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It's been great... but it's time to go

After more than 21 years of editing *What's New in Food Technology & Manufacturing*, I am retiring and this is my final issue of the magazine.

My initiation as editor of the title was the September/October 1997 issue. In those days there was no associated website; in fact half of the magazine was still printed in black and white. The editorial department had one, shared DOS-based computer and we handmarked our copy and couriered it to a typist on the Northern Beaches.

We are now vastly more automated, we have websites and our turnarounds can be done in hours rather than weeks. But while the food industry has also embraced automation, lots of things have not changed. My first issue included an article titled 'Using waste from the sugar industry for energy generation' — so we were obviously starting to consider sustainability even before the use of the term became so ubiquitous.

Also in my first issue was a preview of AUSPACK 1997 — and AUSPACK is still going strong as well. The front cover was about a new packaging innovation — stand-up pouches. Hygiene, coding, logistics, flavour management, labelling, packaging, food testing and labelling were all featured in the issue and are all still just as relevant today.

I have loved my time editing the magazine; I genuinely enjoy the food industry and will miss knowing what is going on, who is doing what with whom and what developments



are imminent. Each year's passing parade of superfoods and learning more about consumer behaviour and how food purchases come about are other things I will miss, along with all the people I have met, harassed and had the odd red wine with.

Food contamination crises and the expertise required to identify the source and limit risk to the public I have always found fascinating, but it is time to go.

I wish only good for the Australian and New Zealand food industries, which are absolutely world class. If I had to offer one piece of parting advice it would be on the benefits of collaboration and networking. Active participation in industry associations is a fast way to improve individual and company knowledge — after all, we are all in this together.

To those who read the magazine and/or eNewsletters and to the contributors — advertising and academic — thank you for giving me the opportunity to participate in an enthralling and intriguing industry.

What's New in Food Technology & Manufacturing and www.foodprocessing.com.au will continue to thrive and I hope you will all continue to use it to find out about new products, processes, people and ideas.

Cheers and farewell,

Janette Woodhouse

A perfect view – even with condensation!

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And the most popular soft drink is... water

Sometime this year bottled water consumption will globally trump all other soft drinks including carbonates, juices, energy, sports, concentrates, ready to drink teas and coffees to become the most consumed non-alcoholic cold drink.

Since 2007 bottled water consumption has increased 92% — this equates to very nearly 7% growth each year. In 2017 bottled water consumption was 418 billion litres while all other soft drinks accounted for 438 billion litres. But growth in soft drinks has only averaged around 2% each year since 2007, which means that bottled water is now higher than all other soft drinks combined.

It is hard to decide if this is a marketing triumph and a triumph for public health or an ecological nightmare.

The information comes from the Zenith Global globaldrinks.com database, which was originally introduced in 2000 and has become the definitive business planning reference for many companies

in the beverage industry as well as others seeking to understand and compare national market characteristics against regional or global trends.

Zenith's Richard Hall demonstrated the power of the database by comparing bottled water prices for five market segments over the past 10 years. "This shows that the vast majority of bottled water is not only healthy, convenient and local, it is also very affordably priced with virtually no increase in average prices during the past 10 years.

"The price of bulk water in packs over 10 L has consistently averaged out at US\$0.15 or less per litre and the average for smaller packs of still water has not risen above US\$0.65 per litre. Nevertheless, there is a strong premium for other waters, with sparkling water averaging up to US\$0.97 per litre, flavoured water up to US\$1.49 per litre and functional water up to US\$1.95 per litre.



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UK's sugar tax has raised over £150m so far

In the UK, 457 beverage companies have elected to pay the Soft Drinks Industry Levy (SDIL) since it was introduced in April 2018. By the end of October the levy, which applies to the packaging and importation of soft drinks containing added sugar, had raised £153.8 million and 90% of the companies were paying the higher rate:

- The 'standard rate' (18 p/L) applies to drinks with sugar content between 5 g and up to (but not including) 8 g/100 mL.
- The 'higher rate' (24 p/L) applies to drinks with sugar content equal to or greater than 8 g/100 mL.

Politicians are lauding the positive impact the soft drinks levy is having as it is delivering millions of pounds for sports facilities and healthier eating in schools.

In total 660 million litres of soft drink have been taxed — 256 million litres in the first quarter and 395 million litres in the second quarter. With the second quarter covering the British summer (July–September) the increased volume in this quarter has been put down to seasonality, but it is acknowledged that some trader behaviour prior to the levy's introduction may also have had an impact.

Public Health England is monitoring the sugar reduction program and claims that the legislation has resulted in an 11% reduction in the sugar content of soft drinks. However, its next progress report is not due until Spring 2019 so we have no indication of whether or not the levy is reducing childhood obesity in the country.



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Triple capacity at tna's new site

Global demand for its high-performance food packaging solutions led tna solutions to commission a brand new manufacturing facility in the Melbourne suburb of Boronia. Now officially opened, the new factory will allow tna to triple the manufacturing capacities for its cutting-edge equipment, including its flagship vertical form fill and seal (VFFS) packaging system, the tna robag.

