor for Rockwell Automation products in the South Pacific from 1 May 2018.

With the acquisition of Rexel Industrial Automation's (RIA) New South Wales and South East Queensland business assets related to the distribution and supply of Rockwell Automation, NHP will have sole distributor rights for Rockwell Automation products, systems and solutions in the South Pacific including Australia, New Zealand, Fiji and Papua New Guinea.

During April 2018, NHP and Rexel Industrial Automation will continue to trade as separate entities while the acquisition is formalised. NHP will be in contact with all RIA customers throughout April to ensure a seamless transition of products and services.



T&G Global sells NZ processed foods business

T&G Global has agreed to sell the major assets of its subsidiary ENZAFoods New Zealand, trading as T&G Foods, to natural fruit and vegetable ingredient producer Cedenco.

T&G stated it was considering this sale in October 2017. Since the company's strategy is to focus on its core business of growing, sourcing, packing, marketing, selling and transporting fresh produce in New Zealand and globally, it concluded that T&G Foods is "non-core and consequently should be either sold, rationalised or closed".

The agreement will see Cedenco taking on the food processing business, employees, assets and the long-term property lease in Hastings, as well as the fruit ingredient assets in Nelson. Together, these two manufacturing sites can process up to 200,000 metric tonnes of apples and other fruit.

The deal will be settled on 20 April, but until then T&G will continue to operate T&G Foods and retain its existing

employees. Its pipfruit division, which is responsible for growing, packing and distributing apples and pears globally, also has a supply agreement with Cedenco for processing apples.

Furthermore, T&G's small format pouch assets in Nelson have been sold to NZ Apple Products, along with a three-year lease agreement of its Nelson site.

"T&G Foods' people, products and production facilities will benefit from being owned and operated by Cedenco and NZ Apple Products Limited, who are both focused on fruit processing and are willing to invest for the long term," said Tim Clarkson, chief strategy officer for T&G. "The New Zealand apple and pear industry needs good fruit processors and T&G is delighted to have such strong local partners to take the business forward."

T&G is discussing its apple juice concentrate facility in Nelson, and further announcements will be made in due course.

Fonterra invests to reduce water use by 70% at Darfield

An \$11 million investment in water processing technology at Fonterra's Darfield plant will reduce the amount of groundwater extracted at the manufacturing site by around 70%.

Construction is already underway on the new plant, which uses a reverse osmosis technique to purify the water extracted from cows' milk during the manufacturing process. Water is passed through a membrane filtration system which makes it drinkable and suitable for use in a range of on-site activities such as cooling, heating and cleaning.

"Thanks to the new plant, we'll save the equivalent of around 100

tanker loads of water every day," said Robert Spurway, head of Fonterra's Global Operations.

"As well as reducing water use, the new technology also decreases the amount of water the site discharges for irrigation. It's a win-win situation."

The Darfield development aligns with Fonterra's six water commitments to help improve the quality of New Zealand's waterways.

The new plant is expected to be up and running by October this year, in time for the 2018/2019 milk season.



Track your eating habits with tooth-mounted sensors

Remembering everything you have consumed can be difficult, and most people are guilty of mindlessly eating. This makes it difficult to understand the impact of food and drinks on health, but what if there was a way to accurately track what you consume? Scientists may have found a solution using a tiny device inside the mouth.

Researchers from the Tufts University School of Engineering have created miniature sensors, as small as 2 x 2 mm, that can be mounted directly onto a tooth to monitor dietary intake in real time. The sensors wirelessly send information about a person's consumption of glucose, salt and alcohol to a mobile device, similar to electronic toll collection.

Fiorenzo Omenetto, PhD, corresponding author and the Frank C. Doble Professor of Engineering at Tufts, explained, "We have extended common RFID [radiofrequency ID] technology to a sensor package that can dynamically read and transmit information on its environment, whether it is affixed to a tooth, to skin or any other surface."



Made up of three sandwiched layers, the sensor has a central "bioresponsive" layer that absorbs the nutrient or chemicals, surrounded by two outer layers consisting of two square-shaped gold rings.

They act like a tiny antenna, collecting radio waves and transmitting them back in an altered form, depending on what it detects. For example, if the bioresponsive layer takes on salt, this will cause its electrical properties to shift, which will result in the sensor absorbing and transmitting a different spectrum of radiofrequency waves.

"In theory we can modify the bioresponsive layer in these sensors to target other chemicals — we are really limited only by our creativity," Omenetto said.

Other wearable devices have been developed to monitor dietary intake, but they have a number of downfalls including bulky wiring, requiring the use of a mouthguard and needing to be replaced frequently. However, this sensor can flexibly bond to the irregular surface of a tooth, as well as many other surfaces, and has the potential to detect other nutrients, chemicals and physiological states.

So sneaking some chips or a beer into your diet might not be as easy in the future.

The research was published in the journal *Advanced Materials*.



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UK food retailers ban energy drink sales to children

The UK's eight largest food retailers — Waitrose, Tesco, Co-op, Asda, Sainsbury's, Aldi, Lidl and Morrisons — have all implemented bans on the sale of energy drinks to children, banning the sale of products with a caffeine content of more than 150 mg/L to anyone under 16 years old. Boots became the first non-supermarket retailer to join them in March 2018.

Data and analytics company GlobalData emphasised that the retailers have taken it upon themselves to limit access to the energy drinks without any formal direction or regulation coming from the UK Government.

The fact that this potentially profit-limiting step has been taken without government regulation or a call for retailers to take voluntary action is unusual, but shows the importance large retail chains place on maintaining a responsible brand image.

Associate Analyst at GlobalData William Grimwade commented, "Major retailers have become extremely concerned about monitoring opinion of themselves on social media, and the highly competitive nature of British supermarket retailing means retailers do not want to be seen to be out of step with their competitors on issues like this."

The National Association of Schoolmasters Union of Women Teachers (NASUWT) has gone as far as attributing some cases of poor behaviour of children in schools to high energy drink consumption. The #NotForChildren campaign has become prominent on social media among a variety of stakeholders, including health-concerned celebrity chef Jamie Oliver, charity Action on Sugar, MP Maria Caulfield and NASUWT, the teachers union.

Grimwade added, "Retailers and energy drinks producers are also likely to suffer from the introduction of the sugar tax in the UK from 8 April 2018. The vast majority of energy drinks brands rely on sugar, as well as caffeine and other additives, to allow them to give the consumer the energy rush their brand depends on. This means that they will be unable to reduce sugar content and their prices in independent retailers still selling them to under 16s will be forced upwards, compounding the effect of the supermarkets ban."

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Control Logic and GE partnership strengthens

Control Logic was celebrated for its successes at GE's prestigious Channel Advisory Conference held in Shanghai, receiving Top Channel Partner for the APAC region as one of its three awards. The company also picked up the Most Creditable Channel Award and the Best Growth Channel Award.

Control Logic General Manager of Products and Marketing Lee Papadimitriou suggested the awards highlighted the efforts of his team and the continuing partnership between Control Logic and GE.

"These awards are a direct reflection of the dedication and skill set within the entire Control Logic team, and our value-add solution solving approach resonates not only with our customers but also our valued suppliers."

Control Logic is the exclusive distributor of GE Automation & Controls hardware and software solutions nationally.

The GE awards followed shortly after the company received ABB's Channel Partner of the Year for the water and wastewater sector in Australia. "It's a great credit to the strong partnership we have with ABB, which enables us to focus on specific verticals and develop business in unison," Papadimitriou added.

Reducing *Listeria's* virulence

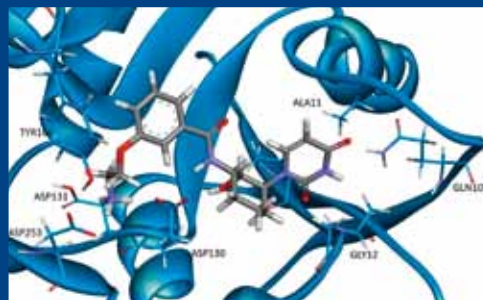
Listeria has been in the news a lot lately — five elderly Australians have died after eating contaminated rockmelons, at least 183 South Africans have died after eating *Listeria*-contaminated polony, eight are dead after eating frozen corn in Europe/UK — this is one pretty nasty bacteria.

Now researchers from North Carolina State University have identified several compounds that may be effective in containing *Listeria's* virulence — or ability to produce disease. The researchers already knew that inhibiting the glucose-1-phosphate uridylyltransferase (GalU) enzyme in *Listeria* significantly modifies the bacterial cell surface and this, in turn, renders the *Listeria* much less virulent and so less able to cause illness.

The researchers turned their attention to identifying potential compounds that could inhibit the function of GalU. Using computers and cheminformatics methods, they characterised, analysed and virtually screened more than 88,000 compounds with the potential to inhibit GalU.

Computer models found 37 compounds promising enough to be tested in vitro. Of the 37, three were deemed effective enough to warrant further study.

Interestingly, inhibiting GalU also served to make the *Listeria* more vulnerable to cefotaxime, an antibiotic to which the bacteria are naturally resistant.



Country of origin labelling for fast food outlets

Minister for Agriculture and Water Resources David Littleproud MP has written to fast food outlets inviting them to discuss voluntarily displaying country of origin information to tell consumers more about where their food comes from.

This is strongly supported by the horticulture peak industry body, AUSVEG.

From 1 July it will be mandatory for all food products sold in retail stores to include country of origin information. However, some food products, including food sold for immediate consumption at fast food outlets and cafes, are exempt.

Given access to the information and reasonable pricing it is known that consumers will choose locally grown food in preference to imported. However, if the country of origin information isn't available consumers can't express this preference and local producers miss out.

"The inconsistent, two-tiered approach to the new labelling is problematic for consumers, but if the fast food industry can get on board and agree to voluntarily display these labels on their food products, it would be a decisive affirmation of the right of Australian consumers to make more informed decisions about the food they buy," said AUSVEG CEO James Whiteside.

"AUSVEG has been a vocal advocate for clearer country of origin labelling and we hope that the fast food industry, and other industries which will be exempt from mandatory labelling, adopt the labelling so that consumers are able to make more informed purchasing decisions."





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Researchers upcycle wine waste

Currently around 25% of each grape is wasted — but changes are afoot.

Wine has been a staple alcoholic drink for thousands of years, but it appears we have not been utilising the whole grape in the winemaking process.

With the seeds, stalks and skins of the grapes all considered 'waste' products — known as pomace — about a quarter of each grape ends up in landfills. According to the Food and Agriculture Organization of the United Nations, every year the global wine industry produces about 14 million tons of pomace, and this can result in a number of environmental problems.

It can cause surface and ground water pollution caused by the pesticides and fertilisers on the grapes, and over a long period of time it will facilitate the spread of disease via flies.

Pomace can be used as a fertiliser, and some winemakers have soaked grape skins in water to produce a weaker 'second wine'. Changmou Xu, a research assistant professor at the University of Nebraska-Lincoln, led a team of researchers in an attempt to find other ways to upcycle grape waste, with potential applications in the food industry.

Xu explained that re-using pomace would not only reduce the environmental pollution, but it could also increase the economic value of the grape and wine industry.

Pomace is high in natural antioxidants, such as proanthocyanidins, anthocyanins and ellagic acid, which protect against the by-products of oxygen metabolism that can harm the body. Therefore, it has applications in dietary supplements, pharmaceuticals and cosmetics.


"We are also developing some applications in food, aiming to substitute artificial antioxidants with natural antioxidants from grapes for a 'clean label' food with only natural ingredients," Xu said.

Xu's team is developing technologies to extract and

separate antioxidants from the grape waste and remove any pesticides.

Adding these antioxidants to fatty foods such as mayonnaise and ranch dressing extended the shelf life of these foods, especially when exposed to high temperatures. In a previous study, Xu and his team reduced acrylamide, a chemical formed in high-temperature cooking, in potato chips by 60% using an antioxidant from pomace.

"We are continuing to enhance efficiency of this inhibition and aim to make the phenolic compounds' performance comparable with that of ethylenediaminetetraacetic acid (EDTA), which is an artificial antioxidant," Xu said.

EDTA can be safely added to foods, cosmetics and medicine, but with consumers increasingly demanding more natural ingredients with fewer artificial additives, EDTA does not meet these needs. Instead, Xu suggested that grape pomace may be the natural ingredient that is considered more label-friendly and appealing to consumers. 



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Brumotactillophobia and packaging innovation

Andrew Wilkinson, Advanta

Brumotactillophobia, the fear of different foods touching on the same plate, is viewed by psychologists as a mild form of obsessive-compulsive disorder and a hangover from childhood fussy eating. Andrew Wilkinson, senior UK sales manager at Advanta, explains why a fussy consumer is beneficial to food manufacturers, as it drives the food packaging innovations of the future.

Compartmentalisation

Compartmental foil trays allow the consumer to cook runny components separately, maintaining the flavour and appearance of the end meal. It's not just the brumotactillophobics that benefit from components being kept apart. Flavours, textures and colours kept separate during the cooking process make the finished meal more appealing to everyone.

Placing sauce sachets within a non-compartmental tray offers similar flexibility and autonomy to the consumer, allowing for sauce to be added part way through the cooking process.

Sustainability

In January 2018, the British Prime Minister, Theresa May, announced her 25-year plan to eradicate unnecessary plastic waste and introduce plastic-free aisles to supermarkets. She called plastic waste "one of the great environmental scourges of our time", adding that, "in the UK alone, the amount of single-use plastic wasted every year would fill 1000 Royal Albert Halls".

Food developers need to get ahead of this movement, realising more and more consumers are looking to reduce their plastic waste and look to other material alternatives. The word is out. Every scrap of aluminium put in the consumer's recycling bin can go on to be cleaned, melted and reformed into more aluminium products. This means it doesn't go to landfill or end up in the world's oceans.

As aluminium is endlessly recyclable, we will likely see customers opting for foil containers over plastic equivalents.

Wrinkled or smooth?

Assuming you're on board the aluminium train, seeing the benefits this material brings to the environment, then you will also need to assess whether your product is more suited to a wrinkled or smooth-wall tray. While both types are eco-friendly,

microwavable and freezable, the wrinkled-wall tray offers a lower price point and a more traditional foil tray feel.


For a sophisticated look and stronger capabilities, smooth-wall foil containers offer a heavy-duty construction, perfect for ready meals, meat joints and barbecue food. These can be hermetically heat sealed with standard

film for a leak-proof finish. In addition, modified atmosphere packaging (MAP) can also be used to extend shelf life. This packaging does not soften at high temperatures, meaning the consumer avoids any mess.

Stand out

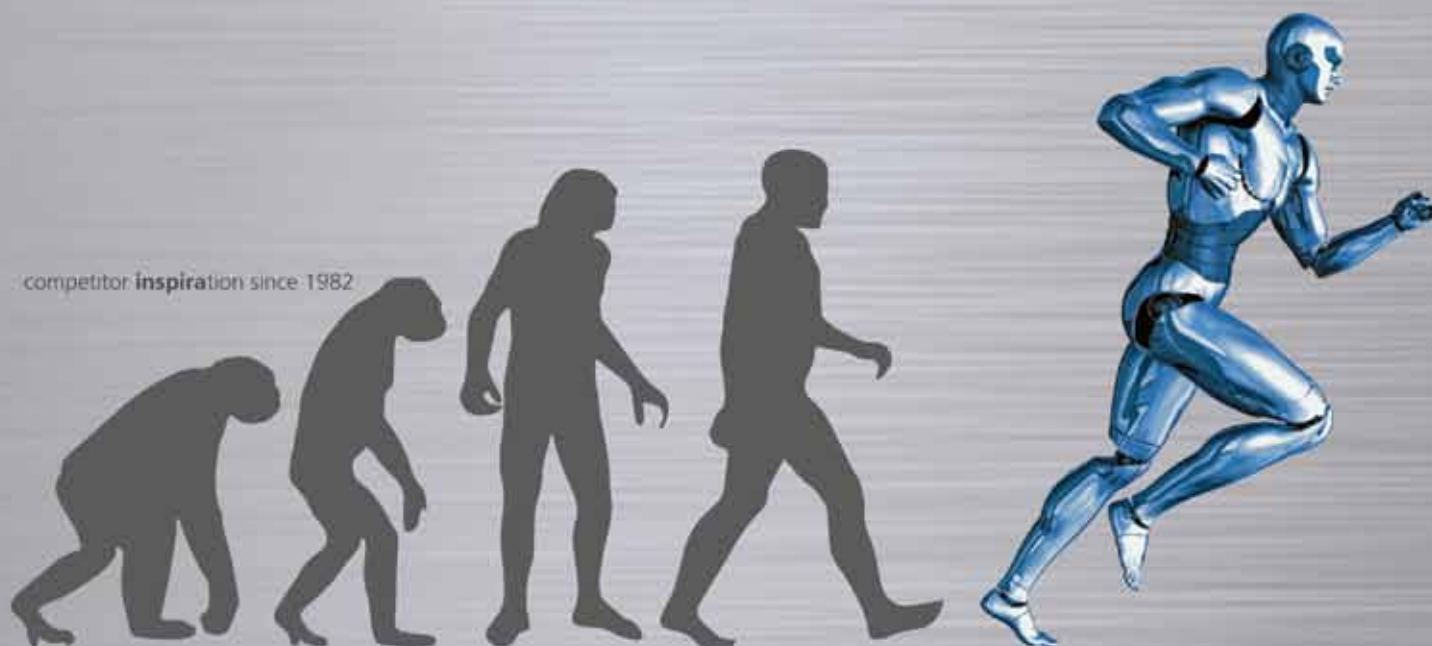
The Waitrose Food and Drink Report 2017 highlights changes in consumer behaviour. With more convenience stores and longer opening hours, we are seeing more shoppers visiting the supermarket on a daily basis, often after work. This new trend has been coined "as and when shopping". After their busy day at work, it's even more important for consumers that the products they buy stand out as convenient, nutritious and visually appealing.

While silver foil trays are classic, shiny and appealing in their simplicity, we may see an emergence of more vibrant options to attract the after-work shopper. Aluminium containers can be as unique as you want; any colour, branding or embossing is possible. Think bigger, bolder ideas if you want your product to stand out on the shelves. Lacquered foil trays create luxury shelf appeal, positioning your product as the premium option.

Brumotactillophobia may not characterise your general target market, but it does represent a wider issue of meeting ever-changing customer needs on a practical, sustainable and aesthetic level. Food manufacturers need to stay ahead of these trends if they are to remain competitive. 



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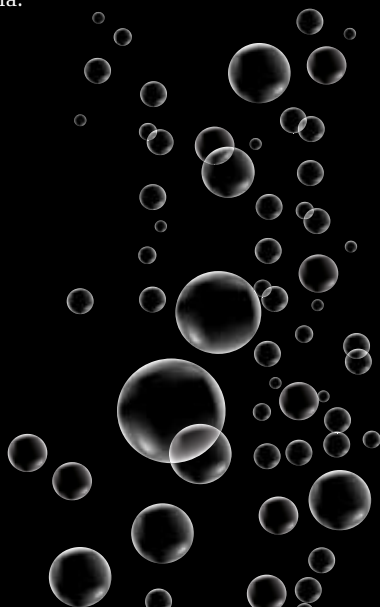
Understanding bubble science and beverage flavour

In spite of the popularity of carbonated drinks, little is known about the chemistry behind the bubbles. Some studies have focused on alcoholic beverages, reporting findings on how carbon dioxide bubbles rise and pop. It is also known that hydrogen bonds within beverage solutions are impacted by additives and other components in the water used in the process.

Now, Yakun Chen, Ji Lv and Kaixin Ren have investigated how drink additives such as sugar, salt and added flavours affect the carbon dioxide and ultimately, the taste of the drink.

The team studied how different flavourings affected the carbon dioxide in champagnes, cola drinks and club sodas by setting up simulations. The group first examined how fast carbon dioxide diffused within each solution. They found that additives like alcohol, table sugar or baking soda would reduce the rate of diffusion, to an extent, which would leave soda fizzy for a longer period of time. The researchers also noted that the simulations showed that as carbon dioxide interacts with additives like sugar, it also interacts with the water that makes up the majority of these beverages. When a drink additive was incorporated, the team noticed that the number of hydrogen bonds decreased with their simulation, ultimately impacting the taste of the drink.

The team has published their results in ACS's *The Journal of Physical Chemistry B* and also acknowledges funding from the National Natural Science Foundation of China.



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Technology extends the shelf life of bread by three weeks

Antimicrobial packaging solutions that improve food safety and reduce food waste are on the near horizon.

The EU-funded NanoPack Project aims to develop and demonstrate antimicrobial packaging solutions for perishable foods based on natural nanomaterials that will prevent foodborne illness outbreaks and reduce food waste caused by early spoilage. The active polymer films developed by NanoPack exhibit broad-spectrum antimicrobial properties unmet by existing state-of-the-art materials, which include currently used nanomaterials such as silver particles, which have raised health concerns of toxicity and microbial resistance.

The project is using natural halloysite nanotubes (HNTs) to reliably and safely carry bioactive compounds which are unable to migrate from the food packaging into food. Minute amounts of potent, volatile and broad-spectrum natural agents are released from the HNTs into the packaging headspace. Using nanotechnology like this enables:

- the introduction of sensitive molecules into polymer films;
- anti-microbial functionality without impaired film properties;
- the manufacture of potent antimicrobial surfaces with tunable properties, while creating a pH-triggered 'gate keeper' effect to slow down release of the encapsulated payload.

A first round of antimicrobial efficacy tests has demonstrated the NanoPack film's ability to inhibit mould growth on food-additive free bread. Breads that were inoculated with relevant-mould spores and packed with NanoPack's innovative film had no mould growing for up to 27 days post packaging — effectively the film has extended the shelf life of bread by three weeks.