For a company that started with an idea for the world's first rotary, continuous motion, high-speed VFFS system drawn on the back a coaster more than 35 years ago, tna has come a long way. It holds 34 patents in Australia for its equipment designs and many more internationally. Currently, the company has 14,000 of its systems installed across more than 132 countries.

And this success is set to continue with the new factory, which will incorporate a training and demonstration centre to provide customers and new staff with an opportunity to experience tna's equipment in a live operational environment. In combination with tna's wide range of on-site and online training programs, the new training facility will help customers improve workplace safety, reduce downtime, enhance operational efficiencies and maximise the lifespan and performance of their tna solution.

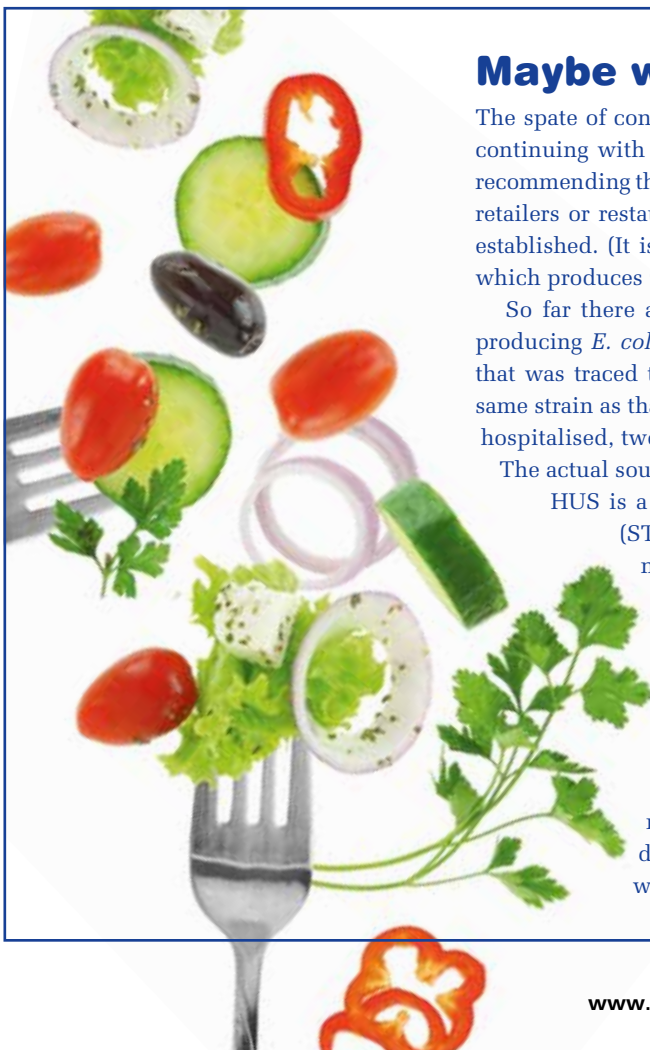
Founded in 1982 by Nadia and Alf Taylor, tna has grown from Australian packaging pioneer into a global leader of food processing and packaging solutions for a wide range of industries, including snacks, confectionery, and fresh and frozen produce.

The opening of the new manufacturing site in Australia follows the opening of a food processing centre in the Netherlands, which



is dedicated to tna's processing equipment, including its range of fryers and freezers, but also pre-processing equipment such as peelers, washers and dryers. This adds to recent openings of new and expanded offices and resource centres in Tokyo, Bangkok, Dubai, Moscow and Mexico.

"tna's growth has been incredible over the years," commented Alf Taylor, Managing Director and co-founder, tna. "We've come a long way since we opened our first factory in Melbourne in 1986. Since then, the demand for our integrated packaging solutions has increased rapidly. In fact, we've just sold 84 integrated packaging systems in a single month, which are all due for delivery in early 2019. Thanks to our new site, we'll not only easily be able to meet such high-volume orders, but also gain the capacity to expand our operations even further in the future. We're really proud of our new Australian manufacturing facility and can't wait to welcome everyone at the new site!"



Maybe we should just cook our salads

The spate of contaminated leafy greens sickening people in the US and Canada is continuing with the CDC announcing yet another outbreak. The CDC is currently recommending that US consumers should not eat any romaine lettuce and nor should retailers or restaurants serve or sell any until the source of this latest outbreak is established. (It is being conjectured that the source is likely in Monterey County, which produces 960 million heads of lettuce each year.)

So far there are 32 Americans and 18 Canadians infected with Shiga toxin-producing *E. coli* O157:H7. This outbreak is not the same strain as the latest one that was traced to contaminated canal water used for irrigation. Instead, it is the same strain as that of the 2017 outbreak where 25 illnesses were reported with nine hospitalised, two developing haemolytic uremic syndrome (HUS) and one fatality.

The actual source of this outbreak was never unequivocally established.

HUS is a particularly nasty complication of Shiga toxin producing *E. coli* (STEC) infections. *E. coli* O157:H7 is the most common serotype but not the only bacteria that can cause HUS. In 2011, *E. coli* O104:H4-contaminated fenugreek seeds hit Germany with 800 of the 3800 people affected going on to develop HUS and 36 deaths. German doctors are concerned that the country will not have enough kidneys available for transplants in the future to cater for the needs of those who developed HUS following ingestion of the fenugreek seeds and sprouts.

Washing leafy greens will reduce the loads of pathogens but will not eliminate risk completely. As few as 10 *E. coli* bacteria can cause disease, and washing will never reduce the loads to a safe level. So what is really needed is a kill step. Boiled lettuce anyone?



Krones acquires Chinese process technology company

Manufacturer of filling and packaging technology Krones has acquired its long-term Chinese partner and supplier Shanghai Xiantong Equipment Installation.

Operating under the name Krones Processing (Shanghai), the new company will deliver turnkey process technology solutions around the globe, especially for breweries.

Under the acquisition, Krones now owns a production site for brewing equipment and other process technology solutions in China. It expands the company's global footprint and caters to growing local and international demand for customised process technology solutions.

The team of around 170 people covers the entire value chain from engineering to manufacturing to installation and commissioning.

The acquisition builds on Krones Taicang and Xiantong's 20-year partnership which saw them produce process technology equipment for the local market. For example, Krones' first MicroCube compact brewhouse was manufactured by Xiantong.

Company headquarters will continue to be in Fengxian District, in southern Shanghai, but there will be a leadership change. Xiantong's former owner, Liang Kun, will act in an advisory capacity in the new company, and the previous head of corporate development at Krones Taicang, Cheng Feng, will take over as Managing Director.

Meat, dairy and egg demand to grow 70%

By 2050 it is anticipated that food demand will have risen by more than 50%, with demand for animal-based food products (meat, dairy and eggs) likely to grow by almost 70%. Meeting this increased demand will be essential if the nearly 10 billion people alive then are to be fed.

How can the agriculture and food industries produce this much food without exacerbating poverty, accelerating deforestation and increasing GHG emissions? A report, *Creating a Sustainable Food Future*, produced by WRI, in partnership with the World Bank, UN Environment, UN Development Programme, CIRAD and INRA, has been looking at this problem and recommends we start making substantial changes to our food system now.

The report includes a menu of 22 options that suggests it is possible to feed everyone sustainably. The top five recommendations are:

1. Reducing demand by cutting food loss and waste, eating less beef and lamb, using crops for food and feed rather than biofuels, and reducing population growth by achieving replacement fertility levels.
2. Increasing crop and livestock productivity to higher than historical levels but on the same land area.
3. Stopping deforestation, restoring peatlands and degraded land, and linking yield gains to protection of natural landscapes.
4. Improving aquaculture and managing wild fisheries more effectively.
5. Using innovative technologies and farming methods that lower agricultural GHG emissions.

Limiting global warming will mean acting on the food sector

As things stand, agriculture, including the resulting land use changes, accounts for some 25% of global emissions (12 Gt of CO₂ per year). The figure could reach 15 Gt of CO₂ by 2050, ie, more than 70% of the global 'carbon budget' set in the Paris Agreement to limit global warming to less than 2°C. This would leave just 30% for other sectors that generate greenhouse gas emissions, such as transport. The report explains how the world could reduce agricultural GHG emissions by two thirds (to 4 Gt of CO₂) by 2050.

Food lies behind most environmental and development issues: deforestation, malnutrition, biodiversity loss, water scarcity, climate change, water pollution and more. By improving how the world's food is produced and consumed, we can treat the cause and not just the symptoms.



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NZ's getting a new spray dryer for the sheep milk industry

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Due to predicted growth in the sheep milk industry, Food Waikato has invested in a new company, Melody Dairies Partnership. This investment will boost the nutritional spray drying capacity at Waikato Innovation Park in Hamilton.

Food Waikato specialises in the manufacture of sheep, goat and nutritional powders. It is New Zealand's first independent spray dryer capable of developing new products, from concept to commercialisation. The commercial-sized processing plant provides scale-up opportunities and access for independent milk suppliers and nutritional brands looking to produce milk or ingredient powders.

Melody Dairies' four investment partners will jointly finance and build a second spray dryer at the Park, which will be managed by Food Waikato.

The four partners are Nu-Mega Ingredients (NZ), a company owned by Clover Corporation, with a 35% stake in Melody Dairies; Landcorp Farming, with a 35% in the partnership; Dairy Nutraceuticals, with a 20% share; and Food Waikato, also known as New Zealand Food Innovation Waikato, with a 10% share.

Clover Corporation is an Australian company listed on the Australian Stock Exchange. It is known for its range of patented micro-encapsulated products containing omega three oils, created through the spray drying process, used in the manufacture of high-quality infant formula.