"The tests results confirmed the ability of our antimicrobial packaging solutions to significantly extend shelf life, improve food safety and reduce food waste," said NanoPack's coordinator Ester Segal, associate professor at the Technion-Israel Institute of Technology. "We are currently getting ready for the second round of testing with newer and more sophisticated film formats to expand these promising results to other perishable foods and further improve performance."

NanoPack, which is led by the Technion – Israel Institute of Technology, is funded as part of HORIZON 2020, the EU Framework Programme for Research and Innovation.

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Solar-powered brewery delivers sustainability

With regard to renewable energy, Namibia Breweries Limited (NBL) has put into practice what others only talk about. The company has a 1 MW roof-mounted solar plant with more than 4000 panels, 66 inverters and four cluster controllers. The whole system is connected to three of the company's generator sections. When it was installed in 2013, it was the largest hybrid system in the world and it also made NBL completely self-sufficient regarding electrical power.

But this was only the start. Electricity, though a major component, is only one factor in the complex world of utilities which, today, are highly significant contributors to product costs, competitiveness and profitability. And there's more to effective utilities management than simply watching the meter.

A manufacturing operations management survey conducted by LNS Research showed that the top two operational challenges for meeting strategic manufacturing objectives were that companies had to deal with disparate systems and the lack of cooperation across their different departments.

"In our case, we have the brewing, packaging and distribution departments," said André Engelbrecht, manager: industrial control systems, NBL "Each of them focuses on doing their job to the best of their ability, but without necessarily much concern for the common denominator that makes it all possible: utilities."

NBL decided to unify its various departments into a cohesive entity that could make real-time business decisions with regard to utility usage based on a single version of the facts. The scope of the implementation would include access to the CO₂ plant, NH₃ ammonia cooling, boiler house, water treatment plant, sterile air plant and power meters.

The goal was to be able to record critical production information from the solar, NH₃ cooling, boiler and CO₂ plants, as well as from the water and power meters. NBL also wanted to be able to transfer production information to the existing DCS, and to develop a dashboard system for management to view consumption-related information linked to production volumes and KPIs.

The project was started in February 2015 and changeover to the new system was achieved after a two-week parallel operation during January and February 2016. But

according to Engelbrecht, this is not the end as it is a "living" system designed to grow and supply the company's information needs well into the future.

NBL has a central DCS which controls the beer-making process from beginning to end, but in order to achieve NBL's goals of accurate decision support based on reality and real-time production information, more data collection and collation resources would be needed.

NBL implemented a Schneider Electric information management solution to consolidate data collection and optimise operational visibility across brewing operations.

It implemented Schneider Electric Software's historian to consolidate data acquisition, storage and reporting. The solution now allows users to view utility consumption and production data from anywhere in the plant, increasing operational visibility for improved decision support.

"Having real-time information available at the click of a button is the key to a modern manufacturing business enterprise," said Bernd Esslinger, engineering manager at NBL.

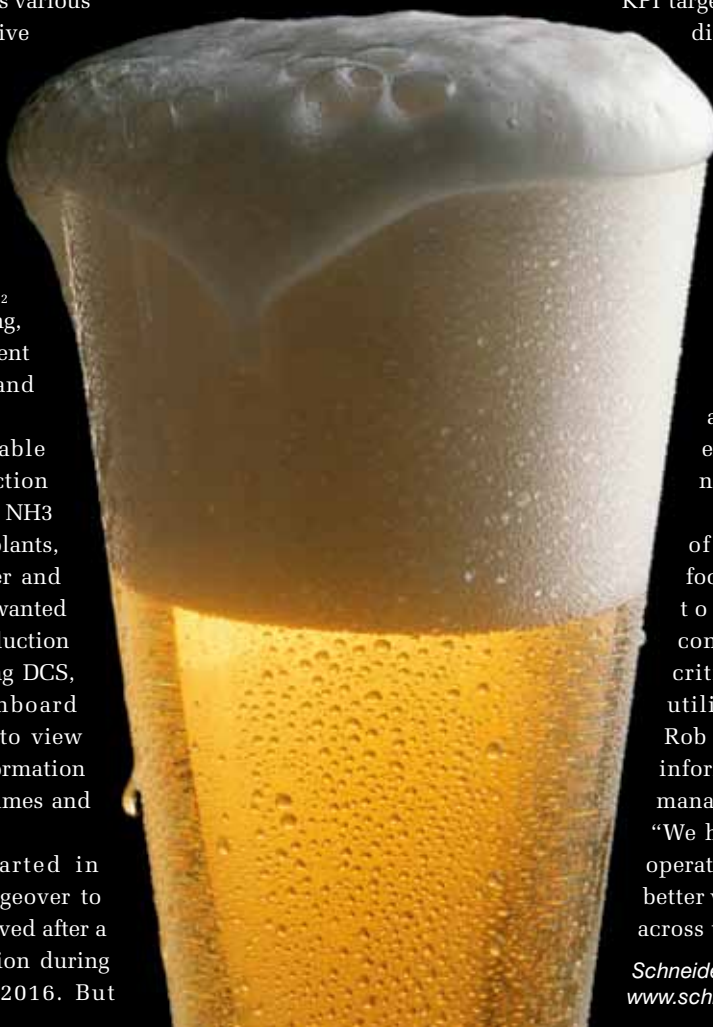
With data now available from across brewing, packaging and distribution, users can work from a single source of truth. Daily, weekly and monthly reports show water, electricity, chemicals, thermal energy, solar generation, carbon dioxide and air consumption, comparing results with

KPI targets. Critical production data is displayed on dashboards in real time and linked to KPIs. In the future, Namibia can use this information to turn off non-critical plant equipment to increase sustainability and help avoid unnecessary costs.

"We were drawn to a Schneider Electric software solution because of its scalability and ease of use, as well as their deep industry expertise and focus on customer needs," said Engelbrecht.

"Energy consumption is one of the highest costs faced by food and beverage manufacturers today. Consolidated, contextualised real-time data is critical to effectively minimise utility management costs," said Rob McGreevy, vice president of information, operations and asset management at Schneider Electric. "We have helped Namibia improve operational performance by enabling better visibility and decision support across their value chain."

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Prepared food



Just because it's 'natural' doesn't mean it's safe

As manufacturers rush to fill consumers' wants for 'natural', they need to be cautious about the source and manufacturing technique of their natural ingredients.

For some reason, natural ingredients are often assumed to be safe — possibly based on the seriously weird premise that 'chemicals' are all synthesised in laboratories while natural ingredients do not even contain chemicals!

This unfounded assumption is patently absurd! Just a quick look at a few plants is all that is required:

- The African staple, cassava, must be thoroughly boiled and soaked to remove the cyanide before it is safe to eat.
- Castor beans have to have ricin removed.
- Death cap mushrooms have killed at least four people in the Australian Capital Territory in the last 16 years.

Regardless of the reasoning, consumers are seeking natural products with 'clean' labels with the erroneous assumption that they are safe and will even support their health and wellbeing.

Manufacturers are capitalising on this misinformation/urban legend and sourcing natural ingredients from non-traditional materials and altering manufacturing processes to meet consumers' demands.

The following extract from 'Natural' Ingredients in Dietary Supplements for Sports Nutrition: Unfounded Assumption of Safety, by Julie A. Brickel, MPH, Burdock Group Advisor eNewsletter, April 2018, burdockgroup.com makes very interesting reading.

Changes in source materials

Manufacturers have found traditional sources of natural ingredients are either exhausted or have become too expensive to maintain profit margins. An example is resveratrol, a popular ingredient used in sports nutrition supplements reported to increase endurance. Grapes are arguably most commonly thought of as a source of resveratrol and, consequently, as is wine, with red grapes containing three- to 10-fold more resveratrol than white grapes. However, Japanese knotweed (*Fallopia japonica*) is reported to contain the highest concentrations of resveratrol, with the roots containing greater amounts than the stems and leaves. Resveratrol was first isolated from white hellebore (*Veratrum grandiflorum*) almost 80 years ago, and other sources include, pistachios, peanuts, plums, tomatoes, mulberries, cranberries, cocoa, apples and grapes. More recently, microorganisms (eg *Escherichia coli* strains) are being genetically engineered to synthesise resveratrol to reportedly increase the production and purity of resveratrol as compared to botanical sources. The takeaway message is that there are many sources of resveratrol, each source containing varying concentrations of the 'natural' ingredient in addition to other constituents that may or may not be chemically characterised and/or considered when assessing the potential toxic effects of the resveratrol co-extractives. >



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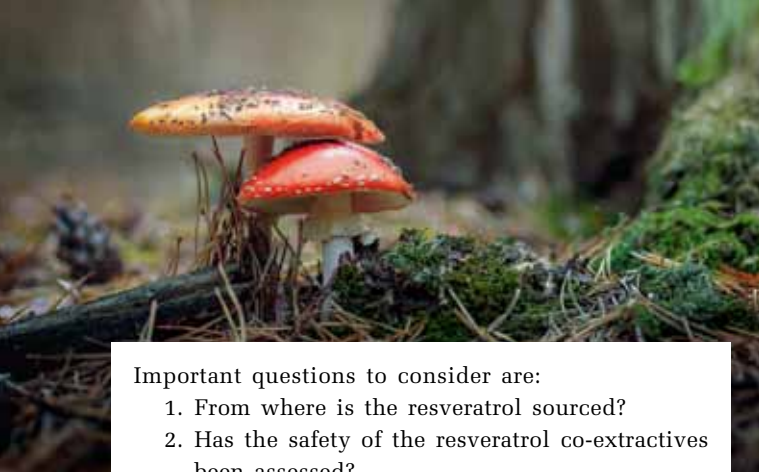
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Important questions to consider are:

1. From where is the resveratrol sourced?
2. Has the safety of the resveratrol co-extractives been assessed?

Changes in manufacturing techniques

Manufacturers may change manufacturing techniques to either increase production, utilize 'natural' solvents or target a different chemical constituent within a 'natural' source material. There is a trend toward 'bio-solvents,' 'eco-friendly' or 'sustainable' solvents (eg ethyl oleate, ethanol, water, supercritical CO₂), resulting in a reduction in use of traditional solvents, such as hexane. The use of non-traditional solvents presents the potential to produce products with different co-extractives, or, at the very least, products with different ratios of extractants than those produced with traditional solvents.

Beetroot or beet root juice is an example of a traditional 'natural' botanical that is now being manufactured to target a specific chemical constituent within the root for use in dietary supplements for athletes. Inorganic nitrate (NO₃⁻) is reported to be the biologically active ingredient in beet roots that increases plasma nitrate concentrations in consumers and supports physiological responses to exercise. Although data are limited and results are conflicting, the proposed mechanism of action reported for beetroot is that it, "dilates blood vessels in exercising muscle, reduces oxygen use and improves energy production." With manufacturers producing beet root juice rich in nitrate, the concentrations of nitrates — in addition to other constituents and contaminants — must be taken into consideration when assessing the safety of such dietary supplements.

As manufacturers strive to meet athletes' demands, 'natural' ingredients are being sourced from different source materials and the manufacturing processes are evolving. These and other changes call into question the safety of these newly sourced or newly processed 'natural' ingredients, as there is opportunity for variations in the chemical composition as compared to traditional 'natural' products. These variations need to be considered when assessing the safety of dietary supplements containing 'natural' ingredients. The safety of 'naturally' sourced ingredients cannot be assumed on the basis of their 'natural' origin or the history of (safe) use of traditional 'natural' dietary ingredients that vary in chemical composition.

Brickell's complete article, including references, can be found at <http://burdockgroup.com/natural-ingredients-dietary-supplements-sports-nutrition-safety>.

So there you have it; it is not just consumers who need to be aware of the feel-good halo around 'natural'. Even manufacturers must be conscious of the source and manufacturing techniques of the natural components in their products.



NEWS

Virgin Australia's six-year catering deal with Gate Gourmet

Virgin Australia has recently announced that Gate Gourmet will be its sole service provider for the next six years. Operating a total of 450 domestic and international flights every day, Virgin Australia travellers flying across Asia, Australia and North America will be serviced by Gate Gourmet, the catering brand of gategroup.

gategroup already provides inflight dining and handling on Virgin Australia flights, but this long-term agreement will see a 40% increase in its portfolio and create around 100 jobs in Australia.

The partnership is expected to provide operational and cost benefits to both parties, promoting gategroup's services and allowing the airline to deliver a better catering experience to customers. By committing to one strategic supplier, it will also improve the efficiency and control of onboard food and drink offerings.

"gategroup's ongoing relationship with Virgin Australia further strengthens its position as a leading airline caterer in Oceania region, leveraging our commercial and retail innovations. It's an exciting time for the industry and for pushing boundaries on what inflight meals and services can be," said Xavier Rossinyol, gategroup chief executive officer.

Virgin Australia's resident chef, Luke Mangan, will also continue to work alongside gategroup to supply meals to business class customers.

Rob Sharp, group executive Virgin Australia Airlines, was similarly positive about the deal, stating it would "enable us to take our inflight dining experience to new heights".

This comes after a number of airlines, including Virgin Australia, stopped using Gate Gourmet's services in November 2017 after *Listeria* was found in its LAX kitchen facilities. A spokesperson for Gate Gourmet claimed the situation had been resolved and the airline was unclear if it resumed using the supplier on its outbound LAX flights. Despite this scare, Virgin Australia is committed to continuing the partnership over the coming years and Rossinyol claimed the deal marks "an exciting evolution" of their relationship.

"gategroup has been an excellent partner of ours for a number of years and we look forward to working with them more closely to provide the world's most rewarding travel experience," Sharp continued.

The partnership will take effect in late June 2018.



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Beating butter prices

High butter prices can't be absorbed forever and consumers will only wear a certain number of price rises.

Why is the price so high and what can you do about it?

Back in 2016 the price of milk fell below the production costs, Murray Goulburn (MG) slashed farmgate milk prices and the ball started rolling towards Saputo buying MG in 2018. With milk prices so low it seems counterintuitive that simultaneously butter prices are at all-time highs — between July 2016 and October 2017 the price of butter price rose 60%.

But butter needs milk fat and demand for milk fat is high. Value-add dairy products such as cheese and cream, which are in increasing demand in Asia and the US, rely on milk fat and are higher financial yielding for dairies than butter. There is not a lot of logic in this whole business; for example, cheese traditionally commands higher prices than butter even though it uses less milk in its production.

Demand for butter is increasing, partially driven by TV cooking shows that strongly advocate butter. Australian consumers are now buying more butter than margarine.

Also consumers are now turning back to full-cream milk, which is also reducing the quantities of milk fat available to churn into butter. Previously, a large proportion of the milk fat used to make butter came as a by-product from the production of skim milk. So, with skim milk production down, the available milk fat to make butter is likewise down.

Another factor involved in the lower milk fat availability is the use of lower grade feed stock to feed herds. This product results in lower yield of milk fat from the herd.

Prices for buttery products like croissants have increased to partially cover increased butter costs but consumer resistance

to price hikes and manufacturer inability to absorb higher ingredient costs mean that alternatives are needed.

Butter alternatives need to meet certain criteria if they are to work in your kitchens and processes:

- Same melting point as butter — 30°C
- Buttery flavour and aroma
- Same fat content as butter — 83.5%
- Same moisture content as butter — 16%
- Salt — 1%
- Direct replacement in recipes, ie, same weights and measurements
- Even, yellow colour
- Smooth texture at ambient temperature
- Suitable for partial or complete replacement of butter

Vegetable shortening can be used as an alternative to clarified butter. One such product, Peerless Food's Shef, claims a few points that make it more user-friendly than clarified butter. Firstly, users don't have to 'clarify' the product. With butter, users must render the butter so that its water content evaporates and milk solids separate and then skim off the milk solids — none of this is needed with Shef. Also the vegetable shortening does not spatter when frying and, with its high smoke point, is less likely to burn than comparable products. It is also suitable for vegans and Halal products.

So there are ways that food manufacturers can circumvent the slippery slope of butter price increases. 🐮

Peerless Holdings
www.peerlessfoods.com.au



Soupper the key to success



The key to success in any commercial kitchen is good equipment. Soupper kettles are efficient and programmable kettles that offer a wide range of functions that simplify processes and reduce manual labour in the kitchen.

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Heat-treated flour addresses food safety

Children have often been caught trying to pinch a bit of raw cookie dough from the mixing bowl, only to be reprimanded and told it was unsafe. This may be about to change with Page House launching heat-treated flour for American households.

Food products containing raw ingredients pose the risk of *E. coli* and other harmful bacteria, but once they are killed in the cooking process the product becomes safe for consumption. While the danger of getting *Salmonella* from raw eggs is well known, raw flour is often wrongly assumed as being safe to eat.

In 2016, 63 people from 24 states became ill from an outbreak of *E. coli* linked to raw flour. This resulted in 10 million pounds of flour being recalled, as well as baking mixes and foods containing this flour.

The outbreak of illnesses prompted the Center of Disease Control (CDC) and the Food and Drug Administration (FDA) to warn consumers against eating raw dough or batter in any form, including cookies, tortillas, pizza, biscuits, pancakes or crafts made with raw flour.

Food manufacturers have avoided these food safety risks with the use of heat-treated flour, but households have previously not had access to these products. With the popularity of raw recipes increasing, this has highlighted the need for safer food options. Page House recognised the gap in the market and has responded by offering consumer-packaged heat-treated flour.

The flour is exposed to heat through a treatment process which eliminates harmful bacteria. In the interest of food safety and transparency, each batch of flour is tested and the results are published publicly for review.

Page House's heat-treated flour will be available in mid-April and will help ensure the safe handling and eating of raw recipes, especially around children who fail to understand the dangers of raw ingredients.



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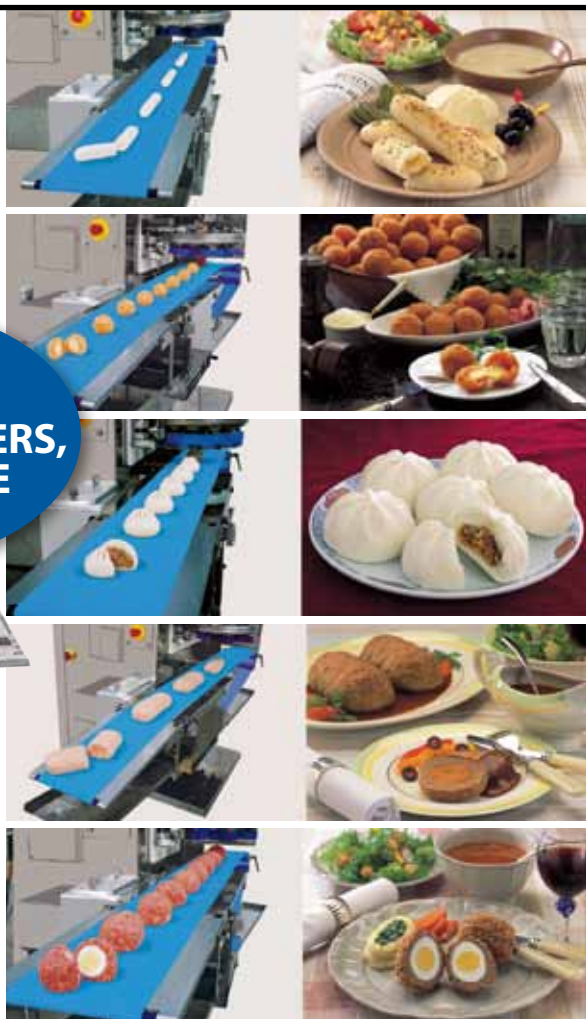
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Butter alternative

If rising butter costs are affecting your bottom line then Pura Shef-pro premium butter replacer is a cost-saving alternative to butter. Specially developed from tallow, with the same characteristic fat level, melting point, colour, flavour and aroma of butter, it is suitable for total or partial butter replacement in many applications.

The product is suitable for bakery, prepared food (commercial kitchens/small food processors) and foodservice applications such as sauces and fillings.

Product features include: characteristic buttery flavour and aroma, smooth texture at ambient temperature, uniform yellow colour, and same melting point and fat content as butter.

Available in 15 kg cartons, Pura Shef-pro can be used at the same recipe weights and measurements.

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Consumers will pay more for unhealthy foods

We'll pay more for unhealthy foods when we crave them, new neuroscience research finds. The study also shows that we're willing to pay disproportionately more for larger portion sizes of craved food items.

The research, which appears in the journal *Proceedings of the National Academy of Sciences (PNAS)*, identifies an obstacle to healthy living.

"Our results indicate that even if people strive to eat healthier, craving could overshadow the importance of health by boosting the value of tempting, unhealthy foods relative to healthier options," explained Anna Konova, a postdoctoral researcher in NYU's Center for Neural Science and the paper's lead author.

"Craving, which is pervasive in daily life, may nudge our choices in very specific ways that help us acquire those things that made us feel good in the past — even if those things may not be consistent with our current health goals."

There is growing interest across several sectors — marketing, psychology, economics and medicine — in understanding how our psychological states and physiological needs affect our behaviour as consumers. Of particular concern is craving, which has long been recognised as a state of mind that contributes to addiction and, in recent years, to eating disorders and obesity.

Yet, the researchers note, little is known about the nature of craving and its impact on our choices and behaviour.

In their PNAS study, the scientists conducted a series of experiments that asked subjects to indicate how much they'd


pay for certain snack foods after they developed a craving for one of them — significant differences in a desire for a specific food item (eg, a Snickers or granola bar) before and after exposure to the item constituted cravings.

The results showed that people were willing to pay more for the same exact snack food item if they were just exposed to it and asked to recall specific memories of consumption of this item, relative to before this exposure. Notably, this occurred even if the study's subjects were hungry before and after the exposure, suggesting that craving and hunger are partly distinct experiences.

"In other words, craving Snickers does not make you hungrier, it makes you desire Snickers specifically," explained Louie, who adds that there was also a spillover effect as it applied, to some degree, to similar food items that subjects were never exposed to (eg, other chocolate, nut and caramel candy bars).