"We are delighted to attract an investor of this calibre who has leading-edge, patent technology in the specialist ingredients area," said Food Waikato CEO Stuart Gordon. "We look forward to continuing the strong relationship we already have with Clover Corporation."

Clover Corporation has been a customer of Food Waikato since 2014, regularly utilising the first spray dryer built at the Park.

Clover Corporation's CEO and Managing Director, Peter Davey, said its investment in Food Waikato will help the company meet the fast-growing demand for its products from both the infant formula and functional food markets. The partnership allows Clover use of the facility for spray drying its products.

The investment from other partners, Landcorp and Dairy Nutraceuticals Limited (DNL), is also significant for Food Waikato.

"It's a mega coup for us as Landcorp implement their Pāmu Farms of New Zealand brand strategy, in particular their joint venture with Spring Sheep Milk Company," said Gordon.

Pāmu is the brand name for the government State-Owned Enterprise (SOE) Landcorp Farming Limited, which owns a

nationwide portfolio of farms including sheep farms. They are partners in Spring Sheep Milk Company, a boutique nutrition company which creates and exports high-value branded nutrition food products made from sheep milk.

Gordon said that the sheep milk industry was expected to double in size by the year 2021, and a new spray dryer will be in demand.

"Dairy Nutraceuticals Limited have just built a state-of-the-art blending and packing plant in Auckland, and they also lead the way in technology and innovation, so it's an ideal partnership."

Established in 2016, DNL is a New Zealand-based dairy processing and nutritional food manufacturer with a focus on innovation and pioneering new products to local and global markets.

The Food Waikato plant opened in May 2012. The existing open access development dryer is running at capacity, with 300 days of production for the year to June 2018, producing \$51 million in export product for the year.

The existing dryer will continue to be available to develop new businesses and products, with increased capacity available through transfer of some clients to the new dryer, due to Food Waikato's 10% ownership of capacity in it.

The new \$50 million industrial spray dryer will be built alongside the existing dryer and will have 2.4 times its capacity. It is projected to deliver \$129 million in exports a year.

"This is an exciting moment for the growth of the sheep milk industry, and we are proud to be part of that growth," said Gordon.

He said that sheep milk had "three key points of difference" which was helping to drive its commercial and export appeal. "There is emerging evidence of a lower environmental footprint than bovine dairy; there is evidence that sheep's milk is more easily digested than cow's milk; and it has a great taste," said Gordon.

"The Food Waikato plant has become a centre of excellence for the industry, and we have supported many companies with their product development to take high-quality New Zealand food innovations to a global market," said Gordon.

The new dryer will be designed and built by Waikato Innovation Park tenant company Tetra Pak, and construction will begin in late 2018. Gordon said the spray dryer will be up and running by December 2019.

Once completed it is expected employment at the plant will grow from 17 to 35 staff.



what's new in
Food
technology & manufacturing

Prepared food & ingredients



Disposable, edible dishware



First you eat your lunch and then you eat the plate and cup.

Apple glass can be eaten after use.

@SamaraPolytech

In Russia, Samara Polytech scientists have taken the concept of edible food packaging to a whole new level by developing edible dishware.

The project started during the development of a new diet for astronauts which included edible food films made from natural raw materials.

"Initially, we sought to create a package that would allow to store, to heat and then to eat along with the food. Other packaging in space is inconvenient: it is difficult to dispose," said Nadezhda Makarova, project manager and head of the Technology and organisation of public catering department.

The product created by Samara Polytech scientists is made exclusively from natural ingredients. No dyes or preservatives are used. Being made of vegetable raw materials the film has few calories, so it can be considered a dietary product.

Chemical processes that entail deep chemical changes are not carried out in the production of edible films. The developers apply the standard processes that take place in the food industry (mixing, concentrating, forming layers of raw materials). First, scientists get fruit or vegetable puree, then they form a mass with a plasticiser and dry the finished layer

at a temperature not higher than 60°C.

The edible dishware is made using similar technology, the only difference is that the viscous mass is poured into a special form and then dried.

While developing food films, the scientists experimented with raw materials from various fruit, berries and vegetables, such as apples and carrots, currants and black chokeberry, plums and strawberries, green beans, pumpkins, blueberries. However, an apple is more suitable for dishes because it has the best taste and viscoplastic properties. And, the apple glass turned out so strong that you can pour boiling water into it.

Tasty dishware, just like edible packaging, in the first place will help to solve the problem of waste disposal. After use, it can be simply thrown away or eaten, and if placed in water, it will completely dissolve in 12 hours.

In the future, scientists plan to produce whole sets of disposable dishware. They started with glasses because they are the most popular type of trash. On average, one glass costs 30–40 roubles, now scientists are working to reduce the cost of the manufacturing process. The authors of the project have applied for a patent for the apple technology. 🐮



Pliable butter sheets

Maxum Foods provides Canary Butter Sheets which are made from New Zealand creamery butter. Pliable enough to use straight from the fridge, these butter sheets are suitable for croissants, Danish pastries and puff pastry.