Moreover, the researchers found stronger effects — bigger changes in the willingness to pay for an item the subjects craved — when the items were higher-calorie, higher-fat/sugar content foods, such as a chocolate bar or cheese puffs, relative to healthier options such as a granola bar.

Finally, the experiments revealed a connection among craving, portion and price. That is, people were willing to pay disproportionately more for higher portion sizes of the craved items.

"It appears that craving boosts or multiplies the economic value of the craved food," said Konova. 



Award for foodservice condiment packaging and dispensing system

The Cryovac FlexPrep dispensing system, which delivers portion-control and improved food safety to the application of condiments, has been awarded the 2018 Kitchen Innovations (KI) Award presented by the National Restaurant Association, Hotel-Motel Show in the US.

The Cryovac FlexPrep system changes the way back-of-house condiments and sauces are packaged and dispensed, changing out paperboard or other rigid canisters for flexible pouches. Pre-filled Cryovac FlexPrep pouches are inserted into a proprietary dispensing unit with ergonomic handles and a clear plastic cylinder that allows up to 98% evacuation.

From a food safety perspective, the contents of a Cryovac FlexPrep pouch are hermetically sealed with no headspace in Cryovac oxygen barrier film and do not come in contact with human hands, cutting tools or other utensils during kitchen operations.

When compared to current foodservice condiment packaging options, the dispensing system delivers improved portion control and food safety, better optimised shipping cost and better utilisation of storage space, as well as decreased packaging and condiment waste.

Qantas is going native — well a bit

Qantas is embracing native Australian ingredients as a fundamental part of its decision to showcase some of the country's best local producers.

The airline's in-flight snack range includes Charlie's Cookies — a specially curated range of shortbread Artisan Bites featuring finger limes and Byron Bay Cookie Company-owned Lukken & May's Butterburst biscuit range with Davidson Plums.

The native ingredients for both snacks are supplied by The Australian Superfood Co (TASC). Hayley Blieden, TASC's MD, explained that the partnership with these local biscuit companies and Qantas is a significant stepping stone for TASC and also re-enforces the company's vision to raise awareness and recognition of the ingredients themselves.

Having these ingredients onboard flights offers a platform for flavours that would otherwise be quite unfamiliar to the average consumer and is an effective way to connect native Australian ingredients with people who can learn about their gourmet and nutritional value, as well as the cultural knowledge behind them.

The Finger Lime Artisan Bites and Davidson Plum Butterburst Biscuits are currently available on Qantas domestic flights and will be served until September.



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More nutritious food needed in aged-care homes

Catering in aged-care homes has been criticised for a number of reasons including poor nutrition, small portion sizes and failing to meet individual requirements.

Bernadette Eriksen has been fighting to improve the lives of seniors and people suffering from swallowing disorder dysphagia by manufacturing nutrition-based food products suitable for their needs. She suggested nursing homes should do more to ensure that seniors are getting the quality food they deserve while maintaining their health and dignity.

Referring to her Brisbane-based company Flavour Creations, she said, "It's what started me off in this business 20 years ago and, sadly, some practices have not changed.

"There is no excuse for serving up food that doesn't provide the correct nutritional requirements. What's worse, some facilities serve food that can't be eaten at all or can even cause choking because the residents have a swallowing disorder."

According to research from Monash University, there has been a 400% increase in preventable deaths over the past



decade in Australian nursing homes, and choking accounts for 8% of those deaths.

Eriksen has begun to receive recognition for her efforts, winning three awards last year: the 2017 Telstra Queensland Business Woman of the Year, the 2017 Telstra Entrepreneur Award and the Greater Brisbane Woman in Business of the Year Award 2017.

She noted the possibility that cheap operators may undercut the residential aged-care facilities that do prepare good quality food.

A recent study by Bond University also revealed that Australian care homes spend \$6.08 a day to feed a resident, whereas an average of \$8.25 is spent per prisoner per day on food.

While some assume that cutting food budgets benefits the system, the negative health implications associated with poor nutrition could cause much higher costs than merely investing in good quality food in the first place.

"Families have got to take a stand on this and insist that their loved ones are served food that meets their dietary and health needs and actually looks and tastes good," she said.

Image courtesy of Flavour Creations

Nestlé releases chocolate bar with 30% less sugar

Nestlé has responded to consumer demand by creating a new, healthier chocolate bar called Milkybar Wowsomes.

Based on its iconic Milkybar brand, Milkybar Wowsomes contain fibrous crispy oat cereal and have 30% less sugar than a regular chocolate bar. Taking inspiration from candy floss, Nestlé scientists restructured sugar to create a more aerated version that tastes equally as sweet but dissolves faster.

This sugar reduction technique was announced in 2016, and it took scientists in the UK, Switzerland and the Czech Republic just over a year of research and development to convert it into a commercially available product.

Since it contains more natural ingredients and no artificial sweeteners, preservatives, colours or flavourings, this will appeal particularly to parents looking to provide a healthier version of their children's favourite confectionery.

"We announced earlier this month that we have taken out more than 60 billion calories and 2.6 billion teaspoons of sugar from across our food and drink portfolio in the last three years. A new product like Milkybar Wowsomes introduces greater choice and allows parents to treat their children with chocolate that tastes

great but has less sugar. We are demonstrating how we can, and will, contribute to a healthier future and that we take our public health responsibilities very seriously," said Stefano Agostini, CEO of Nestlé UK and Ireland.

In the 'Contributing to a Healthier Future' report, Nestlé UK and Ireland explained that recipe changes — such as making milk the number one ingredient in Milkybar — are partly responsible for this huge reduction in calories and sugar.

The company has already achieved a 7.4% sugar reduction in its confectionery and it aims to increase this to 10% to deliver on its 2017 pledge.

"We will continue our work and take this technology further so that we can

deliver more confectionery products that taste great and are better for our consumers," said Jas Scott de Martinville, global lead for Nestlé Confectionery Research & Development.

Nestlé also plans to extend this sugar technology to other chocolate brands, and although this move will not transform the confectionery industry overnight, it sets the precedent for other companies to follow suit in creating healthier treats.



Image courtesy of Nestlé

Particle size analysis of chocolate powder



Chocolate is actually a mix of powders, which first gets liquefied, then hardened and finally moulded during the production process. The process is complex and needs to be optimised with regards to the high costs of the raw materials.

To make chocolate, cocoa liquor is milled together with excess cocoa butter and additives, such as sugar and milk powder. Particle size affects the production process and final properties of chocolate in many ways. One of the most important economic aspects in chocolate manufacturing is its viscosity, which increases as the particles become finer. By optimising particle size distribution (PSD), the manufacturer can also reduce the proportions of viscosity modifiers needed in the chocolate, thus indirectly influencing quality.

A more direct way to influence quality is to reduce the size of sugar, milk, and cocoa particles to sizes <30 µm, as

larger particles feel gritty in the mouth. The human tongue is very sensitive, and differences in particle size as small as 3 µm can consistently be detected. In conclusion, a narrow PSD is desirable to preserve the smoothness of the texture and taste from the negative influence of larger particles, and to prevent the smallest particles from impairing the flow properties. Since controlling the PSD will allow the manufacturer to both increase quality and reduce production costs, a reliable method for particle size analysis of chocolate powder is crucial.

The Particle Size Analyser PSA 1190 from Anton Paar is able to perform measurements on sugar, milk powder and chocolate powder — including much bulkier agglomerated chocolate powder used in the preparation of instant hot chocolate. Dry Jet Dispersion technology ensured adequate sample dispersion under low air pressure, which is especially important for the fragile chocolate powders.

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Phages to fight food poisoning

It is possible that bacteriophages, bacteria-killing viruses, could be used to hunt down and kill bacteria that cause food poisoning and for food processors to routinely use phages for decontamination.



"Our study can serve as a model for the prevention of other, more serious foodborne infections through phage treatment," says Professor Mikael Skurnik.

As each bacteriophage strain only infects a handful of bacterial species the 'phage weapon' can be honed to be very specific in the bacterial species it hunts and kills.

At the University of Helsinki, Professor Mikael Skurnik has been studying bacteriophages and phage therapy for a long time, and his work is becoming increasingly relevant as bacterial resistance to antibiotics is becoming endemic.

Skurnik is now cooperating with researchers at the Seoul National University in South Korea, in investigating the possibility of utilising phages to eradicate foodborne pathogens and so prevent food poisoning.

The researchers focused on the *Yersinia enterocolitica* bacterium, which is transmitted through raw or undercooked pork or, more rarely, milk and causes yersiniosis. Utensils or equipment contaminated with the bacteria can also be a source of the disease.

The disease is trans-global and symptoms include fever, abdominal pain and diarrhoea. In some cases, yersiniosis may cause arthritis as a secondary disease.

Treat the food, the utensils and the equipment

Four bacteriophages that infect the *Y. enterocolitica* bacterium were identified by the researchers. The most effective of this quartet was the fHe-Yen9-01 phage so it was selected for the next stage of the study where its efficacy in decontaminating food and kitchenware contaminated by bacteria was investigated.

"We focused on those foodstuffs that most often transmit infections, as well as those kitchen utensils most often used to handle these foodstuffs," said Skurnik.

Everyday products available in grocery shops, such as raw and grilled pork, as well as milk, were inoculated with

Y. enterocolitica. The contaminated food was then subjected to phage treatment, after which the number of both bacteria and phages was monitored for three days.

"Phage treatment was effective in inhibiting bacterial growth in food, while the number of phages in the food grew, indicating that phages infect bacteria and grow in them also when refrigerated," said Skurnik.

Next, the researchers inoculated kitchen utensils, such as wooden and plastic cutting boards, knives and surgical gloves, with the bacteria and phages, after which the number of bacteria and phages in the utensils was monitored for two hours. In this case as well, the phages effectively inhibited bacterial growth.

Will decontamination by phage become routine?

To the best of Skurnik's knowledge, corresponding studies on the application of phages in food treatment have not been conducted previously but treatment with phages is not a novel idea. In the United States, a phage product already on the market is sprayed on raw food products to prevent *Listeria* bacteria growth.

"In Finland, there is no urgent need to prevent *Yersinia* infections, but our study can serve as a model for the prevention of other, more serious foodborne infections through phage treatment," said Skurnik.

In the future, decontamination with phages may well be part of the routine in processing food.

"One option is a phage mixture effective against several bacteria, such as the *Salmonella* and *Campylobacter* species, as well as the most common food poisoning bacteria in the gut. This mixture could also be administered in a preventive manner to farm animals, for example, mixed in their drinking water," suggested Skurnik.



MAP leak testing system

MOCON is expanding the availability of its Dansensor LeakProtego leak testing system, which has been developed to help food processors ensure that individual modified atmosphere packages (MAP) do not have undetected micro leaks. The product has been engineered to test for potential leaks at low levels.

Currently, most food processors test for leaks when the product has already been placed into cases or shipping crates. Because MAP leaks degrade shelf life, compromise product safety and negatively impact brand image, MOCON's goal was to develop an inline system that provides food processors with package integrity information further upstream.

The LeakProtego uses a sensing system with CO₂ as a trace gas to detect leaks down to 50 µm. The technology relies on modular units, each of which can test up to 12 packages per minute. Multiple modules can be combined so that individual package testing can keep up with MAP equipment output. The modules provide processors with critical information such as individual leak size and rate so that production line optimisation can be made quickly.

The system is not sensitive to changes in the plant environment, such as variation in surrounding CO₂. Typical applications include MAP pasta, bread, cheese, sliced meats and ready-to-eat meals.

Pryde Measurement Pty Ltd

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Chemical analysis of wine

Chemical analysis during all phases of the winemaking process is required to help ensure the quality of the finished product. Winemakers will consider a variety of parameters including acids and acidity, sugars, pH, Sulphur and alcohol.

CDR WineLab enables onsite testing, with results available in just minutes, allowing faster decisions to be made during the vinification process. It is suitable for wineries of any size, and can be run even without previous laboratory experience.

Performing chemical analyses on wine and must is simple and fast. Wine is analysed as is, while must just requires a basic sample prep. The equipment includes a photometric analyser which is capable of testing up to 16 samples at a time. Reagents are provided in ready to use format and also have the added benefits of avoiding toxic chemicals, fume hoods and washing up of glassware.

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Accurate food allergen tests are urgently needed to help reduce the risk of food labelling errors. Traditional test methods include polymerase chain reaction (PCR) or immunoassay-based approaches (ELISA) but the complexity of food matrixes means that these methods can present accuracy problems.

Now SCIEX's mass spectrometry (MS)-based method has received the First Action Official Method (FAOM) classification from AOAC INTERNATIONAL's Official Methods Board (OMB).

This sensitive method for analysing food allergens uses liquid chromatography coupled with tandem mass spectrometry (LC-MS/MS) to analyse a range of food products (both raw and baked goods) by detecting several unique signature peptides that are specific to each allergen.

The Allergen Screening method can detect allergenic peptides from five of the major classes of allergenic foods at a detection limit of 10 ppm in a variety of food matrices. Plus, with increased throughput, the ability to identify multiple key allergens at once from a number of different food types and advanced peptide signature detection, it greatly reduces the chance of false negative and false positive results.

SCIEX's method uses the QTRAP 4500 LC-MS/MS System for high-throughput trace screening and quantitation of allergens. LC-MS/MS enables comprehensive sample data analysis, claiming to make food allergen analysis more accurate and, ultimately, safer for consumers.

Following the FOAM classification, AOAC will initiate a two-year assessment of SCIEX's method. If the method's performance satisfies the review panels, the AOAC will make a recommendation to the OMB for a Final Action Method status. This final status would raise the method's profile as a chemical analysis process, leading to its further adoption worldwide and an increase in consumer reliability on food allergen information. 

Researchers develop faster gluten detector

The number of people suffering from coeliac disease and gluten sensitivities has been increasing, causing the food industry to develop more food options to suit their needs. But some individuals continue to suffer from symptoms even after consuming foods that claim to be 'gluten-free'.

Current tests that detect gluten in food are failing to identify all of the substances, meaning products may be wrongfully labelled as gluten-free. Researchers from the University of Minnesota recognised this could be a major health concern and developed an alternative gluten detector that can supposedly measure different sources of gluten quicker than current systems.

Gluten is a collection of proteins commonly found in wheat, barley and oats. The benchmark used to detect the levels of these proteins in foods is the enzyme-linked immunosorbent assay (ELISA), but there are a number of problems associated with this system.

Not only can it be inconsistent and can provide false negatives, but a different ELISA is needed to detect each type of gluten — barley, wheat or oat. This is because some people may be sensitive to proteins from one source but not another. Other tests are also ineffective; DNA-based sensors are not accurate, and mass spectrometry is costly and requires technical expertise.



Published in *ACS Sensors*, researchers created an immunological assay based on floating gate transistors (FGT).

The American Chemical Society explained: "Their test is in a device that includes tiny microchannels for a sample to move through. If a sample contains

gluten, the substance can bind to one of three capture agents, which can be antibodies or a DNA-based aptamer, that specifically latch onto gluten proteins from certain sources. This binding causes a shift in the voltage readout of the transistor and can provide a chemical fingerprint that tells researchers whether the gluten was from barley or wheat, for example."

With fewer processing steps and automated sampling, this sensor produces results 45 minutes faster than the ELISA. The FGT sensors can still detect less than 20 parts per million (ppm) of gluten. According to the U.S. Food and Drug Administration, this is the most unavoidable gluten that is allowed in food in order for it to be labelled gluten-free.

The Food Standards Code, on the other hand, states that foods that test below 200 ppm are considered low-gluten, and gluten-free is when there is no detectable gluten.

A more effective, faster gluten detector should help address the growing demand for low-gluten and gluten-free food options.

Food Analysis



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How heat kills *Salmonella*

Very high temperatures kill living cells very quickly but what causes bacteria like *Salmonella* to die at lower temperatures and can this information be useful to food processors?

Better flavour, better nutritional quality and energy savings are all achievable if foods and beverages are processed at lower temperatures. But, and this is a very big but, the safety of the product being made must be paramount and this must not be compromised by the use of lower processing temperatures.

A team of Penn State researchers wanted to understand how heat kills bacteria so they could optimise food processing techniques. The team was aware that bacteria develop ways to cope with heat shock and wanted to establish what actually kills them.


Aida Ebrahimi, Assistant Professor of Electrical Engineering at Penn State, determined that mild heat stress at temperatures around 50°C damages the bacteria's cell wall without rupturing it. The elevated temperatures caused the lipids in the cell walls to vibrate, making the walls less stable and allowing small molecules to escape.

Some of the leakage molecules carry a charge and so change the electrical conductivity of

the solution around the bacteria changes. The team used droplet-based electrical sensors that had been developed by Ebrahimi, when she was a doctoral student at Purdue University, to measure the change in conductivity in the growth medium.

After multiple experiments using both wild-type and heat-resistant *Salmonella* bacteria and correlating the electrical results with fluorescence measurement and standard microbiology protocols, the team came up with some interesting results that have relevance for food and beverage processors.

More energy was required to make the cell membranes of heat-resistant *Salmonella* permeable to the small molecules — explaining how the bacteria cope with heat shock.

More interesting still, the team established that the heating method affects the bacterial kill rate. Having looked at heating time and heating method, either a slower ramp-up of heat or a sudden pulse of heat, the team found that pulsed heat was more effective at killing bacteria. 



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Robo-picker can think for itself



Smarter than traditional 'pick and place' robots, a newly developed robo-picker prototype decides how to grasp an object, then picks it up, determines what it is and where it should be placed and then puts it there. Ultimately, this robotic system could be extremely useful in warehouse sorting and other picking and clearing tasks.

MIT and Princeton University engineers who developed the system received some sponsorship from ABB, Mathworks and Amazon.

Their system consists of a standard industrial robotic arm outfitted with a custom gripper and suction cup. An 'object-agnostic' grasping algorithm enables the robot to assess a bin of random objects and determine the best way to grip or suction onto an item amid the clutter, without having to know anything about the object before picking it up.

Once grasped the robot lifts the selected item from the bin and a set of cameras then takes images of the object from various angles. The robot compares these images with a library of other images to find the closest match and so identifies the item. Once identified the item can be stowed in the appropriate place.

The 'grasp-first-then-recognise' workflow turns out to be an effective sequence compared to other pick-and-place technologies.

Building a library of successes and failures

Currently, most pick-and-place systems are designed to function only in tightly controlled environments with the robots performing one one specific, repetitive task, such as gripping a package off an assembly line, always in the same, carefully calibrated orientation.

The robo-picker technology, however, will enable the robots to be more flexible, adaptive and intelligent. They will become able to work in unstructured settings where they will be able to recognise and sort thousands of items from the clutter.

How to grasp the object

The researchers employed four main grasping behaviours:

- Suctioning onto an object vertically.
- Suctioning onto an object from the side.
- Gripping the object vertically like the claw in an arcade game.
- Gripping vertically, then using a flexible spatula to slide between the object and the wall (for objects that lie flush against a wall).

The robots were shown images of bins cluttered with objects, captured from the robot's vantage point. Then the robots

were shown which objects were graspable, with which of the four main grasping behaviours, and which were not, marking each example as a success or failure. After hundreds of trials a library of picking successes and failures was created. This library was incorporated into a "deep neural network" — a class of learning algorithms that enables the robot to match the current problem it faces with a successful outcome from the past, based on its library of successes and failures.

Ultimately, the robots knew how to predict which items were graspable or suctionable, and which configuration of these picking behaviours was likely to be successful. Once gripped and away from the clutter it was easier for the robots to recognise items ready for stowing.


From pixels to labels

A perception system was developed in a similar way to the grasping algorithm, enabling the robots to recognise and classify objects after they had been grasped.

To do so, they first assembled a library of product images taken from online sources such as retailer websites. They labelled each image with the correct identification — for instance, duct tape versus masking tape — and then developed another learning algorithm to relate the pixels in a given image to the correct label for a given object.

Last July, the team packed up the 2-ton robot and shipped it to Japan, where, a month later, they reassembled it to participate in the Amazon Robotics Challenge, a yearly competition sponsored by the online megaretailer to encourage innovations in warehouse technology. Sixteen teams took part in a competition to pick and stow objects from a cluttered bin.

In the end, the MIT/Princeton robot had a 54% success rate in picking objects up using suction and a 75% success rate using grasping, and was able to recognise novel objects with 100% accuracy. The robot also stowed all 20 objects within the allotted time.

The team is now working to further improve the pick-and-place technology, particularly speed and reactivity. Tactile sensors have been added to the robot's gripper and a new training regime is already underway. 

Sanitary conveyors

Designed to fit within existing sanitary flange piping systems and convert into a conveyor for waste, parts and bulk materials, EXAIR's Sanitary Flange Line Vac can be used to convey materials in systems that require frequent or mandatory cleaning.

Constructed of Type 316SS to provide corrosion resistance and cleanliness, these flanged Line Vacs limit entrapment areas where bacteria can grow and the clamp-style sanitary flanges are compatible with ISO 2852. Conveying rates are easy to control by regulating the compressed air supply pressure. No moving parts or electricity assures maintenance-free operation.

Applications include: material conveying, part transfer, waste/trim removal, hopper loading, filling operations, chip removal and fibre tensioning.

Advantages include: ISO 2852 compatible, type 316SS construction, fits standard sanitary flanges, four sizes available, no moving parts, compact, high throughput capability, quiet and CE compliant.

The Sanitary Flange Line Vac conveyors are offered in four common flange sizes: 38, 51, 64 and 76 mm. All metal parts are made from Type 316SS.

EXAIR's complete series of Line Vac compressed air operated conveyors are available in a wide range of sizes and materials, including aluminium, type 303SS and type 303SS. High Temperature Line Vac models are available for applications involving temperatures up to 482°C. Wear-resistant Heavy Duty Line Vac models can convey high volumes over longer vertical and horizontal distances.

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Vibratory conveyor for integration with metal detector

Key Technology's Iso-Flo vibratory conveyor is designed specifically for integration with a metal detector to inspect bulk foods on processing and packaging distribution lines. Compared to traditional plastic or fabric belt conveyor systems integrated with metal detectors, it is said to reduce maintenance and minimise product spillage while improving sanitation to maximise food safety.

With the latest sanitary design features, the vibratory conveyor combines three conveyor bed sections — a stainless steel infeed, a nonmetallic section that passes through the metal detector's aperture and a final stainless steel section with a reject device. Each system is designed to accommodate the user's preferred metal detector and aperture size. The infeed section can incorporate a screen capability to scalp or remove fines, small particles or water. Reject device options include a pneumatic gate within the shaker bed that opens and closes or a slide chute at the discharge of the shaker bed that switches direction if metal contamination is detected.

The stainless steel conveyor beds feature a standard rotary polish within the product contact zone or one of several optional finishes. The finish reduces bacterial attachment and biofilm formation. Oil-free drives, elastomer isolators, scalloped flat bars, stainless steel ground arms and minimal laminations help maximise equipment hygiene.

Unlike plastic or fabric belt conveyors with hidden surfaces that can trap bacteria, the product presents sanitary bed surfaces that are easy to clean. With no belting material, drive or discharge pulleys and no bearings, drive belts or sprockets, the system is designed to minimise maintenance and maximise uptime.

It is suitable when inspection is needed for frozen fruits and vegetables at the discharge of the freezer and for blanched fruits and vegetables prior to canning, as well as for frozen meat and poultry, shredded cheese and other applications.

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Zero-backlash servo gearmotor

maxon motor has released a servo motor and gearhead combination that can produce 364 Nm with a peak torque rating at the output of 686 Nm. Fitted with both an encoder and a holding brake inside the IP-rated motor's rear enclosure, the combination can move heavy loads into position and make sure they stay there.

The high acceleration of the brushless DC motor with high-grade neodymium magnets enables a zero to 2600 rpm speed change in under 4 ms. Being both brushless DC and slotless gives the motor zero cogging or position detent for smooth position transitions and low-speed performance.

The solid construction and sealed nature of the motor drive components makes it suitable for mining, food, process control and manufacturing environments. Customisation of the motor and gearhead features is possible and both 24 and 48 VDC supplies can be used. The unit is compatible with standard servoamplifiers and position controllers from maxon motor.

maxon motor Australia Pty Ltd

www.maxonmotor.com.au

Pneumatic deflection elbows

HammerTek Smart Elbow deflection elbows are used in pneumatic conveying systems to prevent elbow wear, material degradation, melting or streamers and build-up associated with material impacting the wall of conventional sweep elbows and plugged tees.

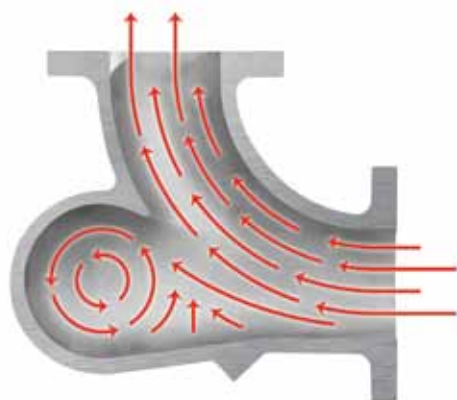
The elbow features a spherical chamber that protrudes partially beyond the desired 90° or 45° pathway, which causes a ball of material suspended in air to rotate, gently deflecting incoming material around the bend without impacting the elbow wall or generating heat.

The design prevents abrasive mining, concrete and reinforced plastic materials from wearing through the elbow wall, and friable products from degrading and generating dust, while preventing the frictional heat that causes plastic streamers and build-up of heat-sensitive materials on conventional elbow walls.

Engineered for dilute-phase and dense-phase pneumatic conveying, the elbows are offered in cast iron, carbon steel, aluminium, stainless steel and special alloys in 90° and 45° bends, with flanged and socket-weld ends in tube, schedule 10 pipe and schedule 80 pipe diameters from 32 to 457 mm.

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D'Orsogna starts new \$66 million plant in Victoria

Western Australian smallgoods and meat protein company D'Orsogna has begun construction of a \$66 million, state-of-the-art 10,858 m² food manufacturing facility just north of Melbourne.

Currently D'Orsogna employs more than 550 people and is one of the most recognisable brands at Woolworths, Coles, Metcash and foodservice businesses across Australia.

The new Victorian facility will employ 240 people and establish D'Orsogna as a national market leader in the food sector.

D'Orsogna first established a manufacturing footprint at Mt Waverley, 16 km south-east of Melbourne's CBD, 10 years ago.

"D'Orsogna has consistently experienced year-on-year growth and the new facility will provide a larger production capacity and greater product development opportunities," said Brad Thomason, D'Orsogna's managing director.

"The new Melbourne site will double our production capacity and manufacture a range of innovative ham, bacon and other meat protein products."

Currently headquartered in Perth, the company produces a range of cured and cooked whole and sliced hams, gourmet continental goods, bacon, and cooked and fresh sausages. The WA facility will retain its head office status, staff and production.

The company has finalised the design of the new greenfield facility, which will incorporate the latest energy and water conservation technology. A focus on sustainable and efficient processes has driven the design, ultimately increasing production capacity.

"We anticipate a large percentage of our expanded production capacity will be produced out of the new Victorian facility, due to its proximity to major markets and its streamlined manufacturing processes," Thomason said.

"The throughput, or productivity per square metre of floor space, will be leading edge, allowing D'Orsogna to stay competitive and satisfy growing consumer demand for fresh, conveniently packaged, modern meat protein products."

D'Orsogna currently supplies Woolworths, Coles and Metcash stores around Australia. The new facility will far exceed the standards for export approval and the Southeast Asian market will become a focus in the medium term.

"There's the opportunity to expand the facility in planned stages. Convenient access to transport arteries and major markets in Victoria, NSW and Queensland will mean we can deliver D'Orsogna products quicker and at a lower cost than current logistics allow," said Thomason.

"We chose Victoria for its competitive operating environment, reputation in foods, access to key transport infrastructure and rapidly growing local and export markets, and we appreciate the support of the Victorian Government and City of Hume in helping us establish and expand our presence here.

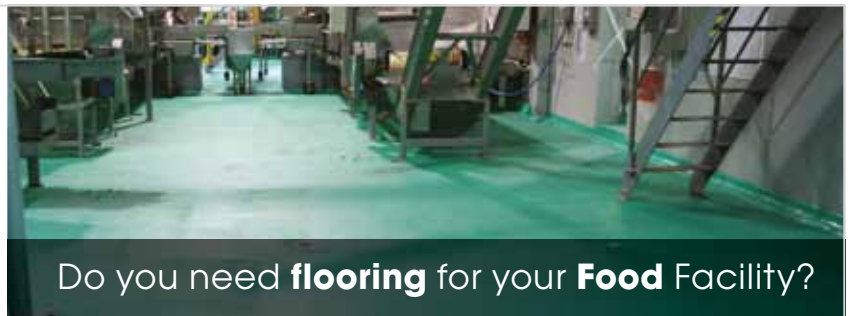
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Laser barcode scanners

SICK's CLV6 series laser barcode scanners are suitable for use in food production processes where hygiene is crucial, including wet areas. Their tough, stainless steel housings have an IP69K rating and can withstand harsh conditions.

The stainless steel housings are resistant to chemicals and corrosion, as well as being fully leakproof. The design includes a low level of surface roughness; smooth, rounded edges; and special housing and fastener shapes, meaning no residues can form on the outside of the scanners.

An additional double sheath protects the cable entry points and plugs. Even sudden reductions in temperature do not affect the scanners.

The CLV61x, CLV63x and CLV65x product families are fitted with heaters and the CLV69x models have a heated front screen. The devices can operate without problems at average temperatures of -25°C. When a scanner is exposed to constantly changing temperatures, the front screen heater prevents the reading window from misting up.

Their reading performance makes the barcode scanners with integrated heaters suitable for use in frozen food production processes. They have a good depth of field, which is further increased in the CLV65x and CLV69x model ranges by a real-time autofocus function.

Because of the scanners' wide aperture angle, one device can cover the majority of conveyor belt width. Their reading properties and a fast reading rate help to ensure that the data is safely captured, even when the print quality of the barcodes is poor, the codes are damaged or films or other reflective surfaces have been applied over the top of them. Their high scanning frequencies of up to 1200 Hz allow for fast processor speeds.

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Standalone dust collector

A standalone dust collector from Flexicon removes airborne dust from upstream processes and discharges it into containers positioned below the collection hopper, protecting operators and improving plant hygiene, while eliminating material waste.

The housing is equipped with a 15 mm diameter side inlet port, dual filter cartridges, a 1.5 kW fan motor, a 70 L collection hopper with flanged slide gate valve and automated controls.

Any upstream process that generates dust can be vented to the system through hard piping or a flexible connection, drawing dust onto dual filter cartridges. At timed intervals, an automatic reverse-pulse filter cleaning system releases short blasts of compressed plant air inside the filters, causing dust build-up on the outer filter surfaces to fall into the hopper. Because the filters are blasted alternately at timed intervals with adjustable force, operation of the dust collection system is both continuous and efficient.

An indicator light on the control panel notifies the operator when the receiving hopper is full. The slide gate at the hopper outlet can be opened manually, allowing collected material to gravity discharge into a container.

The system's stainless steel housing and support structure, together with water-resistant controls and washdown-duty fan motor, allow rapid cleaning or sanitising of the entire unit between product runs.

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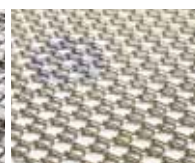
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Food hygiene starts on the plant floor

Kate Jennings



Floors and drains are an integral part of a food processing facility. Keeping them clean and therefore hygienic is paramount to reducing the risk of foodborne pathogens.

Recognising that the drain, gully and floor may need an upgrade is the first step to reducing the risks of a non-hygienic environment.

In food processing plants, floors can be exposed to water, grease and chemicals; heavy foot traffic; and hard-wheeled trolleys, pallet jacks and forklifts. The temperature range a floor can experience ranges from sub-zero freezers through to hot water washdown. As a consequence, drains, floors and the joints between the two elements can deteriorate and become impossible to clean. Cracks may develop in the sub-surface under the grate, the epoxy flooring may come away from the edge of the gully or stagnant water can pool in joins and crevices, all of which are potential sites for bacteria growth.

These scenarios are 'hygienic installation failures'. The most common is a hygienic failure, which is where the floor installation is compromised by a visible fracture, crack or

separation where microorganisms can be harboured and difficult to clean and disinfect. The other failure is a structural failure, which usually occurs after a hygienic failure event and often leads to a slip or trip hazard.

Once the facility manager has identified that the drain needs an upgrade it is important to consider how extensive the works need to be.

In most food processing facilities, the upgrade will depend on a few factors including the risk profile of the room, whether the equipment and drainage points meet the needs of the processing being conducted and if the production flow is at its optimal level. For older installations with ageing pipework, a complete overhaul may be necessary. It might be that the pipes are damaged terracotta or concrete, in which case it is an opportune time to bring the system up to current standards.

For food production that has a high risk profile, such as ready-to-eat meals, greater consideration will need to be given >

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A structural failure in a grate and floor has resulted in a reservoir of heavily contaminated wastewater hosting black pathogen-ridden residues on the underside, none of which can be effectively cleaned.

to ensure the facility has optimum hygiene standards.

Reworking layouts

If facility managers are looking to improve the efficiency of the production line, reworking floors and drainage layout is a good time to do so to ensure that the drains and gully points are in the right location for the equipment. I have seen an ice-cream factory where linear channels near the production line did not adequately capture condensate from the freezers. Relocating the drains nearer to the freezer alleviated the problem.

If during the upgrade the room is to be repurposed or new equipment installed, then it is a good opportunity to assess the overall layout of drains and equipment for optimal performance, without necessarily reworking in-ground pipework.

Floor and drain connection

The most common floor surface we see in food processing is epoxy, which gives facility managers better outcomes for floor hygiene. Where the floor and grate meet will always require special attention — is it correctly sealed, is the concrete surface underneath in good condition and does the grate sit flush or below the level of the floor so that water flows easily into it?

In some situations it is possible to replace the grate and drain with an epoxy connection without ripping up the whole

“Where the floor and grate meet will always require special attention”

floor. In this case, an appropriate epoxy bond between the new and old floor will be necessary. You may see a discontinuity because of the age of the floor, but the join will be fully sealed.

The other major consideration for the grate in particular is the traffic going over it. Food processing involves a lot of transportation on trolleys, pallet jacks and forklifts, all of which have different wheel profiles.

The grate needs to be able to withstand the weight distribution through the wheel — forklifts have large pneumatic tyres compared to smoke oven trolleys which have small, hard wheels. The smaller the wheel the greater the load through a single point to the grate. The size of the gap in the grate — the aperture — should also be considered as small wheels have the potential to get ‘stuck’ in larger apertures.

Making the decision to upgrade the grate and drain and potentially the floor is ultimately determined by the risk status of the food production undertaken. The key design points to consider are:

- Where does the water originate?
- Where does it need to discharge to?
- Does the drainage systems align with the needs of production?

Once these points are resolved, upgrades can be undertaken knowing that the function of the room is at its optimum and provides a safe environment for food processing.

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Kate Jennings, Product Manager with ACO Australia.

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Carcass disposal and food-animal disease outbreaks

Disease, cyclones, flooding, fire and blizzards can all result in animal health emergencies and the need to dispose of significant numbers of carcasses.

Jacek Koziel, associate professor of agricultural and biosystems engineering at Iowa State University, and a team of researchers analysed a method that could help livestock, poultry and egg producers deal more efficiently and safely with crises that lead to sudden increases in animal mortality.

On-site (usually on-farm) burial is the method most commonly employed for large-scale carcass disposal. This is low-cost and a fast way to reduce the spread of airborne disease and foul odours but such emergency burials can contaminate water resources with chemical and biological pollutants.

To overcome these problems, the researchers studied a hybrid disposal concept conceived at the National Institute of Animal Science in South Korea following a massive outbreak of foot-and-mouth disease in 2011. The method combines burial with aerobic digestion. The experiment also included burial trenches lined with flexible geomembranes. The researchers then injected low levels of air into the bottom of the trench to accelerate carcass decomposition and treat the resulting liquid contaminants.

The experiment tested the performance of the aerobic component of the hybrid method in a lab using tanks containing whole chicken carcasses, water and low levels of oxygen that occasionally dropped to zero.

Results of the study showed low levels of oxygen accelerated carcass decay significantly, reducing carcass mass by 95% within 13 weeks, while similar tests without air produced no noticeable decay.

Chemical contamination in the liquid waste met U.S. Environmental Protection Agency criteria for safe discharge to surface waters.

The hybrid method also eliminated two common poultry pathogens, *Salmonella* and *Staphylococcus*. Aeration also reduced odorous gases.

Is fake beef meat?

The US Cattlemen's Association (USCA) has declared war and fired the first salvo against the labelling of lab-grown or plant- or insect-derived "fake" meats as meat.

It has submitted a petition for rulemaking to the US Department of Agriculture's (USDA) Food Safety and Inspection Service (FSIS) requesting the agency to establish accurate beef labelling requirements to better inform consumers on the difference between beef products derived from cattle and those created in a laboratory.

The USCA insists that products from companies like Beyond Meat and Impossible Foods grown in labs or derived from plants or insects do not meet the definition of meat and shouldn't be labelled as such. Going further, the association claims that calling products "clean meat", "cultured meat" or "lab grown beef" constitutes unfair or deceptive trade practices.

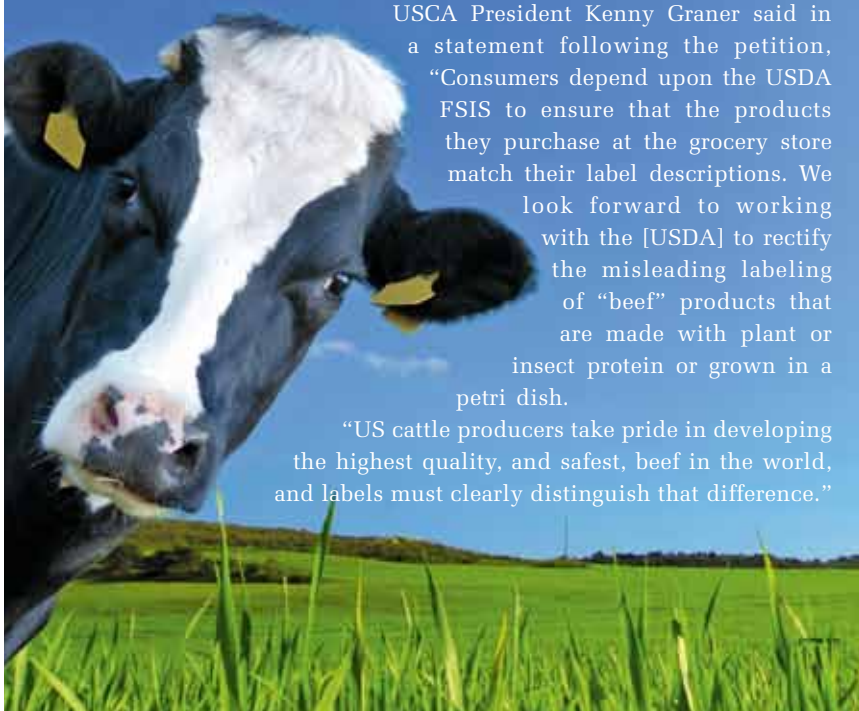
Beyond Meat's plant-based burger "looks, cooks and satisfies like beef" and is frequently stocked in the meat aisles in supermarkets. And this product is really only the harbinger of many more meat substitutes being available to consumers.

It is reasonable that product labelling does not confuse consumers. Consumers should be able to instantly understand whether the burgers that they are buying are beef, insect or vegetable and whether they are natural, organic, lab-grown etc. Mind you, the term natural is so fraught with confusion that it is hardly a useable word anymore.

The USCA's contention is that if a product is labelled "beef", it needs to come from cattle flesh.

USCA President Kenny Graner said in a statement following the petition, "Consumers depend upon the USDA FSIS to ensure that the products they purchase at the grocery store match their label descriptions. We look forward to working with the [USDA] to rectify the misleading labeling of "beef" products that are made with plant or insect protein or grown in a petri dish.

"US cattle producers take pride in developing the highest quality, and safest, beef in the world, and labels must clearly distinguish that difference."



Using augmented reality to improve meat grading

An American study of meat grading found that 50% of meat samples were mis-graded in some way.



This is not unreasonable as grading requires humans to repeatedly make objective and subjective judgments — something we are not particularly good at. Particularly when you consider all of the criteria addressed in grading carcasses.

The Meat and Livestock Australia (MLA) website gives the following criteria for grading carcasses:

- Body number and lot number.
- Carcase weight.
- Sex.
- Tropical breed content.
- Hanging method.
- Hormonal growth promotants.
- Ossification.
- Marbling.
- Rib fat.
- pH and temperature.
- Meat colour.

Other measurements that do not impact on eating quality can be taken at the customer's request, including:

- Eye muscle area (EMA).
- Fat colour.

MLA reports that producers and feedlot operators are regularly concerned about the precision of meat grading in Australia and this contributes to trust issues between producers and processors. With so many criteria to be considered it is no wonder that accuracy and consistency can be difficult to maintain.

To overcome this, MLA and Wiley have collaborated to explore how augmented reality (AR) technology can improve meat grading.

The collaborators have developed an AR platform, named ARGa (Augmented Reality Grading App), which facilitates faster, more consistent and more precise meat grading while taking full advantage of the experience and capabilities of the industry's meat graders.

The system uses computer vision to provide objective measurement and decision support for grading staff. ARGa is designed to distinguish the colour of a meat sample accurately and determine the area of the latissimus dorsi muscle and

introduce hands-free scanning of meat sample tickets. These features have been demonstrated on a Vuzix m300 augmented reality headset as well as on various handheld devices.


This project consisted of two phases:

- A research phase reviewing and cataloguing relevant augmented reality projects, case studies and technology.
- A proof of concept phase in which a prototype of an augmented reality application was developed for an AR head-mounted display and tasked with reducing the subjectivity in MSA grading in a processing environment.

Wiley R&D and Innovation Director Brett Wiskar said, "We are really excited to be working with MLA in research and innovation projects that will move the red meat industry forward into the digital era. We congratulate MLA on their foresight to investigate and invest in this technology."

Wiskar explained some of the benefits of the meat grading AR platform. "Decision assistance for meat graders may lead to improved transparency and consistent outcomes for the meat industry. Increased precision has obvious benefits such as accuracy on a carcass-by-carcass basis and broader labour efficiencies but there are also subtle flow-on positive impacts to the industry and processors. Decision support is likely to bring about greater speed and decreased training periods for meat graders. In addition, such a solution has the potential to normalise grading performance across shift duration, between graders, between facilities and across processor groups."

Both the augmented reality market and the platform developed through this research show substantial potential. The successful demonstration of a meat grading application in conjunction with the continuing development of augmented reality solutions make it reasonable to expect augmented reality to play a substantial role in the meat industry in years to come. This platform will have much further potential as the technology advances. Watch this space!

MLA and Wiley are now working together to prepare a submission on an augmented and virtual reality program for all of Australian agriculture. 

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food processor supplies

Whichfish site helps source seafood responsibly

Sourcing food responsibly and sustainably has become more important for the food industry, and now there is an online tool which can help businesses through this process.

Launched by the Fisheries Research and Development Corporation (FRDC), the website Whichfish.com.au informs businesses dealing with wild Australian seafood about the stock, environmental and management risks involved.

"Whichfish will make it easier for businesses to determine which seafood to source by providing them an independent assessment of the risks associated with wild caught Australian seafood," explained FRDC Managing Director Patrick Hone.