Canary Butter Sheets improve the consistency and quality of pastries by ensuring an even distribution of butter, producing a flaky, gold exterior. Easy to work with, the butter sheets have a melting point of 37°C so the butter sheets will not soften too quickly. Plus, users will save time prepping butter which will speed up production.

Store chilled or frozen, Canary Butter Sheets are available salted or unsalted. The butter sheets are layered between HDPE film, and enclosed in a plastic liner bag and an outer carton to ensure they remain fresher for longer. They are provided in 1 and 2 kg formats.

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Honey — adulteration and now botulism

Poor old honey — first involved in adulteration allegations and now implicated in four cases of infant botulism.

Since August, four babies in Texas have been hospitalised with botulism and it is thought they got the disease after being given honey-filled dummies that had been purchased in Mexico.

The honey filling the dummies isn't there to be consumed by the baby, but is used to make the dummy soft and pliable. However, a small hole or rupture means the honey can get into a baby's mouth by accident. And if this happens and the honey contains botulinum spores and the baby is less than 12 months old, you have a potential disaster.

Soil, mud, water, the intestinal tracts of animals and honey are known sources and reservoirs for *Clostridia* spores which can multiply in a baby's immature digestive system and produce the botulism toxin. It is this toxin that causes difficulty breathing, muscle paralysis and even death in children under one year. Older children and adults are not affected as their more mature gut microbiome and digestive systems can deal with the *Clostridium botulinum* spores.

Some of the published scientific studies appear to suggest that a figure of around 10% of all honey typically contains a small number of botulism spores. It also seems that unpasteurised honeys may be slightly more likely to have the spores.

In Australia, *Clostridium botulinum* infection is an 'urgent' notifiable condition and must be notified by medical practitioners and pathology services immediately by telephone upon initial diagnosis (presumptive or confirmed).

Between 2003 and 2015 four cases of infant botulism were diagnosed in the Mildura region. It is not known if honey was the source of the disease in these children. Californian research has shown an association between dust storms and earthquakes and botulism incidence.

The FDA is reminding parents and caregivers not to give honey to infants or children younger than one year of age. This includes dummies filled with or dipped in honey.

Adulteration uncertainty

"Testing uncertainty" has led the ACCC to conclude its investigation into allegations Capilano Honey breached the Australian Consumer Law in relation to representations about its 'Allowrie' honey and other products.

The investigation followed allegations in the media that a number of honey products including Capilano's 'Allowrie' honey, labelled 'pure' and '100% honey' were adulterated with sugar syrup.

The allegations were based on results arising from a testing process known as nuclear magnetic resonance (NMR) testing. NMR testing can be used for a variety of applications, but has only recently emerged as a testing method for honey adulteration.

The ACCC is advised NMR testing is not yet reliable enough to determine whether honey is adulterated and therefore should not be used as a basis to support legal action. This is consistent with the approach of regulators in the UK, US and the EU.

The ACCC's investigation found Capilano had taken steps to provide assurance, and did not uncover any other evidence that supported the allegation Capilano's 'Allowrie' honey was adulterated with sugar syrup.


"During the course of our investigation, however, it also became evident that there is low confidence in the current test method (the C4 test) used to detect adulterated honey.

"Governments and research agencies around the world are investigating alternative testing methods, including NMR, but these are not yet developed to the point they can be used with sufficient confidence," said ACCC Deputy Chair Mick Keogh.

Since 2015, the Department of Agriculture has tested imported honey using the C4 test, which did not detect adulteration in 'Allowrie' honey or some supermarket private-label products.

"The ACCC understands that where there are different tests for honey products that produce different results, it can cause significant frustration among consumers and industry," Keogh said.

"We understand the Department of Agriculture, which is best placed to determine the most appropriate form of honey testing, is reviewing testing standards.

"It's important that consumers have confidence in the claims made about the foods they purchase, including honey. The ACCC urges the honey industry and the Department of Agriculture develop an agreed approach to testing, and implement more robust programs to provide greater assurance about the integrity of their products," Keogh said. 



The opportunities of on-demand meal kits

In-store meal kit purchases are booming and giving food manufacturers opportunities for increased sales.

When meal kit subscription services came on the scene a few years back, they stirred up a lot of buzz and consumers gave them a try — but ‘try’ was the operative word because retention rates were low. Although a subscription-based meal kit delivery service doesn’t appeal to a broad segment of the population, the meal kit concept does — and with increased availability of the kits at grocery stores, online and in restaurants, a greater number of consumers are using meal kits..


“The meal kit market has been quickly evolving to adapt to consumer interests and needs,” said Darren Seifer, NPD food industry analyst.


“What started off as nearly exclusively online and subscription-based, kits now offered in store and on-demand online have increased the availability of meal kits to a broader population, and home delivery meal kit services have changed to meet consumer demand for more flexibility.”

When fresh meal delivery kits first hit the market, they represented innovative new ways of bringing fresh foods to consumers with the convenience of home delivery. Adoption of meal kit delivery services is still slowly growing, especially in urban areas where a trip to the grocery store is more challenging, but not with those who need to make last-minute meal decisions, finds NPD’s recent report ‘What’s Next for Meal Kits?’.

By 4.30 pm on a typical day, most consumers haven’t decided on their dinner meal yet — and that’s where in-store kits have filled the need. NPD reports that 59% of recent meal kit users are giving in-store kits a try, and 57% of in-store meal kit purchases are made on impulse.

“Clearly meal kits are a meeting the consumer’s need for convenience, fresh, and as a meal solution, which bodes well for the future of meal kits,” said Seifer.

“For food and beverage marketers, it’s a matter of getting your products in the meal kit box; for retailers it may be partnering with a food company or meal kit service; and for foodservice operators it’s about allocating space and integrating kits into your grab-and-go offering. The point is that meal kits provide the opportunity to become a meal solutions provider.” 



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Meal kits

– a \$3 billion market in the US



It all started back in 2007, in Sweden. A meal kit delivery service could offer busy customers the chance to save a lot of time, have access to a wide variety of food choices, eat healthily, improve their cooking skills and limit the amount of food waste. The concept was successful and expanded into Germany, Austria, the Netherlands, Belgium, the United Kingdom, Asia, Australia and North America.

Now stores are offering meal kits as ‘products’ rather than as a service and demand is still increasing, albeit not at the same rate as initially.

Meal kits only reached the US a bit more than five years ago but they have already become a fast growing billion-dollar business there. Market research firm Packaged Facts has released a report, *Meal Kits: Trend and Opportunities in the U.S.*, 3rd Edition, which forecasts the industry will continue to expand and grow healthily through 2023.

Packaged Facts estimates the US meal kit market had sales of \$2.6 billion in 2017 and will grow almost 22% by the end of 2018 to reach \$3.1 billion. Growth is forecast to steadily decline from double-digit gains over the next few years to single-digit gains by 2023.

Packaged Facts anticipates that the market for subscription meal kit delivery services will mature rapidly as other methods of meal kit sales become available and even preferred, such as one-time online orders from a meal kit website or app, online orders from a grocery store website or app, and in-store sales. As a result, future growth in the market will require industry leaders to continue pivoting and adjusting their business models to retain current customers and reach new clientele. Long-term, Packaged Facts concludes that as more traditional stores offer meal kits as a product rather than as a service, the market will stabilise and become similar to other convenience grocery items that sell for a premium, such as pre-cut fresh produce that is ready to eat.

“The meal kit market is highly dynamic and prone to fluctuations, with the top meal kit providers falling in and out of favour since their introduction in the past few years,” said David Sprinkle, Research Director for Packaged Facts.

“Further complicating things, market expansion is expected to be much more reliant on alternative purchase venues than the traditional subscription delivery model due in part to the convenience and flexibility of online shopping.”

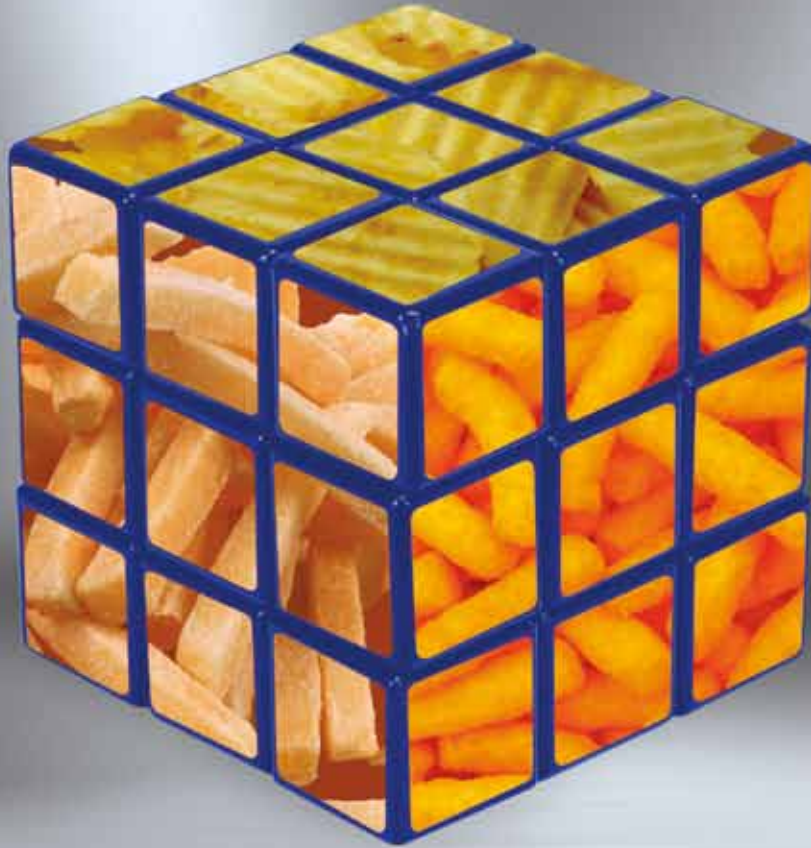
The advent of online grocery shopping has made customers more comfortable than ever with ordering fresh food online and has contributed to the expansion of the online market for meal kits. However, the problem for the traditional subscription model is that the ‘on-demand’ nature of online shopping through companies such as Amazon and the evolution of e-commerce over the past few years has led to consumers expecting convenience and near-instant gratification.