These risks can be monitored via the outlook section in each assessment, which shows whether they are expected to lessen, remain stable or worsen.

Although there are currently only 26 Australian species on the list, including Saddletail Snapper, Eastern King Prawn, Balmain bugs and Deepwater Flathead, more will be added throughout the year.

The company used Coles' Responsibly Sourced Seafood

framework in order to screen uncertified fisheries and identify major sustainability problems.

Species with third-party certification by a GSSI recognised scheme, such as the Marine Stewardship Council (MSC), are also displayed on the website, but the company insists the methodology used to apply the framework differs from an MSC Certification. According to the website, it uses elements from the GSSI Benchmarked MSC Standard version 2.0, but "is neither a duplicate of it nor a substitute for it".

"Coles recognises well-managed and responsible fishing is essential for future sustainability of our marine ecosystems, which is why since 2015 all our Coles Brand fresh, frozen, thawed and canned seafood has been responsibly sourced. We are delighted with the FRDC initiative, which will help continue the sustainability journey in our industry," said Coles Head of Quality and Responsible Sourcing James Whittaker.

The Whichfish site aims to help seafood traders make more informed decisions and promote safe and sustainable seafood. Since it is a pilot scheme, the FRDC encourages feedback and additional species suggestions.



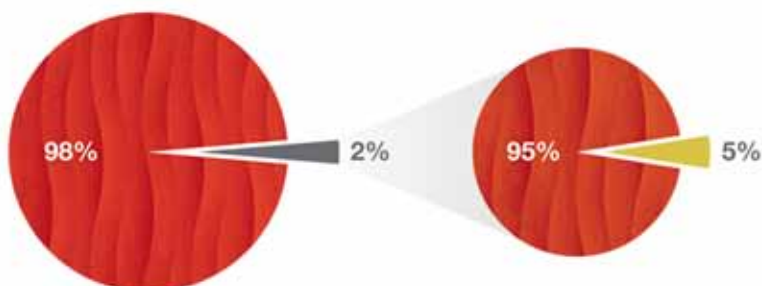
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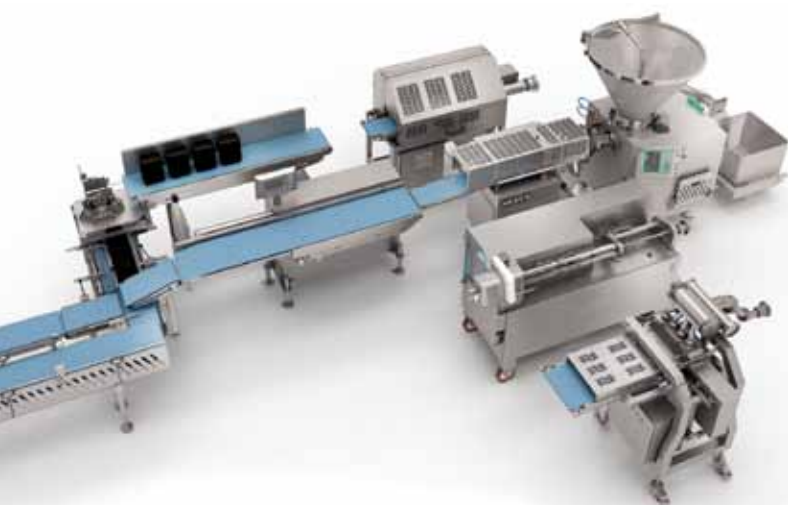
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Flexible fresh meat line

Vemag's flexible fresh meat line provides maximum flexibility in production, and instead of four lines previously required, there is now only one, which has reduced the cost as well as reducing space requirements to a minimum.

The fresh meat line consists of three sections. The vacuum filler with separation grinder as well as the loading system are fixed in position. Attachments have the same length and are interchangeable. They are suitable to produce burgers, Adana Köfte (Turkish ground lamb meatballs) minced meat, cevapcici, fresh grilling sausages, meatballs and many other specialties. The loading system switches to the stored packaging type fully automatically depending on the specialty being produced. On request, the burgers can be stacked, overlapped or arranged next to one another in the trays.

The interchangeable attachments include: the Forming Machine FM250 — the products from it are characterised by their high-quality texture and bite; the Minced Meat Portioner MMP223 for producing minced meat from beef, pork or poultry; the Automatic Meatball Loader AML273 produces round or elongated-shaped convenience products fully automatically and loads these into trays; the Flexible Sausage Line FSL210 offers flexible and accurate length portioning, linking and separating of sausages in natural and collagen casings.

Features of the meat line include: flexible use; more efficient production processes; suitable hygiene characteristics; may be used for all product groups; one filler for all applications; minimal space requirement; short set-up times; maximum utilisation of production time; minimal capital outlay; and short response times during production.

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Plant-based protein market booming

With consumers becoming more health-conscious, the demand for protein sources is increasing, but so are concerns for animal welfare and food transparency. All of these factors are contributing to the expanding plant-based meats market, which is predicted to reach \$5.2 billion by 2020 according to a Farm Animal Investment Risk and Return (FAIRR) Initiative report.

In collaboration with 57 investors, FAIRR's engagement report encouraged the food industry to diversify their protein offerings and analysed how 16 global food companies were responding to this growing demand.

Entitled 'Plant-Based Profits', it found that although all companies offer own-brand meat and dairy substitutions, Tesco and Nestlé were recognised in particular for embracing this change. Tesco has set specific targets to reduce its livestock emissions by 15% by 2030, had good communication with its investors and introduced a range of plant-based options at the beginning of 2018. Similar to Tesco, Nestlé had strong investor engagement, as well as a research and development network which concentrates on protein innovation, and it organises an annual protein summit.

Costco, on the other hand, was highlighted for its inadequate response to alternative proteins. Despite being one of the world's largest meat sellers, the company had poor protein diversification strategies, is facing opposition to its farming expansion and has not acknowledged its environmental impact.

Nestlé was also praised for its acquisition of Sweet Earth in 2017, making it one of three companies that have made acquisitions or investments to expand its plant-based product portfolio. The other two were Unilever, which is helping to develop plant-based steak, and General Mills, which is investing in food start-ups such as Kite Hill and Rhythm Foods.

Innovations such as advanced plant-based protein, fermentation and cell culture are receiving more investment and fuelling product development. Created using wheat and potato protein and heme, the 'Impossible Burger' has received at least \$258 million funding so far and is available in over 500 restaurants across the US.

The report suggested that other companies could do more to develop protein diversification strategies and ensure the long-term sustainability of protein.

Jeremy Collier, founder of the FAIRR Initiative and CIO of Collier Capital, stated: "Today's Plant-Based Profits report shows that alternative proteins are rapidly going mainstream", which will result in an 8% annual growth in the market.

Therefore, it is crucial that the food industry can adapt to these changes. The report revealed that although some companies are well prepared for the rise of alternative proteins, others still have many areas for improvement. It highlighted several weaknesses and suggested the food industry should focus on developing specific strategies that are uniform across the board.

"For food companies and their investors, no roadmap exists to help us navigate the complexity associated with protein diversification. A key first step will be to evolve a shared understanding of what corporate best practice in this area looks like across four strands: strategy, innovation, engagement and metrics," Pollard explained.



\$250 million meat processing plant now under construction

Work has now officially commenced on the construction of the 45,000 m³ purpose-built Hilton Meat Processing and Distribution Facility in Brisbane. The facility will join the Asahi Beverages in LOGOS' 25-hectare Heathwood Logistics Estate. Asahi's facility in the estate was completed in November 2017.

The combined investment from LOGOS and Hilton into the Heathwood Logistics Estate facility will be about \$250 million, with Hilton investing significantly in automation and robotics technology to make it one of the most advanced processing facilities in the world.

Hansen Yuncken and TM Insight have been appointed builder and project manager respectively for the development, with works scheduled to be completed in the first quarter of 2019.

Hilton has committed to an initial 15-year lease term on the facility and will invest up to \$115 million for plant and equipment for the warehouse. Hilton anticipates making its first deliveries to Woolworths stores in January 2020.

The Brisbane 2022 New World City Action Plan identified food and agribusiness as a key growth sector for the city, and this project demonstrates the city's ability to attract significant commercial investment and will create 500 new jobs with the potential to generate \$850 million to the city's economy.

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Packing poultry

Pat Aparo, Advanta

Worldwide poultry production sits at a colossal 111,000 thousand tonnes a year and it's predicted to increase by 24% over the next decade. Innovative packaging can fulfil the convenience and shelf-life demands of this industry.

Convenience is a key driver in changing what is on the supermarket shelves. This is reflected by the increase of pre-marinated, ready-to-cook chicken products, which consumers can put straight in the oven without mess or fuss. This reliance on convenient food products is not limited to the Western world, but it is a trend that's rising across North America, Europe and Asia.

Globally, ready meals and convenience foods are continually on the rise, especially in rapidly urbanising economies such as South Asia, with increased adoption of packaged food products into new consumer markets. In 2017, Western Europe saw the packaged food market grow by 1.5%, compared with a rise of 1.15% in the United States.

There's no denying the growing demand for packaged food, but what does this mean for the poultry distributors, wholesalers or meal developers? Put simply, poultry packaging requires a rethink.

Despite a reduction of red meat consumption worldwide, the consumption of chicken is continuing to grow. However, the industry is experiencing a shift in the types of products consumers are demanding. Today's consumers are replacing traditional product with newer concepts — think marinated wings, ready-to-cook thighs and chickens infused with new and exciting herbs and spices.

With that being said, what does a change in consumer taste mean for those responsible for poultry packaging? Businesses need to respond and react to these changing demands.

Regardless of the quality or desirability of a product, packaging can have a significant impact on whether the customer will make the purchase. This is particularly relevant for poultry. Generally speaking, today's consumers don't want to touch the chicken before it is cooked. Again, it's about convenience.

By having pre-marinated poultry products in an oven-proof tray, the consumer experiences the least fuss as they move their meal from fridge, to oven, to table. The rhythms of working daily life mean that many people aren't interested in the preparation of meals anymore.

Versatility

For consumers, trays that allows meals to be cooked directly in their packaging means that cooking is a fuss-free affair, but this method also has advantages for retailers. For retailers, robust foil trays allow sleeves and cartons to be lightweight, reducing total pack costs and transport costs. Additionally, trays suitable for use with hermetic seal machines and gas flushing techniques allow for shelf-life extension of poultry products if required.


The gas flushing technique, also known as modified atmosphere packaging (MAP), is a carefully controlled blend of different gases used in airtight packaging to increase the shelf life of food. Typically, this is used with plastic trays or smooth-wall foil trays.

For the consumers, they see versatility from a different angle. Products that can be frozen, cooked on a direct flame and put on the table, all in the same container, are ideal.

The future of poultry packaging will marry consumer convenience and shelf-life extension for retailers. While they are not available on supermarket shelves at present, we are set to see the introduction of skin-packed poultry in chicken-shaped foil trays.

The consumer simply peels of the plastic skin surrounding the poultry, revealing the whole chicken in a foil tray, and placing it in the oven. This combination brings the extended life from the skin-pack plastic, and the convenience of the foil tray, ready to be put in the oven and onto the table.

Consumer demand for convenience and retailers' requirements for longer shelf life are refocusing the priorities in poultry food packaging. As consumption of poultry products continues to grow, packaging manufacturers must ensure their packaging is fit for purpose in this sector.

Whether you're in Asia, North America or Europe, consumer preferences will continue to drive changes in packaging, across all poultry divisions. Packaging may take on new forms over the next decade, as long as consumer demands are embraced. 

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The RVA (Rapid Visco Analyser 4800) measures the viscosity and performance of starches, raw materials, ingredients and foods using controlled temperature and shear. It can be used to characterise ingredients, intermediates and finished products to optimise quality and performance.

With an extended temperature range (up to 140°C), the RVA 4800 provides a tool for performing more relevant analyses for a variety of applications, including ingredient (starch and hydrocolloid) performance under conditions relevant to ultra-high-temperature (UHT) pasteurisation of dairy and food products, retorting, pressure cooking, extrusion and other aseptic processing conditions. Temperature and stirring speed (shear) can be programmed to follow international standard methods or use the RVA as a miniature pilot plant to mimic real-world manufacturing and preparation processes such as heating, cooling and mixing.

The RVA 4800 interfaces with a PC and TCW3 software for operation and data management and includes a library of methods for many applications. The RVA 4800 combines speed, precision, flexibility and automation and is a unique tool for research, product development, process monitoring, QC and QA to optimise ingredient use, product formulation and processing conditions.

Perten Instruments Australia Pty Ltd
www.perten.com

Multi-aperture food metal detector

Fortress Technology has released the Phantom, a multi-aperture, multi-lane metal detector range that will assist food manufacturers to reduce factory footprint, investment and ongoing operating costs.

Featuring a single metal detector mounted across multiple food packing and processing conveyor lines, the Fortress unit is divided into individual apertures.

Since each aperture is smaller, the machine has the ability to detect metal fragments as small as 0.8 mm ferrous, 0.8 mm non-ferrous and 1.2 mm stainless steel, regardless of the number of lanes travelling through the unit. In addition, the smaller aperture copes better with orientation and product effect.

Consolidating this multi-aperture technology into one unit spanning multiple lanes, as opposed to individual metal detectors, also cuts the equipment footprint by over 50% and optimises factory floor space.

The unit also increases operational efficiencies, reducing initial capital investment costs for food processors and packers by up to 40% when compared to the purchase of individual metal detectors for each line.

With just one system to maintain and manage, a five-lane multi-aperture unit can improve total cost of ownership (TCO) by over 65% longer term, considering reduced maintenance and parts requirements.

Meat burgers, chilled salads and cakes are among the applications suited to Fortress's multi-aperture, multi-lane technology.

AccuPak

www.accupak.com.au



Harnessing pipeline power

Eliminating turbulence can save as much as 95% of the energy required to pump fluid through a pipe.



Current estimates say that about 10% of global energy consumption is used to move fluid through pipelines. While the food industry does not move volumes on the same scale as the oil, water and gas industries, a lot of fluid is pumped in the food and beverage industry.

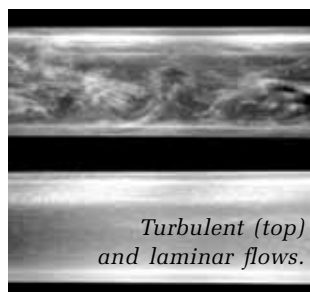
If fluid moving in the pipe is turbulent there is a significant increase in frictional drag, which means more energy is required to move the fluid.

Traditionally, turbulence in pipes was assumed to be stable, and efforts to save energy costs focused on reducing the magnitude of the turbulence rather than extinguishing the turbulence completely.

Researchers at the Institute of Science and Technology Austria (IST Austria), including Professor Björn Hof, Jakob Kühnen and Baofang Song, have established that turbulent flow can be transformed to a laminar flow and remain laminar unless it is disturbed again. Laminar flow, where a fluid flows in parallel layers which do not mix, is much more energy efficient as there is much less frictional drag.

"Nobody knew that it was possible to get rid of turbulence in practice. We have now proven that it can be done. This opens up new possibilities to develop applications for pipelines," explained Jakob Kühnen.

The secret lies in the velocity profile — in the variation of the flow velocity when looking at different positions in the pipe's cross-section. The flow is fastest in the middle of the pipe while it is much slower near the walls. By placing rotors in the flow that reduced the difference between the




Turbulent (top) and laminar flows.

fluid in the centre and that close to the wall, the researchers managed to obtain a 'flatter' profile. For such flow profiles the processes that sustain and create turbulent eddies fail and the fluid gradually returns to smooth laminar motion and it remains laminar until it reaches the end of the pipe. Another way to obtain the flat velocity profile was to inject liquid from the wall. Yet another

implementation of the idea of a flat velocity profile was a moving part of the pipe: by moving the walls quickly over a stretch of the pipe, they also obtained the same flat profile that restored the laminar flow.

The group has already registered two patents for their discovery. However, turning this proof-of-concept experiment into a system that can be used in actual pipelines will require some more efforts in development. So far, the concept was proven for relatively small velocities, but for use in pipelines, an application working at larger velocity will be necessary. In computer simulations, however, the flat velocity profile always led to a successful elimination of turbulence, which is very promising for future developments.

"In computer simulations, we have tested the impact of the flat velocity profile for Reynolds numbers up to 100,000, and it has worked absolutely everywhere. The next step is now to make it work also for high speeds in the experiments," said Björn Hof. 

The group's work has been published in Nature Physics.

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Food Zone Primary (FZP) classification means a product is food contact safe

While there can be vast differences between the regulations, expectations and auditing of food manufacturers and producers across the country, one thing remains constant — risk management is a key to success.

One way that companies can help to reduce their risk is to seek out third-party food safety certifications. The requirements for certified food safety management systems are based on the principles of HACCP. HACCP International operates an assessment and certification scheme for equipment, materials and services used within the food industry that make a contribution to food safety.

But there is even more to the story, with HACCP International working to make certification more transparent and to help food businesses identify appropriate use of products with Food Zone classifications. Karen Constable, Technical Manager of HACCP International explained, “Evaluation of products and services is strictly confined to characteristics which could have an impact on food safety or on the proper operation of a HACCP based food safety programme.”

Certified products are classified as suitable for use in various applications or areas of a food facility. FZP (Food Zone Primary) items are suitable for use in the food zone and are suitable for contact with food. FZS (Food Zone Secondary) items are suitable for touching food contact surfaces but are not expected to touch food during normal conditions of use.

For example, wipers and cloths that are marketed with claims that they are suitable

for direct contact with food must be verified as being suitable for such to be eligible for certification. If they are found to be suitable for certification they will be classified FZP. Wipers that are marketed for use as aids to cleaning and for use on food contact surfaces are certified with the food zone classification FZS if they are found to be suitable for such.

There are also SSZ (Splash or Spill Zone) items that are suitable for use in food zones, but are not suitable for coming directly into contact with food or items that will touch food. And NFZ (Non Food Zone) items make a contribution to food safety, but are not suitable for use in areas where open (unpackaged) food is handled.

Global leading brands like Tork Professional Hygiene recognise the importance of HACCP certification and have a large number of wipers, hand towels, soaps and dispensers that have passed the strict certification criteria. When a business buys a Tork product with HACCP certification they can be confident and assured that it has been assessed as safe for use in the food industry.

There are very few brands of wipers and woven cloths that are classified FZP and HACCP certified. However, a number of Tork wipers and cloths have been HACCP certified FZP, including Tork Basic Papers, Wiping

Papers and popular Tork Heavy Duty Cleaning Cloths, often used as a tea towel replacement in the hospitality industry.

“Verification of suitability for direct food contact can be done in a number of ways. Commonly, HACCP International will review and verify laboratory reports of testing for compliance to EU10/2011 and the requirements of EC1935/2004. The tests are used to check that the wiper (for example) does not let dangerous chemicals leach or migrate into food during contact,” said Constable.

So while many wipers and cloths may be used in kitchens wiping down meat and fish, straining oils and sauces, their job in food manufacturing is less likely to be in contact with food. But knowing that the risks have been assessed should that occur, is reassuring to the quality control manager who may be facing weekly audits and assessments. If it’s in the food zone, being food contact safe simply reduces the risk.

For a free sample pack click [here](#).



www.tork.com.au/FZP

Free chlorine analyser

The ECD FC80 is a panel-mounted, ready-to-use free chlorine analyser. It is designed to monitor free chlorine in drinking water, rinse water, cooling water or other fresh water samples from 0.05–20 ppm chlorine as the standard range or 0.01–5.00 ppm with the low-range sensor. It is compliant with EPA method 334.0 for measuring drinking water.

The chlorine analyser features a plug-and-play design that incorporates a constant head flow control device, a pH sensor, a chlorine sensor and the T80 analyser/transmitter conveniently mounted on a PVC panel.

Users connect the sample and drain lines, connect the power and outputs, and it is ready to use. Calibration is accomplished by DPD comparison.

The T80 is 110-240 VAC or 24 VDC powered and allows either parameter to be graphically displayed with user-defined line, bar or gauge style graphs. The standard configuration has (2) 4–20 mA outputs, (3) alarm relays and MODBUS RTU.

AMS Instrumentation & Calibration Pty Ltd

www.ams-ic.com.au



Hygienic conveyor belt

The Soliflex PRO mini conveyor belt by Ammeraal Beltech is versatile and offers optimal hygiene.

Designed to accommodate smaller-sized products, the belt is suitable for food-related conveying processes — from meat and poultry, to fish and seafood processing, to bakery, confectionery and dairy products.

It has no hinges, inner layers or cracks, eliminating potential bacteria traps. It is easy to clean (reducing water waste as a result), features an abrasion-resistant top surface, delivers maintenance-free self-tracking and comes with customisable lug positioning and accessories.

The product complies with EC1935/2004, EU10.2011 and FDA food standards.

Rydell Beltech Pty Ltd

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PROCESSING



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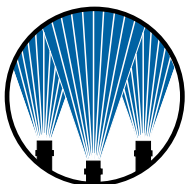
All processors have common goals – to ensure the highest level of food safety possible, optimise production and reduce costs.

Whether you're bagging whole products, packaging linked or formed items, fresh meats, packaged poultry or sliced products, the AutoJet® Antimicrobial Spray System helps processors achieve this outcome.

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What's a food processor to do?



If you have anything to do with the development or processing of food and beverage products, you've noticed a lot of news about technologies available to enhance and improve food safety and shelf life.

Your consumers want fresh, healthy and preservative-free foods that are convenient but delicious. Retailers and foodservice wholesalers want to respond to these consumer demands, but need extended shelf life to reduce product spoilage. Creating products that meet these requirements — not to mention regulatory compliance — is truly a balancing act.

There is a solution: high pressure processing (HPP)

With a 25+ year track record, HPP offers food marketers and innovators the opportunity to ensure food safety and extend market reach with existing products, while enabling refrigerated, preservative-free products that traditionally were shelf stable through the application of heat or preservatives.

The use of HPP, a non-thermal post-package process, continues to rapidly increase in these categories:

- Pre-cooked and ready-to-eat sliced and whole meats
- Ready meals (MREs)
- Juices and beverages
- Dips and spreads
- Guacamole, hummus and salsa
- Dressings and soups
- Deli salads
- Seafood
- Pet food
- Baby food

High pressure processing or pasteurisation is cold pasteurisation in pure water; it uses ultra-high pressure purified water to keep packaged food and beverages pathogen-free to stay fresh longer.

At very high pressures bacteria such as *Listeria*, *E. coli* and *Salmonella* are inactivated while the all-natural technique preserves the vitamins, taste and texture of the food. HPP also extends the shelf life of foods, which reduces waste.

What exactly is HPP and how does it work?

HPP machines surround packaged food and beverages with up to 600 MPa of cold water pressure. This amount of pressure is equivalent to stacking 15 elephants, each weighing five tons, on top of a plastic bottle.

Under this kind of pressure, bacteria like *Listeria*, *E. coli* and *Salmonella* are crushed and cannot survive. Food safety is achieved without the use of chemical preservatives or high temperatures and with little or no changes in nutrition and taste.

Prior to pressurisation, the packaged food is loaded into a basket, then loaded into a closed chamber, sealed and finally pressurised by pumping water into it. The duration of the pressurisation phase is generally one to three minutes.

The high hydrostatic pressure does not affect any of the structural components of the food itself (proteins, fibres, fats etc), nor does it affect the structural integrity of the package used, as the pressure is applied uniformly on the food and the package from all sides. The result is a safe, delicious, clean label food or beverage product with up to four times the shelf life.

Where HPP started

Scientists have known that foods subjected to high hydrostatic pressure last longer before spoiling since 1990 and this effect has been extensively studied since. High pressure processing is now a well-recognised method for microbial inactivation

that opens the door to previously unachievable quality, food safety and new market segments. It also achieves food safety and extends shelf life while providing consumers with nutritious, natural, flavourful food.

Suitable foods

HPP can be used on most air-free, moisture-containing products ranging from salsa, guacamole, hummus, juices, meats, dips, salad dressings, sauces, baby food, pet food, coconut water, cheese, smoothies, fruits, soups and wet salads.

Foods such as marshmallows, bread and whole fruits are not suitable, but pasta and cut fruits in sauce will work with HPP.

Consumer acceptance

HPP is recognised as a food safety intervention technology by the FDA, USDA, Health Canada and other international agencies, and consumers are willing to pay more for all natural, clean label foods.

HPP food and beverages are found in the refrigerated section of grocery, convenience and club stores, otherwise known as the healthy outer perimeter zone.

HPP'd juices and smoothies may be marketed as 'Cold Pressed'.

Deli meats and other foods will have 'All-Natural' or 'No Preservatives' on their labels.

High pressure processed foods will have a clean label without preservatives and added chemicals.

Where can HPP take your products?

Examples of how leading food manufacturers strategically leverage the benefits of HPP today to expand markets, create new products and extend the shelf life:

- A leading pre-sliced meat and salad processor in Greece increased food safety and extended shelf life for its line of packaged meats and now ships product to the Greek Islands where the cold chain may not be reliable.
- With all natural juice products, maintaining taste, freshness and nutrition, without preservatives, can only be achieved with HPP. Because of extended shelf life, a Dutch company is now able to export their fresh juice products internationally.
- A producer of packaged pre-sliced deli meats with major market share for both retail and food service in the USA uses HPP to extend its clean label lines of packaged sliced meats for consumers hungry for convenience. The company's food service lines leverage HPP to meet the strict safety compliance requirements for institutional and hospital use.
- Traditionally preserved baccala (dried salted codfish) is well loved but inconvenient for consumer preparation. Using HPP after hydration and packaging, a gourmet convenience seafood product was created for consumers with the shelf-life extension demanded by retailers. Sales of the product have increased not only in season but year-round. >

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“Manufacturers and producers need the confidence that their product will retain its texture, flavour and appearance with high pressure.”



- Using HPP, a southern California seafood processor recently launched a new line of refrigerated fresh fish immersed in sauce with a 30-day shelf life. Consumers get a delicious, nutritious, tastes like ‘home-cooked’ meal.

From concept to reality

Implementing HPP is more than just installing equipment. Manufacturers and producers need the confidence that their product will retain its texture, flavour and appearance with high pressure. Before HPP becomes incorporated into a product processing strategy, objectives for that product must be defined.

- Is pathogen elimination a key objective?
- Is shelf-life extension needed in order to enable innovation or to reach new geographic or demographic markets?
- How important is clean-label?
- Are consumer requirements of convenience and quality attainable?
- Is the product even viable for high pressure processing?

It's after you've determined that HPP will achieve your objectives and is suitable for your product that the ‘process’



of high pressure processing begins. “HPP is the packaging.” “It's the equipment.” “It's the food science and product development.” “It's all about the marketing.”

Successful high pressure processing involves packaging, equipment, food science, product development and marketing. A coordinated cross-functional effort in the processor organisation and a vendor who can support the processor from its conception through its life cycle are required.

Embarking on delivery of a new HPP product is a journey, which will require resources from your:

- R&D: Product and packaging development and validation.
- Operations: Equipment and automation/material handling selection, installation planning and support, and ongoing operation of your HPP site.
- Safety/Quality Control: HACCP planning and approvals, adherence to processor's quality standards.
- Marketing: Product testing, branding and go to market/launch efforts.
- Maintenance: Team training, efficient system maintenance, initial spare parts quantities planning.

Complete HPP solutions

JBT Avure Technologies has been involved in the creation and delivery of 70% of commercially available HPP products to date. The company's expertise can assist processors to take new products from conception to market launch and beyond.

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Widescreen IP65 panel PC

The Advantech SPC-1881WP is an 18.5" widescreen, multitouch stationary panel PC with an Intel Core i3-4010U 1.70 GHz processor, specifically designed to provide easier operation and to boost productivity in areas that require frequent jet washing.

A slender, elegant aluminium housing not only emphasises modernity but also offers all-around IP65 protection, displaying high mechanical stability and reliability. M12 connectors and the integrated VESA connector allow the device to withstand high water pressure from cleaning and offer a high level of waterproofing in humid environments.

In areas such as food and beverage, and chemical manufacturing where frequent cleaning is a necessity, the SPC is suitable as the device and its connectors are protected against dust and water. This enables them to survive the rigours of jet washing and scrubbing while they are hung on either pedestals or pendants.

It features a wide screen with a ratio of 16:9, providing 40% more screen area than 4:3 displays. With the addition of multitouch capabilities, it provides even greater control and viewing of SCADA information.

All of this is made possible with the inclusion of an Intel Core i3-4010U 1.70 GHz processor with independent graphical processing unit, which provides support for Windows 10 and DirectX11 so it can handle more complex and detailed graphics.

Advantech Australia Pty Ltd

www.advantech.net.au

Endless fibre technology cleaning cloths

Tork Cleaning Cloths are produced using endless fibre technology called exelCLEAN, which increases the strength of the cloth. The uniform construction improves high-performance durability and cleaning performance.

Some of the range carries HACCP Food Zone Primary (FZP) classification indicating they are safe for use in direct contact with food, so they are suitable for open-loop food processing.

The folded cloth packs have been compressed to reduce storage space by up to 26%, adding to efficiencies. Two packs can be loaded at once into Tork W4 dispensers, reducing maintenance and refilling.

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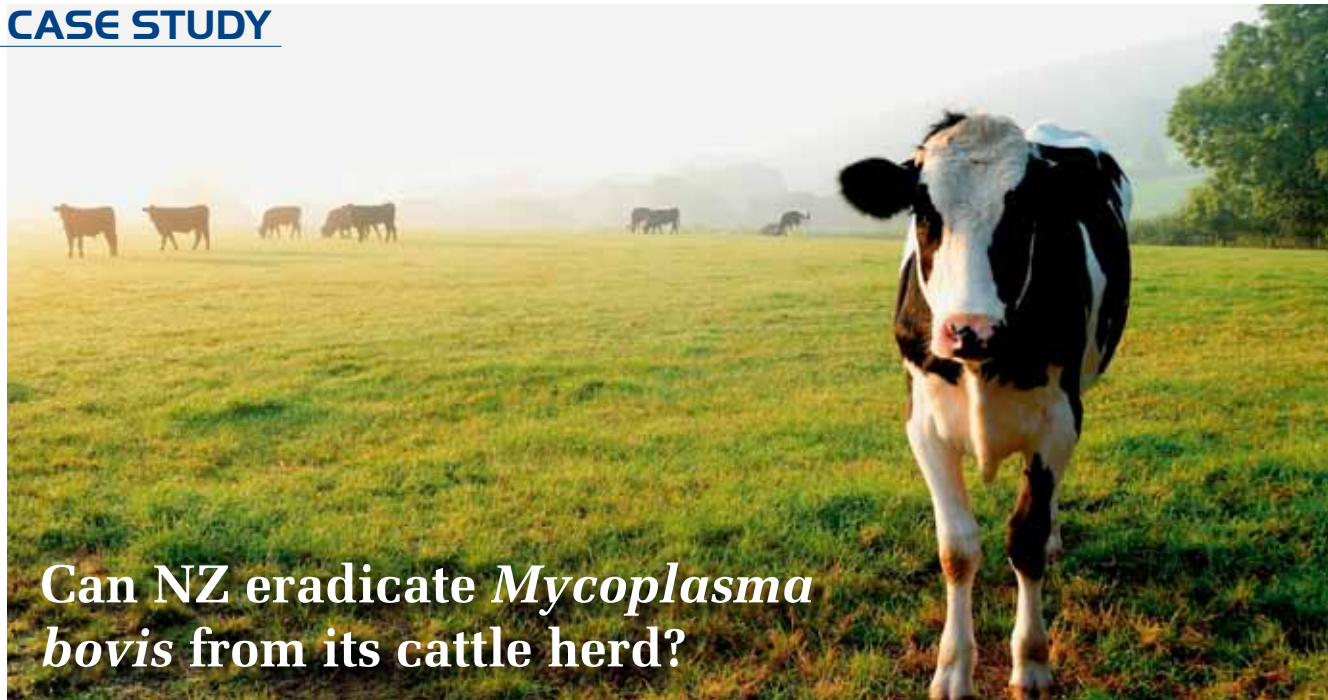
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Can NZ eradicate *Mycoplasma bovis* from its cattle herd?

New Zealand and Norway were once the only countries in the world that were free from *Mycoplasma bovis*. However, during 2017 the bacterium was found in New Zealand on farms in South Canterbury, Hawkes Bay and Southland.

While the meat and milk from affected cows is quite safe to consume, *Mycoplasma bovis* causes a range of diseases, including mastitis in dairy cows, arthritis in cows and calves, pneumonia in calves and various other diseases likely including late-term abortion.

The Ministry for Primary Industries (MPI) has determined that all cattle on properties infected with the cattle disease *Mycoplasma bovis* will be culled. Currently, 28 infected properties have been identified but only 22 of them have cattle remaining on them.

"The depopulation of entire herds on all 28 Infected Properties (IPs) in New Zealand is a critical measure to control the spread of the disease and we will be working closely with those farmers to plan how this will happen," said MPI's response director Geoff Gwyn.

"This will be a big job and won't happen overnight, but we'll be meeting with the affected farmers in the coming days to discuss the operation, develop the plans and talk through compensation."

All IP farmers will be compensated for their verifiable losses. MPI continues to build its compensation team to make sure farmers are compensated as quickly as possible. Once farms are de-populated and cleaned, these farmers can start rebuilding a disease-free herd from scratch.

"We understand this has been an incredibly difficult time for farmers while they wait for critical decisions to be made about managing and controlling this disease," said Gwyn.

"This cull will give those farmers back some certainty and control over the future of their farms, their animals and their livelihoods.

"We are able to take this decision now because we are confident *Mycoplasma bovis* is not well established in New Zealand.

"The testing of milk from every dairy farm in New Zealand is very well advanced and to date has only identified one new infected property.

"This, combined with MPI's extensive surveillance work tracing every possible movement of animals from infected farms, gives us the confidence to say the disease is not widespread, but is limited to a network of farms connected by animal movements. Culling these animals is now the appropriate action."

Non-infected farms that are under Restricted Places Notices (RPN) or Notices of Direction (NoDs) are not being asked to cull their herds at this point because infection has not yet been confirmed on those properties. Confirmation relies on the defining genetic test which provides complete confidence that animals on a farm are positive.

Gwyn said MPI will work with farmers to develop individual management plans for each of these properties — until a decision on whether to eradicate *Mycoplasma bovis* or move to long-term management is made.

"We all want to eradicate *Mycoplasma bovis* — but it has to be technically possible, practically achievable and affordable for everyone. Our focus is on the resilience of our dairy and beef industries which are such significant contributors to our economy, and on farmer wellbeing and the welfare of animals.

"Whatever option is taken, we will need to see some big changes in on-farm biosecurity and NAIT compliance. There remains a big job to do around this disease, and there is no quick exit from this situation."

While MPI with industry partners will continue to focus on surveillance and tracking the spread of the disease, there is critical work being done to model the potential spread of *Mycoplasma bovis* under different scenarios and in understanding the costs and benefits of decisions around eradication.

"People will say 'why haven't you done this already'. In fact, we have been working on this since the disease was detected and we depopulated seven farms in December. We halted further culling until we better understood the spread of the disease. We are now at that point where we have that understanding and can complete this work with confidence," said Gwyn.

"We now believe the disease is not endemic and we can complete this analysis and planning, but we will take care and time to get it right because decisions about the future management of this disease are too important to rush."



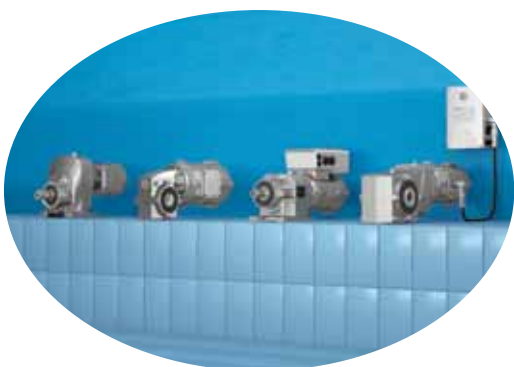
Bio-based spouts and caps

Gualapack has developed a range of spouts and caps made exclusively of bio-sourced polymers (from raw materials derived from renewable sources, according to ASTM D6400 standard). Bioplastic raw materials are based on plants rich in carbohydrate such as grains or sugar beets/cane.

The spouts and caps are suitable for cold filling, ambient filling, hot filling and pasteurisation processes.

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www.auspouch.com.au



Corrosion-resistant aluminium drives

NORD's nsd tupH aluminium drives have a smooth, ultrahard surface which, in contrast to paint, is unaffected by blows or scratches. The drives have been tested for wet applications.

They are resilient against blistering and corrosion as per ASTM and ISO standards. Under testing the unit showed no loss of adhesion or chipping, while the salt spray test produced no corrosion even after 2000 h.

In demanding atmospheres, the drives can be used beyond the usual service life of paint-coated systems. Their resilience and prolonged service life reduces the service and maintenance requirements placed on users, according to the company. The treatment ensures high process safety: since no coating is applied but the surface itself is hardened, there can be no pollution of products or process media as, for instance, with chipping paint. Heavy impacts or scratches do not diminish the corrosion resistance.

The drives are approved for food applications according to FDA Title 21 CFR175.300.

NORD DRIVESYSTEMS (Aust) Pty Ltd

www.nord.com

Spray gun for food

Spraying Systems Co's GunJet

D41663 is designed to be a durable and efficient spray gun suitable for spraying oils, sugar glazes, chocolate coatings, egg wash and more.

With a max operating pressure of 75 psi (5 bar), as well as an ergonomically designed soft grip to improve control and reduce operator fatigue, this spray gun is suitable for food applications needing a delicate mist all the way up to applications that need a steady stream.

The removable adapter and grip makes it simple to hygienically clean all external and internal parts of the gun when needed. Hose connectors can be turned into any position for maximum flexibility while a trigger lock will prevent accidental discharge and dripping. The nylon handle remains cold and comfortable even during hot applications (max 70°C). The smooth-pull trigger helps enable accurate and consistent flow control by the operator.

The use of the GunJet D41663 will see a reduction in water consumption, in floor cleaning time and overspray, as well as increase in the result of the overall product, according to the company.

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Getting the jam into lots of doughnuts

Large bakeries need to automate the quick and hygienic emptying of pastry fillings from mobile mixing tanks into bakery products.

Pastries and doughnuts can be filled with a diverse range of products, from liquid chocolate sauce, to stiff vanilla cream, to jams containing fruit pieces up to 15 mm in size. In large bakeries these fillings are often prepared in mobile mixing tanks and fed to the production lines where, depending on the filling and the type of pastry, the feed speed can be up to 50 L/ min. The different fillings have different viscosities, but all have to be fed from the boiler to the pastry filling plant in a hygienic and efficient manner.

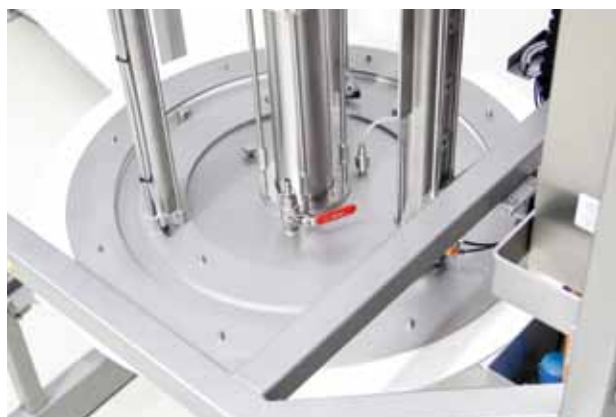
A German bakery is using the ViscoTec ViscoMT-XL barrel emptying system to move fillings for Danish pastries, puff pastries and Berlin doughnuts from 500 L preparation tanks to the filling line.

One challenge facing process-reliable feeding is to supply the different fillings to the line very quickly and at the same time ensure the output quantity of pastries.

The ViscoTec barrel emptying system fulfils this criterion and supplies the line with sufficient filling material. The automated filling, directly from the tank into the hopper of the production line, facilitates the production process and the output of finished pastries is much higher. As a result, there is no downtime in the production line and the entire supply runs reliably. In addition, the user has the advantage

that filling errors and wastage are avoided.

By implementing different sensors (eg, level sensors in the tank or pressure sensors), the need to change the tank can be detected early and no production time is lost. Since the fillings are not exposed to their surroundings, there is no risk of contamination. At the end of a preparation phase in the tank, the fillings are immediately covered by the follower plate of the barrel emptying system and are ready to be filled into the pastry in a closed system.



From left: Barrel emptying system for a tank. Emptying pump with follower plate. Control system for the emptying system.

How the system works

The progressive cavity pump forms the base of the barrel emptying system. It belongs to the group of rotary displacement pumps and is based on a volumetric pump technology. The operation is similar to an endless piston, which feeds the product from the suction side to the pressure side and thereby builds up a difference in pressure. The interaction of an eccentrically moving rotor and stator results in a feed and dosing characteristic that corresponds to that of an endlessly moving piston.

Due to the dosing geometry, a constant volume is always fed proportionally to the rotation angle per revolution. The feed direction is reversible by reversing the direction of rotation. The volume is therefore clearly defined via the degrees of angle. This technique results in a pressure-stable, linear pump characteristic, which makes a clear statement about the ratio of revolution, time and flow rate. In turn, this leads to a dosing accuracy at the pump outlet of 1% (depending on the material), which in practice often falls below this percentage.

Another benefit of this technology lies in the resulting feed chamber, whose volume remains constant over the course of the movement. This makes it possible to feed and fill solids-laden fluids and even chunky products. Even difficult, highly viscous liquids can be dosed reliably without pulsation, avoiding dosing errors or excessive stress on the material.

The barrel emptying in practice

The high suction capacity resulting from this technology is used in barrel emptying. In general, such a system consists of three essential components: frame with lifting unit, emptying pump with follower plate and control.

The pump — in this case, the hygienic pump 2RD50 — is arranged vertically, while the follower plate with wiper ring sits on the suction nozzle. All wetted parts are FDA compliant and food grade certified. ViscoTec pumps from the RD series (hygienic version) have good cleaning properties, are fully CIP and SIP capable, meet high hygiene standards and are EHEDG (European Hygienic Engineering and Design Group) certified.

During the process in which the various fillings are fed to the line, the pump continuously removes the pastes from the tank and feeds them via a hose line to the filling line. This creates a negative pressure in the container, which the follower plate 'follows'. The inner wall of the container is wiped clean by the special sealing lip on the follower plate. By using this emptying principle of wiping the container, it is almost completely emptied. The remaining residual quantity is less than 1% and saves in both the cleaning effort and the pastes and fillings themselves, which would otherwise be discarded or manually emptied and fed into the line.

The emptying speed can be easily changed via the electric motor, by simply raising or lowering the motor speed. If, for example, the cycle time of the filling line needs to be increased, only the drive speed of the motor need be increased.

In addition, the system can be easily integrated into existing lines and manufacturing concepts. Even with lines where the masses and materials were previously fed manually, the system can be connected very easily: the tank emptying is operated completely autonomously, without interface to the existing filling line.

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What's in the mix?

Improving risk assessment of food contact materials

Nate Seltenrich*

Sometimes there's more to food than just, well, the food itself — materials that come into contact with food as it is being processed, packaged and transported have the potential to leach chemicals into the product.

Packaging, storage tanks, machinery, transportation containers — these and other critical components of food production have the potential to leach chemicals into foods and beverages.