The subscriptions most meal kit delivery services provide often clash with the ‘on-demand’ mentality of potential meal kit customers, who want to be able to buy the products they want whenever they want. Subscriptions attempt to entice more purchases, and even when flexible, can lead to customers purchasing more than they want to buy at a given time to avoid increased fees. People who have felt these pressures are more likely to cancel their subscriptions, and many consumers never become customers because they do not like the idea of being ‘locked in’ by a subscription.

“It is unsurprising that many meal kit companies have been struggling to attract new customers and maintain existing ones under the subscription model. Paired with the retention problem is the struggle with attaining profitability due to the high costs of shipping fresh ingredients directly to consumers,” Sprinkle said. “These challenges demand that meal kit companies tweak their business models and find alternative ways to reach customers, as the potential market for meal kits as a product is much larger than the interest in meal kit delivery services as they currently exist.”

Meal Kits: Trend and Opportunities in the U.S., 3rd Edition forecasts market size and growth (2018–2023); examines new product availability; surveys retail channel trends including cross-channel shopping vs customer loyalty; and analyses trends and shifts in the needs of today’s meal kit shoppers.





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Say cheese

Blaine Friedlander*

A new way to give cheddar the right colour ditches waste.

Food scientists have found a waste-free way to give cheddar cheese its consumer-pleasing orange colour. The new method creates no waste when squeezing out the watery whey, while preserving whey's natural colour for other commercial uses, according to a paper in the journal *ACS Applied Materials and Interface*.

"Observing cheddar cheese in the grocers' dairy cases, you see different hues of orange and yellow, and they're all very popular with consumers," says Alireza Abbaspourrad, assistant professor of food chemistry and ingredient technology in the food science department at Cornell University.

The cheddar cheese's hint of tint comes from the South America-grown red annatto seed. Adding the seed's colour to milk during the cheese-making process turns the mixture orange or deep yellow.

Currently, when the curds form, cheese processors are left with an orange colour whey, the liquid part of milk, which is a valuable protein source. But as an additive to other foods, it's not commercially viable because of its colour.

"As whey drains, it still contains a lot of lactose, protein and minerals, which can be a valuable additive when it is spray dried. Food companies can use the powder to add to food products, like infant formula or weight-training drinks, for example," said Abbaspourrad. "But no-one wants to use orange colour whey."

Abbaspourrad's group has created an annatto-infused microcapsule — coated with a natural shell of casein and a

layer of fat — that when added to milk befriends the curd and leaves the liquid whey alone.


Inside the curd, microcapsules open during the cheese-ageing process. As curds mature, enzymes that naturally dissolve and release reddish annatto (bixin) to colour the curds degrade the fat layer. "There's nothing artificial, it's all natural, it's all green," said Abbaspourrad.

Assembling the microcapsules is a simple process. Imagine making a vinegar and olive oil salad dressing and then vigorously shaking it — by way of a homogeniser — into an emulsion. The emulsion is then coated with fat and casein protein, which naturally sticks to the surface of droplets and becomes a group of microcapsules.

This system is quite pliant, said Abbaspourrad: "The microcapsule shell's composition is controllable, tunable and it can be optimised to use with other enzymes in other food systems or other media."

Abbaspourrad and coauthor doctoral student Raheleh Ravanfar filed a provisional patent for the enzymatically triggered microcapsules as a novel method to selectively deliver colour to cheddar cheese and obtain white whey powder.

Original Study DOI: 10.1021/acsami.7b18795

*Blaine Friedlander is the Senior Science Editor, *Cornell Chronicle* and the article is licensed under CC Attribution 4.0 International license 

\$200,000 penalty for milking it

Former Murray Goulburn Co-operative Managing Director Gary Helou has been ordered to pay \$200,000 in penalties for being knowingly concerned in Murray Goulburn's false or misleading claims about the farmgate milk price it expected to pay dairy farmers during the 2015–16 milk season.

Murray Goulburn admitted to making false or misleading representations in breach of the Australian Consumer Law when it represented to farmers in Victoria, South Australia and southern New South Wales on 29 February 2016, and subsequently until 27 April 2016, that it could maintain its opening milk price of \$5.60 per kilogram of milk solids.