The steps involved in bringing food to grocery store shelves present a ubiquitous yet poorly understood route of exposure to chemicals of which most people are unaware. Researchers have limited knowledge of the breadth and relative safety of all materials that may come into contact with food during processing. This lack of information impairs their ability to assess risk and to inform public policy, according to the authors of a commentary in *Environmental Health Perspectives*.

In addition to their constituent chemicals, food contact materials may also contain complex mixtures of non-intentionally added substances (NIAS), such as reaction by-products and impurities.

In one 2007 study, chemical analysis of plastic samples from food contact materials turned up unidentified compounds that could not have been predicted from the known composition of the samples. According to the commentary authors, led by Martin Scheringer of the Research Centre for Toxic Compounds in the Environment at Masaryk University, Czech Republic, and Jane Muncke, manager of the non-profit Food Packaging Forum, these findings indicate that “comprehensive qualitative and quantitative chemical analyses of plastic [articles that come into contact with food] are currently impossible”.

There is evidence that plastic products such as food wraps, bags, clamshell containers, and baby and water bottles leach

chemicals with endocrine-active properties that potentially pose health risks even at very low levels. However, this consideration has not made its way into risk assessment as far as food contact materials are concerned.

To improve risk assessment, the authors recommend evaluating potential low-dose effects (common with endocrine disruptors) for all of what they dub food contact chemicals, or any chemical that is either used in the manufacture of food contact materials or otherwise present in finished food contact materials. Notably, they also recommend performing toxicological assessments of these finished materials — in other words, the complete mixture of substances used to produce the material as well as any NIAS that may be present.

The latter recommendation would be a significant change to current practices in the United States and Europe for two reasons, Muncke said. First, it takes into account the idea that mixtures, not just single substances, can migrate into food. Second, it shifts the chemical risk assessment from the beginning of the manufacturing process to the final stage — “better reflecting the reality of what comes into contact with food and what people are exposed to”, she said.

Mark Maier, formerly a staff toxicologist for Valspar Corporation, led that company's efforts to identify a non-estrogenic replacement for bisphenol A (BPA) in its coatings for food and beverage cans. A January 2017 study co-authored by Maier, who continues to consult for Valspar and was not affiliated with the new commentary, found no evidence of estrogenic

activity by the company's replacement epoxy monomer, tetramethyl bisphenol F (TMBPF).

"The way I look at it, Valspar is trying so hard to do the right thing," he said. "They're trying to get the data that's called for in this paper. As far as their willingness to make data transparent and make data available, I think Valspar stands alone in that regard. But gosh, I hope that can change."


However, Maier disputes the authors' recommendation that researchers and regulators ensure adequate toxicological assessment of all food contact chemicals. "I would frame the recommendation differently," Maier said. "If you [attempt to] test everything for every possible problem, you have to evaluate every packaging chemical and mixture to the nth degree. That makes no sense for chemicals with such low exposures." Instead, he said, researchers should focus on plausible effects for relevant classes of chemicals at relevant exposure levels. He also believes there is no reason to keep retesting materials such as polyesters and acrylics "just to show what we already know". He explained, "You can't test everything; you have to test for things that make sense. You will never get all of them."

That said, the US Food and Drug Administration's "generally recognized as safe" (GRAS) designation is a loophole that has allowed many unknown and potentially unsafe chemicals into foods over the last 60 years, according to a 2014 report from

“ “ The US Food and Drug Administration's "generally recognized as safe" (GRAS) designation is a loophole that has allowed many unknown and potentially unsafe chemicals into foods over the last 60 years ” ”

the non-profit Natural Resources Defense Council (NRDC). A general lack of transparency pervades the regulatory environment for food contact materials, said commentary co-author Maricel Maffini, an independent consultant on issues related to environmental health, chemical safety and science policy.

"In many cases, some of those chemicals were approved decades ago with likely almost no toxicity data," said Maffini, who also coauthored the NRDC and TBMPF studies. Even today, she said, "if a company claims that exposure will be below a certain level, the company may not be required to provide any toxicity info. The amount of data that's available is very limited."

To see the original article and further references, visit <https://ehp.niehs.nih.gov/ehp2602/>. 

**Nate Seltenrich covers science and the environment from Petaluma, California. His work has appeared in High Country News, Sierra, Yale Environment 360, Earth Island Journal, and other regional and national publications.*



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Pneumatic pinch valves

Pneumatic pinch valves from Festo are designed to provide reliable control and shut-off in food and drink production processes. The valves are durable, energy efficient, easy to service and flexible, thanks to their simple construction, and as a result provide a cost-effective alternative to conventional valves such as diaphragm and ball valves.

The VZQA pinch valves are a clean and technically straightforward solution for use with a wide range of media such as liquid, fibrous, particulates or granular substances.

They provide smooth media flow and as such they are suitable for optimising filling and metering systems. Their compact design saves valuable installation space, which enables engineers to enhance the design of their process.

The high-performance valves are easy to service, which enables food processing managers to save downtime and associated costs. The pinch valve's sealing cartridge can be changed in just a few minutes in four simple steps without special tools, and they can be cleaned easily thanks to their full media passage flow and little dead space. The sealing cartridge is available in EPDM, NBR and Silicone to suit a wide range of demanding applications and media.

Made from aluminium or stainless steel, the pinch valves are suitable for challenging environments and the internal parts offer durability against aggressive media. Thanks to a patented sealing cartridge, the valves can withstand the high demands in continuous daily operation, whether abrasive, corrosive, highly viscous or neutral media is used.

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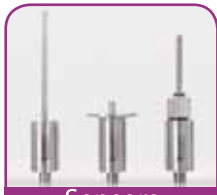
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In-ground gravity grease separators

ACO's range of in-ground gravity grease separators is available with a total capacity of up to 5000 L. Wastewater containing fats, oils and grease (FOGs) and food solids enters the grease separator from the kitchen or food processing plant, with food solids sinking to the bottom of the unit under gravity. FOGs, which are less dense, float to the top and the treated wastewater flows into the sewer system.

The range of below-ground grease traps is now available in 3000, 4000 and 5000 L capacities for in-ground applications to complement the 1000, 1500 and 2000 L below- and above-ground units. Larger commercial kitchens such as hospitals, cafeterias, cafes and small food processors can have greater control over FOGs discharged from sinks, dishwashers, kitchen appliances and other drainage outlets.

A single access point in the below-ground units allows for easy access for maintenance and cleaning. The company has a choice of access covers and reinforced precast concrete collars to provide protection of the grease traps for high traffic and load environments.

Constructed from lightweight polyethylene or glass-reinforced plastic (GRP), the grease separators feature a smooth finish for easy cleaning and are corrosion resistant to cope with harsh environments. If buoyancy is a concern, the grease separator design includes external ribs that key into the surrounding soil to assist in preventing the unit from floating.

Lightweight and robust, the grease traps are easy to install and can be incorporated into the overall wastewater system at the design stage or as a retrofit or upgrade. The company provides full installation and design support for the decision-making process including Revit models, drawings and installation guides.

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packaging & labelling

Is that meat still OK?

With technology seeping into every industry, society is expecting everything to become more intuitive or 'smart', including packaging. Rather than continue to guess when food has spoiled, which leads to waste, consumers want to know definitively whether food is suitable for consumption or not.

Best before dates are currently the most commonly used indicator, but they are merely guidelines. New technology in the form of a tiny patch inside packaging may be able to replace these to show consumers if or when food should be disposed of.

McMaster researchers have developed a transparent test patch that can monitor for harmful bacteria such as *E. coli* and *Salmonella* and show contamination in real time.

"In the future, if you go to a store and you want to be sure the meat you're buying is safe at any point before you use it, you'll have a much more reliable way than the expiration date," said lead author Hanie Yousefi, a graduate student and research assistant in McMaster's Faculty of Engineering.

The test patch, called 'Sentinel Wrap', would be printed with harmless molecules which would detect pathogens inside the

package and trigger a signal that could be read by a handheld device.

According to the researchers, mass producing the patch would be fairly inexpensive and simple, with assistant professor of mechanical engineering and member of the McMaster Institute for Infectious Disease Research Tohid Didar stating, "A food manufacturer could easily incorporate this into its production process."

This has huge potential to help address foodborne illnesses, as statistics from the World Health Organization show that foodborne pathogens result in approximately 600 million illnesses and 420,000 deaths every year. The researchers suggested it

may also have important applications in the medical industry, such as on bandages to detect an infection in a wound.

However, further studies are needed to develop the patch to detect other pathogens, and the researchers would need a commercial partner and regulatory approvals before it could go to market.

The findings were published in the journal *ACS Nano*.



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The Australian Pouch Company is working with Gualapack to offer a comprehensive range of sustainable flexible packaging solutions.

Gualapack's CheerNEXT is a bio-based, alu-free pouch that can contain up to 80% of bio-sourced raw materials. It is suitable for cold filling, ambient filling and hot filling processes and can sustain a pasteurisation treatment.

Safta's LamiNEXT is also made of bio-based raw materials derived from renewable sources, according to ASTM D6400 standard. Bio-plastic raw materials are based on plants rich in carbohydrate such as grains or sugar beets/cane. All applications using PE are feasible as LamiNEXT bio-based, PP in development for retort application.

The compostable and biodegradable LamiNEXT breaks down naturally into organic components in 12 weeks under composting conditions without releasing toxic heavy metals, in compliance with EN13432.

Gualapack can produce compostable or bio-based Stand-Up Pouches from Safta's LamiNEXT laminates.

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Milk drink packaging uses augmented reality

Innovations in the packaging industry tend to focus on sustainability or maintaining the freshness of a product, but Yili Weikeyi has developed packaging that uses augmented reality (AR).

Packaged in 240 mL aseptic drink boxes, the company's milk drinks feature the voiceprint of singer Han Lu. When consumers scan the voiceprint with a smartphone app, they will be presented with a different audio message for each of the four flavours — coffee, strawberry, banana and chocolate.

It will also launch an AR app in which consumers can play with and customise floating planets. For example, they can tap on plants to play sounds, record their own voiceprints, create their own planets using the AR and voiceprint technology, and share their creations with their friends.

According to GlobalData's Q1 2017 consumer survey, interactive packaging has been gaining consumer interest, with 23% of global consumers and 40% of Chinese consumers claiming it is exciting. China is therefore a lucrative market for this type of packaging innovation, which bodes well for Yili Weikeyi's new offering.

Tom Vierhile, innovation insights director for GlobalData, suggested this was not the first time the packaging industry has turned to AR to create new experiences for customers.

"Making product packaging 'come alive' with AR has tremendous potential for fast-moving consumer goods. We are just beginning to see FMCG companies explore the possibilities. Just before Halloween in 2017, the Australian wine brand 19 Crimes launched an app that used AR to make each wine label come alive; the prisoner pictured on each label would move their lips and talk when scanned with a smartphone," he said.

In 2017, AUSPACK similarly announced it was using AR technology in which users downloaded an app and scanned the edge of its packaging to display animated artwork and a customised video. While it has been known for a while that AR can deliver new customer experiences and better interactions with products, it is still widely underutilised.

Vierhile said Yili Weikeyi's AR packaging produces benefits for consumers and strengthens its marketing strategies.

"The brand has also strengthened its connection with popular singer Han Lu since his voiceprint is displayed on each package, closing the marketing loop in a brand new way."



Ecolabelling standard revised

When ISO 14024 Environmental labels and declarations – Type I environmental labelling – Principles and procedures was first published in 1999, the world was a very different place. Now claims such as natural, recyclable, eco-friendly, low-energy and recycled content are recognised as conferring market advantage to products and the Standard has been updated to reflect the current environmental context.

ISO 14024:2018 refers to Type I environmental labelling programs, which are voluntary and can be operated by public or private agencies at the national, regional or international level. It establishes the principles and procedures for developing Type I environmental labelling programs, including the selection of product categories, product environmental criteria and product function characteristics, and for assessing and demonstrating compliance. It also establishes the certification procedures for awarding the label.

A Type I label is a third-party assessment of a product based on a number of criteria involved in the environmental impact of a product or material throughout its life cycle.

Hungry? Eat your RFID tag

At Rice University, scientists are looking at ways to embed conductive identification tags and sensors into the products themselves, including food.



They are not using traditional printing with edible inks but rather converting some of the food itself into graphene.

The team has developed a method that uses a commercial laser to transform the top layer of an inexpensive polymer film into graphene foam.

Consisting of microscopic, cross-linked flakes of graphene, the foam is a two-dimensional form of carbon that can be written into target materials in patterns and used as a supercapacitor, an electrocatalyst, radiofrequency identification (RFID) antennas and biological sensors, among other potential applications.

The 'tags' could for example, potentially act as sensors to detect *E. coli* or other microorganisms on food.

Horizontal netting machine

The REV VEGA horizontal netting machine is a versatile, automatic machine that works with a wide range of products, including vegetables, citrus fruit and other fruit. It can be used for both bulk produce up to 2 kg and for punnets, trays and small cartons (up to 20 x 30 cm) with knitted and extruded nets, metal clips and labels.

It is suitable for courgettes, peppers, cucumbers, aubergines, carrots, apples, melons, avocados, citrus fruit, pears, onions, garlic, potatoes, chestnuts and mushrooms. A special conveyor system makes it gentle and it can process up to 35 packets/min.

Emrich Industries Pty Ltd
www.emrich.com.au

VFFS system

tna has launched the tna robag 5, an ultra-high-speed VFFS system. With speeds of up to 300 bags/min on a single tube design, the bagging system is the final element in the tna performance 5.0. The VFFS system comes with a high-performance scale, continuous motion ultrasonic back seal technology and an advanced controls platform. Together with the ropac 5 case packer, the company claims the robag 5 will increase production line efficiencies by doubling the current average packaging speeds within a single, fully integrated and compact system.

It has been equipped with a range of features, including the company's intelli-weigh 0220 omega high-speed scale. Featuring 20 weigh heads, this scale is capable of combining up to eight different products, while offering fast and accurate product transfer with minimum waste. In addition, the integration of ultrasonic back seal technology has enabled the company's engineers to overcome the thermal transfer limitations of traditional heat seal methods to provide seal integrity at high speeds. Together with the intelli-date 5 date coder, the robag 5 can operate at speeds of up to 300 bags/min from a single tube, while reducing the amount of waste, ensuring that each bag meets high quality standards.

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Court rules Heinz misled consumers with health claim

Concerns over the health claims on packaging are not unfounded, as the Federal Court ruled Heinz made a misleading health claim on food aimed at children aged 1–3.

The Australian Competition and Consumer Commission (ACCC) launched legal action against the food giant in June 2016 following the Obesity Policy Coalition raising concerns over the ingredients of food products for toddlers.

Heinz's Little Kids Shredz products were advertised as being nutritious, with images of fresh fruit and vegetables and the statement "99% fruit and veg" featuring on the front of the packaging. "Our range of snacks and meals encourages your toddler to independently discover the delicious taste of nutritious food", the product stated.

However, on closer inspection, the three flavours contained between 62 and 68% sugar. Since they were predominantly made from fruit juice concentrate and pastes, which are very high in sugar, ACCC Acting Chair Delia Rickard explained that they could not be compared to naturally occurring sugars in fruit.

"Heinz's Shredz products consisted of over 60% sugar, significantly higher than that of natural fruit and vegetables. An apple in comparison contains around 10% sugar," said Rickard.

Fruit juice concentrate can lead to obesity and health decay, which is why the World Health Organisation recommends limiting the intake of these foods to below 10% of a person's daily energy.

Allegations that Heinz breached Australian Consumer Law due to its misleading conduct were upheld by the Court, and Justice Richard White agreed that the products were not beneficial to children's health "by reason of their high sugar content and sticky texture".



However, he dismissed two further claims by the consumer watchdog that Heinz implied its Shredz products had the same nutritional value of natural fruit and vegetables, and encouraged the development of healthy eating habits in children.

"The consumers would, in my opinion, have readily understood that the berries

product was a processed product and would have understood that a representation was being made that it was derived, at least principally, from the depicted ingredients," Justice White said in his judgement. "They would not have understood the product to be in the form of fresh fruit and vegetables."

The three varieties of the Shredz product — peach apple and veg, berries apple and veg, and 'strawberry and apple with chia seeds' — have not been available in supermarkets since May 2016.

Heinz Australia Managing Director Bruno Lino explained the company was "disappointed with the outcome but respects the decision that has been made".

Rickard, on the other hand, said he welcomed the Court's decision, as it highlights the consequences of making misleading claims about the health benefits of products.

Autocoding system

The security and traceability of food has become an area of great focus within the food manufacturing industry. The accuracy of the packaging and date code information is of paramount importance, yet it is an area where errors still occur, resulting in scrapping, rework or an expensive recall of food products.

An AutoCoding solution takes the problem away from the packaging line. All the information relating to a product, such as date coding rules, packaging configurations, coding profiles etc are held in a database which is maintained away from the factory environment. Rule changes for events such as avoidance dates, concessions, promotions etc are all preprogrammed into the system so that at the time the product is run on the line, the local operators do not have to make any changes which may result in error. The information stored in the AutoCoding database is used to automatically set up all the printing equipment, while barcode scanners check every product to ensure the correct label or packaging, as well as artwork version, is being used.

For increased data integrity, it can seamlessly integrate with other business systems, such as an ERP, MES or planning system to ensure all relevant product information originates from a single source, rather than multiple points of entry.

Additional value-add modules are available for enhanced functionality, including Inspection Reporting for checkweighers/metal detectors, Paperless Quality for inline quality checks and Line Performance Reporting to assist in improving productivity.

AutoCoding Systems Pty Ltd

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Volumetric filler

JBT's High Capacity Unifiller is designed to fill 1500 containers/min.

The Unifiller can be synchronised with the company's 12-head seamer to provide a high-speed canning solution. It includes the features required for Total Performance Management (TPM), such as clear-guarding, enabling easy revision of the machine as it functions and LED lighting. The system's built-in clean-in-place (CIP) technology also means the system can be cleaned in around one hour, maximising uptime and minimising downtime.

The product is suitable for: high-speed filling of coffee drinks in glass bottles, high-speed canning of evaporated milk and high-speed filling of sweetened condensed milk.

JBT FoodTech

www.jbtfoodtech.com



Metal detector

Eriez's Xtreme Metal Detector is

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In its base package, the metal detector offers a 7" easy-to-use touch-screen interface, multiple pre-programmed languages, easy set-up and reporting, multiple USB and interface ports, remote access and the standard high-pressure washdown design. It also has a hygienic design and rugged construction.

The Xtreme offers a high level of protection against metal contamination and is suitable for the food, textile, pharmaceutical, plastics, rubber, chemical and many other industries.

For more information, visit <https://www.eriez.com.au/AU/EN/eriez/Products/Metal-Detection/Xtreme-Metal-Detectors.htm>.

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Has infant formula been causing *Salmonella* for 13 years?

Nichola Murphy

39 infants in France, Spain and Greece ill after consuming formula processed by Lactalis.

Mothers protect their children from a number of threats, but they never expected that their infant formula could be one of them.

Late last year, French processing company Lactalis — one of the world's largest producers of dairy products — was pinpointed as the vehicle of *Salmonella* Agona (S. Agona) infection, which has affected 39 infants below one year of age since August 2017.

After the Pasteur-based French National Reference Center (CNR) alerted authorities about the unusually high number of infant cases of *Salmonella*, authorities carried out an epidemiological investigation and confirmed the outbreak in December.

37 of the 39 documented cases have been in France, but the international spread of the disease was caused by the circulation of seven brands of infant powdered milk manufactured in Lactalis's factory, including Milumel, Pepti Junior and Picot. A Rapid Outbreak Assessment (ROA) by the European Food Safety Authority (EFSA) and the European Centre for Disease Prevention and Control (ECDC) stated that whole genome sequencing (WGS) has also confirmed one related case in Spain and one in Greece.

The part of the plant responsible for the outbreak has been shut down and the company has recalled 12 million tins of formula from over 80 countries. However, Lactalis Chief Executive Emmanuel Besnier stated that the returned products did not even amount to half of total volumes.

Since 15 January 2018, the recalled products have been distributed to 13 European Union countries (including Bel-

gium, Cyprus, France and Greece) and to 54 third countries. The majority of the products have also not passed their expiry date, meaning it is still available for consumption; the potential for more cases to be reported cannot be ruled out entirely.

A decade-long problem

Taking into account the most recent outbreak, over 200 babies in France have been contaminated with S. Agona since 2005. Using new technology, the Pasteur Institute confirmed that an outbreak in 2005 which sickened 141 was caused by the same strain as the current outbreak.

The origin of the 2005 outbreak was believed to be a factory in Craon, the same one that Lactalis took over in 2006. The bacteria likely remained in the premises over the last 13 years and could have been the cause of numerous other cases of S. Agona contamination. Besnier said recent renovations may have facilitated the 2017 outbreak.

"It can not be excluded that babies have consumed contaminated milk over this period (2005–2017)," Besnier said.

The company's internal tests revealed traces of *Salmonella* at the factory in August and November last year, but it supposedly was not found in any of its products and was therefore not deemed to be a public health threat. Besnier criticised tests performed on final products in 2017 that should have detected if the bacteria was present.

"If the analysis of end products had revealed the presence of *Salmonella* Agona, we would of course not have marketed the products and we would have avoided the crisis."

Besnier continued by stating the outbreak would cause significant financial costs to the company, especially considering the indefinite repeal of its export licence. He labelled it "the biggest crisis I've ever had to face as a boss".

Legal action

However, the Association of Victims of Salmonella Contaminated Milk (AFVLCS) claimed that about another 10 infants have been contaminated, and are angered they have not been linked to Lactalis.

The AFVLCS stated "this is a health scandal of unprecedented scale" and it "implies that the victims could have been much more numerous".

Although Besnier insisted the company is cooperating with the authorities' ongoing investigation, many have argued that greater transparency is needed going forward. AFVLCS President Quentin Guillemain claimed that any compensation offered by Lactalis would not be warmly received by the families of those affected.

"It seems that Mr Besnier is quick to distribute his money to the victims so that they keep quiet," he said. "Well, I tell you, we will not be silent."

Not only is the victims' association targeting Lactalis with multiple law suits, but it also intends to highlight the role of French supermarkets in the spread of the disease. It was revealed that Leclerc, Auchan, Carrefour and Systeme U did


not remove Lactalis products from their shelves even after they were recalled.

Working alongside the AFVLCS, non-profit campaigning organisation foodwatch agreed, arguing that the manufacturer, supermarkets, laboratories and public authorities have "failed the consumer". It suggests there were 12 breaches of the law, and plans to press charges for marketing a product dangerous to health, failure to warn and withdraw the products, endangering others, committing an involuntary act on the physical integrity of a person, and exporting a food product harmful to health to another European Union country.

The decision to take legal action is prompted by the fact that many food issues in the past have been overlooked. Instead, Ingrid Kragl, the director of information of foodwatch, said "The penalties should be deterrent and exemplary."

Preventive measures

The Pasteur Institute is carrying out a multicountry WGS analysis to determine how the milk was contaminated, and identify and address weaknesses in the production process.

Any confirmed cases of *S. Agona* should be reported to EPIS-FWD (Epidemic Intelligence Information System for Food- and Waterborne Diseases and Zoonoses). 

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Avoiding major slip-ups

Spills can happen at any time during the manufacturing, preparation and serving of food. Not only are spills a major slip hazard, they can contaminate food preparation surfaces and spread infectious germs to unsuspecting staff or customers. Personal injuries that spread blood or bodily fluids can also pose a health and safety risk to people.



Not all spills are equal, either. When it comes to cooking oil and grease, these stains need to be cleaned up properly to ensure the surface isn't still slippery. Without the right products and not informing staff on the correct clean-up procedure, businesses can be liable for a personal injury claim.

For any spill situation, a rapid response is vital to protecting staff and customers from harm and the spread of infectious disease. That's why any facility that handles food needs to have a spill management system tailored to its exact needs.

But what kind of products and methods can businesses use to manage hazardous spills? Let's take a look at the different kind of food handling environments and the most effective way to manage spills.

Food preparation areas

Commercial kitchens are the most common kind of food preparation area. Depending on the type of venue, the kitchen



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may be separate from where the food is served or localised into one large room, such as a fish and chip shop.

Chefs, wait staff and kitchen hands are most at risk of a spill hazard. The most common types of spills include food being spilled from the countertop onto the floor, blood being spread onto the countertop or floor, and an employee or customer being sick on the floor.

Any spill in a food preparation area needs to be treated equally and removed as soon as possible. For this reason, all commercial kitchens should have cleaning equipment on-site to increase response times. General-purpose absorbent pads are a fast and effective way to remove isolated spills. These can be applied to any kind of spill and prevent the risk of slipping or contaminating the surface. Some absorbent pads may be able to speed up the cleaning process through bioremediation, which naturally alters the environment to remove infectious germs and other contaminants.

Transportation

Whether stock is delivered to a restaurant, supermarket or retail store, the contents need to be secured properly to prevent unwanted movement and spillage. Cold and hot products should also be stored at the correct temperature and kept separate from harmful materials to prevent contamination.

The risk of spillage and contamination can be severe. Not just for businesses ordering the stock, but for the transport companies that deliver the goods. If the food content is damaged or spills inside the trailer, cleaning up can cause operational delays and the offensive odour can linger for several weeks.

Extra precautions should be made to ensure stock is safely delivered to its destination. Furniture felt is an effective way to increase the friction of surfaces where stock is placed. Made from needle-punch synthetic fibre and measuring at a thickness of 450 gsm (grams per square metre), it can be used to absorb any kind of solid or liquid spill. Furniture felt can also be washed and re-used again and again. For maximum coverage of stock, industrial rags are a cost-effective way to aid with packing, surface protection and spill cleaning. Available in a range of fabrics, bag sizes and rolls, they're a versatile solution for any transport-related spill.

Equipment and machinery

Cooking and cleaning machinery should be cleaned on a regular basis to keep it free of oil, grease and offensive odours. However, manual scrubbing and using store-bought cleaning products can be time-consuming for businesses. The latest ranges of hot spray wash machines and flub-based parts cleaning machines are specially designed to reduce downtime and ensure kitchen machinery meets industry standards.

Whether automated or a manual fluid-based machine, these stations are custom built to meet the specifications of any workplace. They require no special training and can effectively remove oil, grease and hydrocarbons from individual components of any size.

Spill management is an ongoing challenge for the Australian food industry. Due to the range of spill types and the circumstances where they can occur, it pays for business to invest the time and resources into their own spill management plan.

After all, what business can afford the cost of a major slip-up?

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Do you have to stick with smelly glue?

Do adhesives have to be smelly? The short answer is “No”.

The Department of Sensory Analytics at the Fraunhofer Institute for Process Engineering and Packaging IVV looked at solvent-based, solvent-free and minimal-solvent acrylic adhesives and found that all can emit pungent odours.

They then investigated four solvent-free adhesives more closely to find the chemicals that trigger the offensive odours.

Of the 27 different unpleasant odorants found, 20, including borneol, had not previously been identified as being odour-active compounds in adhesives. Other odorants included methyl methacrylate, acetophenone, 1-butanol, 4-methylphenol, phenylacetic acid, methyl ester and acetic acid. Some of the samples contained phenolic compounds suspected of being mutagenic.

The smelly chemicals presented a range of odour profiles ranging from pungent, fruity and leathery to smoky and mouldy.


“If a product emits a particularly strong odour, this can indicate the presence of hazardous substances,” said Prof Büttner, who is the department head and deputy director of Fraunhofer IVV. “Our analysis shows that a series of substances we found ought to be eliminated, and not just in terms of odour emissions. Strong odours can most definitely cause headaches and dizziness. We should be asking why adhesives smell. The mindset of both the user and the manufacturer needs to change in this regard.”

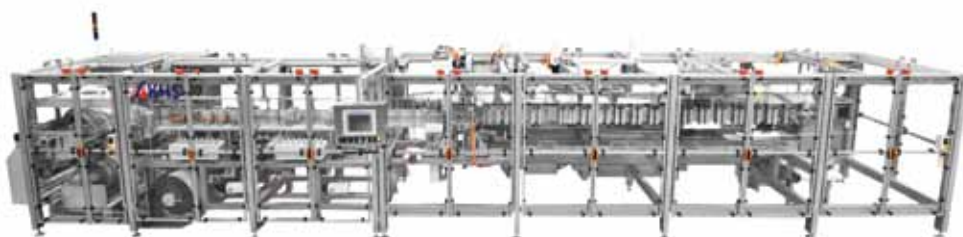
For their analyses, the researchers rely on different methods and devices, such as gas chromatography and mass spectrometry; these enable them to carry out simulated exposure studies in real-life situations to detect and quantify

the substances being emitted. In other words, the researchers determine how much is being emitted in normal use. In short: the analytical requirements are high. The detection methods must cover as broad a spectrum of chemical substances as possible, since odorants are not a chemically uniform group. Their only commonality is that they are volatile. In addition, the analysis must differentiate between odour-active and -inactive substances. Machine detectors are only partly capable of achieving this, which is why the human nose is still irreplaceable. It is also the reason why sensory tests are conducted at the start of the analysis.

Weekly sensory training sessions are held at Fraunhofer IVV to train test subjects on becoming odour experts. The test subjects are given samples in odourless glass containers. The sensor panel sets characteristic odour attributes for each sample; in a second sensory session, it evaluates them against reference compounds on a predetermined scale. The overall intensity and the personal preference or dislike of an odour impression is then evaluated, with the mean values of the evaluations being used to summarise an odour profile.

The expert on adhesive materials is Philipp Denk, who researches all types of adhesive components — for example, in food packaging and the medical sector. His current focus is the acrylic adhesive group, following which he will analyse physio tapes, some of which also contain odour-intensive compounds.

The research findings have been published in the *International Journal of Adhesion and Adhesives*. 



Pouching machine with servo equipment

The Innopouch Bartelt K series from KHS is a pouching machine with a full range of servo equipment. It has short set-up times, a high level of productivity and can be combined with the KHS Innopack Bartelt CMC cartoner for a pouch packaging line from a single source.

The poucher is available in two versions: an FS (fill and seal) machine for pouch filling and an FFS (form, fill and seal) variant for pouch production and filling. The production stage can be flexibly retrofitted from the FS to the FFS version at a later stage as the machine is modular.

The horizontal, cyclic packaging system makes stand-up, flat and bottom gusset pouches from film laminate. It can run in both simplex (one pouch per machine cycle) and duplex (two pouches per machine cycle) operation. The Innopouch K-400 changes formats at the press of a button using linear servotechnology.

The machine produces up to 150 pouches/min in duplex operation measuring between 100 and 380 mm in height and 100 and 400 mm in width. The maximum weight is 2.5 kg. It can produce large pouches, such as for pet food, or small bags for salty snacks or dried fruit.

The standard version of the machine has four filling stations connected in series which can be added to as required. The dosing systems are selected according to the product to be filled, with volumetric systems, such as auger fillers, table feeders and sliding gate fillers, and gravimetric systems like multihead weighers all possible.

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The system consists of a Pro-Seal GTR Trayseal Machine and includes the PER 30 Laser from PerfoTec. It also comes with test material like punnets and Sealapeal PSF — an ultratransparent and easy-to-peel film.

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Aseptic filling for Nectar

Serbian fruit juice producer Nectar covers all stages of the value chain: from its own plantations through purchasing, fruit processing and cooperation with fruit farmers to the finished product.

Until very recently the company pasteurised and filled sensitive products using ultraclean filling technology (UCF), where overpressure is applied to the filling and capping zone. The air is fed in through filters to prevent any possible microbiological contamination. In addition, the empty bottles are first filled with nitrogen to improve the microbiological quality of the filling process.

In order to satisfy its own growing demand for quality, Nectar has now opted for aseptic filling. This allows its range of products to be considerably expanded — both with regard to the fruit content and the various flavours and product variants in all categories.

“For us, the most important thing is that we can now carry out this process under sterile conditions,” said production manager Milka Tomanović. “This retains the natural properties of the fruit. We have a better quality of final product and can offer greater microbiological quality over a longer period.”

Creating sterile conditions for aseptic fillers is a tricky undertaking. It was thus soon clear to Nectar that the only technological partners to come into question were certified systems manufacturers proven worldwide.

Nectar had become convinced that the high standard it required for its own products could only be achieved by using equipment of an equally top quality. The company opted for an Innosept Asbofill ABF 711 C — the first aseptic filler of this kind for the production of fruit juice in Serbia.

The line has a capacity of 12,000 bottles/h and processes 500 mL, 750 mL and 1.5 L PET bottles. Nectar not only invested in a filler but also in a stretch blow moulder by seizing the opportunity to acquire a used, fully overhauled system from



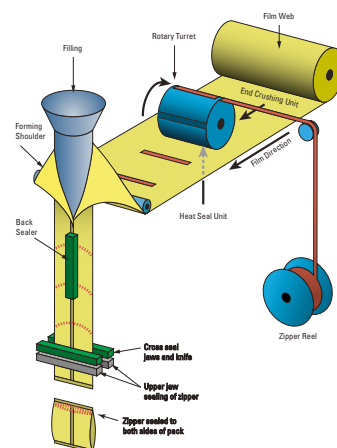
KHS. Including all air conveyors, discharge to the packaging and palletising section and an Innocheck FHC fill height control system, the investment came to about €3.5 million.

“With our new line we’ve been able to greatly boost our efficiency — on the one hand thanks to the much higher capacity than on the old line and on the other through a reduction in downtime and larger production series,” said a very happy Tomanović.

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Confectionery vertical form fill seal machine

The GEA SmartPacker TwinTube C achieves up to 500 pillow bags/min. It handles products smoothly, so it is suitable for fragile products.

The product-in-seal detection system that stops products from being stuck between the sealing jaws is useful for confectionery such as gummy candy. Being able to produce smaller 'snacking packs' at a high speed, the packer allows confectionery brands to respond to consumer demand for smaller snack sizes to consume calories more consciously.

The machine is also designed to perform reliably with long narrow bags, popular for party mixes. This is a size range with which most vertical form fill seal (VFFS) equipment has difficulties.

Compared to running a conventional line at up to 120 bags/min, a single packer can replace four machines. It has a lower initial investment, lower energy consumption and lower operator and maintenance requirements. In addition, the savings in factory floor space also leaves room for other equipment.

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Question time ...



How can you get more out of your track-and-trace?

This Q&A outlines how today's manufacturers are using track-and-trace as a strategy to better see and manage the entire ecosystem of their production facilities, making smarter manufacturing a reality.

Q. What is "track-and-trace"?

A. Track-and-trace is the ability to identify and track a product from its point of origin all the way through the supply chain to the end consumer. For this to happen, it needs unique identification at all packaging levels: item, carton and pallet.

Q. Does this have anything to do with GS1 Standards?

A. Yes, this is where GS1 Standards and the relevant ID technology solutions come into the picture. With each product uniquely identified and labelled, trading partners can exchange information at every step, from manufacturing to consumer.

Q. How can track-and-trace help create the "factory of the future"?

A. In several ways:

Better transparency: a robust system can record virtually every movement and operation, giving better visibility.

Supplier checks: suppliers can demonstrate proof points from origin and understand which components have gone into which product variants.

Driving production efficiencies: because the system collects data at all stages of the product journey, manufacturers can benefit from complete line monitoring then use this information to maximise the plant's overall efficiency while cutting operational costs — essentially the Industrial Internet of Things (IIoT).

Faster and easier compliance: many government regulations demand food-product traceability from point-of-harvest to point-of-sale; Australia's Food Standards Code requires manufacturers to trace items "one step back and one step forward". Beyond complying with regulatory safety requirements, leading manufacturers aim for exceptional quality to distinguish their brand.

Protect against theft and counterfeiting: future growth for manufacturers depends on brand trust and supply chain safety and integrity; track-and-trace enhances these.

Build consumer trust: the ability to track a product and know its whole journey from farm to consumer allows good food safety management. It's also an opportunity for food companies to build consumer trust and loyalty.

Improve inventory: knowing inventory levels throughout supply chains makes inventory planning and management more efficient. Data-set patterns over time allow anticipation of demand shifts to optimise production efficiency. (Think Just In Time (JIT).)

Track-and-trace creates a defence against counterfeiters and recalls. It also gives the opportunity to improve operations, quality, efficiency and consumer trust.

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How magnetic separators and metal detectors work together

Correct procedures and correct equipment for metal fragment control are essential to maintaining food safety initiatives and protecting your product and brands.

In years past, magnetic separation and metal detection were mainly for protection of machinery. Today, food safety is paramount. Protection of products, consumers and brands has never been so important. It can be demonstrated that both high-grade rare earth magnets and efficient metal detectors are essential to satisfying today's product security requirements in the food industry and greatly complement each other to ensure metal risks are significantly reduced.

Many companies only use magnets, some only use metal detection. Both are equally important... let's put them into focus.

The role of metal detectors

Metal detectors, as taught in TAFE colleges, may still be overemphasised in the HACCP doctrine in a manner which overshadows the relative importance of ultra-high-intensity rare earth magnet capabilities in metal fragment extraction. This is especially so since the availability of RE80 magnetics which can present 10–12,000 gauss strength to the product at CCP or final packing locations.

A metal detector will reliably indicate the presence of stainless steel/brass nuts and bolts, stainless steel nuts and washers, copper wire, aluminium foil and other even larger non-ferrous contaminants — this is where the metal detector really shines.

Although theoretical indications on 0.04"/1 mm spheres of iron can be achieved in ideal circumstances, it should be remembered that 316 stainless steel is a very different story. The shape of the stainless steel piece can make it difficult to detect at certain

orientations as it passes through the aperture of the metal detectors. In practice, this can sometimes mean detection of only 0.12"/3 mm or larger particle size. This can mean fine wires or other dangerous smaller fragments remain in the outgoing products.

However, stainless steel fragments and wires of 0.12"/3 mm size and under are usually work hardened. This means such fragments can be extracted magnetically along with other contaminants such as magnetic stone — this is where magnetic separation equipment is essential to ensure maximum product security.

The role of magnetic separation equipment

Many respected organisations now share the view that it is of first importance that ultra-high-intensity magnets should be installed upstream of high-sensitivity metal detectors and X-ray units. Both have limitations but both are necessary and complement each other.

Without efficient magnets, there is a high risk that fine ferrous metal and fine magnetic fragments will escape even the most sensitive metal detectors. Without efficient magnets, larger pieces will be detected by the metal detectors but excessive product rejection can occur where the detector is properly calibrated. The causes of rejection in these circumstances are often difficult to locate in bags or bins of bulk product. Consequently, it is much better to pull ferrous and other

magnetics out first with efficient RE80 magnets conforming to the current HACCP International Magnet Standard.

They may be small, but even fine fragments can cause product recalls and other consequences.

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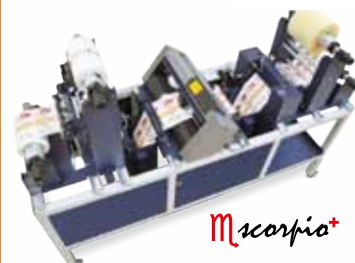
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What'll this do to the gluten-free market?

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Clinical trial may make gluten intolerance obsolete.

'Gluten free' is a very popular dietary choice at the moment. This has been great for the genuinely gluten intolerant coeliac disease sufferers as their choice of foods in supermarkets and restaurants has expanded dramatically.

Now the University of the Sunshine Coast's Clinical Trials Centre is starting a clinical trial of a new vaccine that aims to switch off the immune response to gluten. This will mean that, if the trial is successful, coeliacs will be able to consume gluten without suffering any adverse effects.

This really is a breakthrough for those who suffer from coeliac disease.

But what about the whole 'gluten free' industry? Will those electing to follow a gluten-free regime continue if it is established that the whole problem can be abolished with a vaccine? Interesting times.

Interested in the clinical trial?

Coeliac disease is a serious chronic medical condition in which the ingestion of gluten, even in small amounts, leads to an immune response that causes damage to the small intestine.

Sufferers struggle with various gastrointestinal symptoms and, if untreated, face potentially serious complications. Currently, the only way to manage the disease is by the strict avoidance of gluten in the diet.

USC's Clinical Trials Centre Director Lucas Litewka said the investigational vaccine would be given to trial participants as an injection twice a week for seven weeks.


He said the trial would be conducted alongside gastroenterologist Dr James Daveson at the Clinical Trial Centre on Sippy Downs Drive, Sippy Downs.

Dr Daveson said a gluten-free diet was exceptionally demanding for patients, expensive and difficult to maintain as gluten was used extensively in modern food production.

"There is a real unmet need for therapies other than the gluten-free diet for some people with coeliac disease," he said. "This is a very exciting potential new therapy that has been undergoing clinical trials for several years now."

Dr Daveson said the investigational vaccine might potentially restore gluten tolerance in coeliac disease sufferers.

Adults between the ages of 18 and 70 can take part in this trial if they have medically diagnosed coeliac disease and have been following a strict gluten-free diet for 12 months or more.

Those who meet the criteria and are enrolled in the study will be compensated for their time. Patients interested in participating can go to www.joinourtrials.com or phone (07) 5456 3797. 

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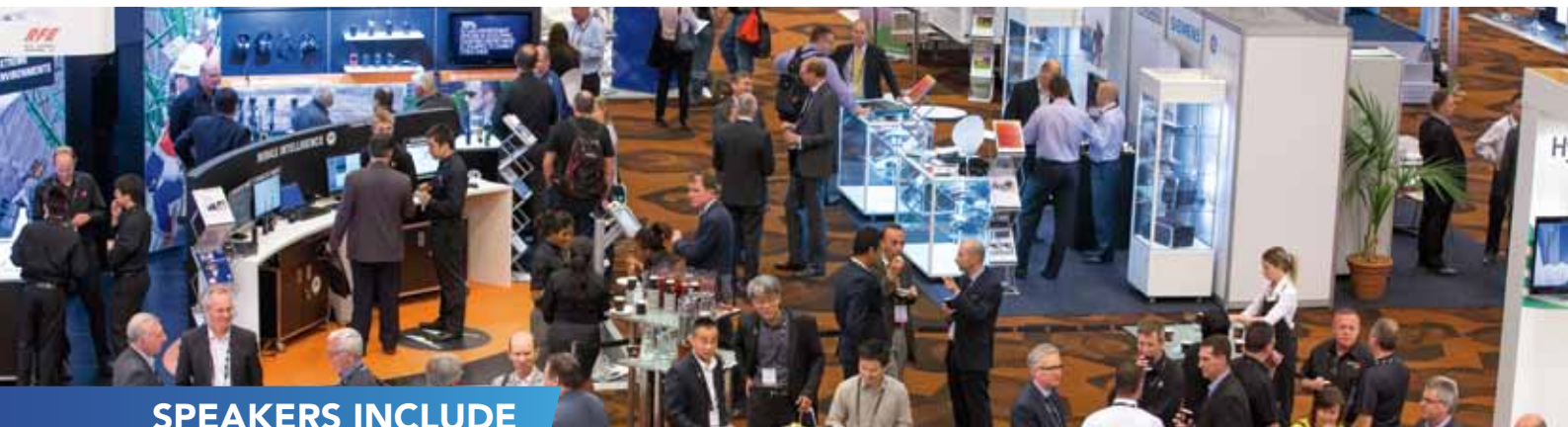
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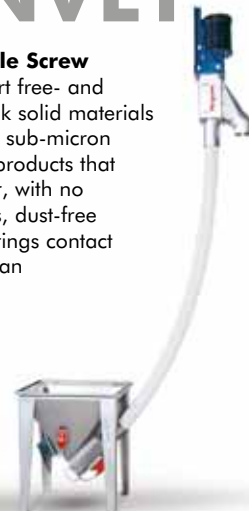
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