Helou has admitted he was involved in the misleading representations made by Murray Goulburn. This included not informing farmers of risks known to Murray Goulburn and making unfounded assumptions that Murray Goulburn could achieve its milk powder sachet sales targets.

"The penalty imposed against Mr Helou reflects his seniority at Murray Goulburn and involvement in misleading representations about the farmgate milk price," ACCC Deputy Chair Mick Keogh said.



"Murray Goulburn's misrepresentations meant farmers were not informed of the likelihood the final milk price would fall below the opening price. This was important information for farmers as it would have influenced the business decisions each farmer made," Keogh said.

"Farmers were denied the opportunity to plan for the impact of the reduced milk price on their businesses between February and April 2016, including implementing measures to reduce their exposure to a decrease in the milk price or shopping their milk around to other dairy processors."

The ACCC did not seek a penalty against Murray Goulburn because as it was a co-

operative, any penalty imposed against it could end up being paid by the very farmers that were misled.

"We were conscious not to seek penalty orders that would adversely affect farmers for the wrongs committed by Murray Goulburn, so we focused on obtaining appropriate orders against the individuals involved in the conduct," Keogh added.

As part of the resolution of the proceedings, Helou has undertaken to the Court that he will not be involved in the dairy industry for three years.

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Global dairy commodity update

Dustin Boughton

Global milk supply growth is steadily declining as weather continues to be the major supply-side wildcard affecting the outlook for global dairy markets into Q1 2019.

DAIRY FEATURE

The full effect of any European feed shortages on milk output and product mix choices won't be fully understood until early 2019. These prolonged dry conditions with lower milk solids will impact product availability and we may see a lift in dairy commodity prices.

Meanwhile, closer to home, excellent New Zealand conditions have weakened, with risks of further drying due to the arrival of an El Niño event later in the season. This could curb milk production in the Oceania region with milk intake already significantly impacted by drought and feed shortages in Australia as well.

The worsening US-China trade dispute is of course a hot topic in the dairy world and is affecting confidence and purchasing power across the Asian region. These trade wars threaten to undermine slow growth in commodity trade with weaker demand likely for China and South East Asia into 2019.

Whole milk powder

Whole milk powder values are trending weaker with NZ availability expected to grow 3–5% in NZ peak milk supply. Competition from LATAM suppliers taking advantage of weaker currencies may weaken prices further. However, an expected El Niño event could dampen post-peak milk growth in NZ, which may significantly impact whole milk powder values.

Skim milk powder

Skim milk powder values are projected to gradually improve in the EU as skim milk

powder/butter valorisation is competitive against cheese in the EU. Skim milk powder has continued its steady incline as EU intervention stocks are starting to sell through. Consequently, we may see prices start to firm.

Butter

The butter market is starting to free up a little in Oceania, in particular, NZ origin product which is based on good spring milk volumes. Australia on the other hand is well down on milk flow and hence fat is still tight. Continued growth in Chinese demand for fat-related dairy products may see a floor come into this market and stabilise prices at these levels.

Cheese

In Oceania, low fat values are expected to affect cheese prices. Furthermore, drought conditions in Victoria will hamper milk flow and could consequently put pressure on the supply of Australian specific cheddar. Across the globe the slowly improving turnover in US cheese stocks as a result of improved foodservice and retail demand could see prices firm.

Whey

We've seen whey prices starting to level off after a few months of solid pricing. Due to the loss of Chinese demand and higher cheese output, US whey prices have drastically weakened, bringing the market back into balance.



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Natural extract flavouring System

In response to the demand for healthier and indulgent products, Sensient Technologies has created a collection of rich dairy flavours. The flavours also enhance the mouthfeel of products, providing the indulgence factor that consumers like.

The DairyBoost range of natural extract flavouring systems delivers the rich mouthfeel and authentic characteristics associated with full-fat dairy products. These natural flavourings are cost-effective, enabling food technologists the flexibility to easily create healthier products without compromising on taste.

The DairyBoost Plus range of natural butter, milk and cream flavours enhances dairy products by elevating the mouthfeel and enriching the flavour. It is made using fresh NZ milk.

DairyBoost Plus was developed to meet the expectations of today's consumers. It is locally manufactured in Australasia, can be labelled as natural flavour and requirements such as natural, halal, liquid and powder can all be catered for.

Sensient Technologies

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New \$660 million value-added fresh poultry facility

“The largest single-site investment ever made in the Canadian food sector” and “the single most technologically advanced facility of its kind in the world” are claims about the new poultry processing plant that Maple Leaf Foods is building in London, Ontario.

Maple Leaf Foods was Canada’s fourth-biggest food processor by revenue last year. The packaged meat company is headed by Michael McCain, who is one of the children of the founder of McCain Foods — so the food industry really runs in his blood. Headquartered in Mississauga, Ontario, Maple Leaf employs around 11,500 people and does business in Canada, the US and Asia.

With chicken being the most consumed and fastest growing meat protein in Canada, and demand high for chicken raised without antibiotics and halal chicken products, the future for Maple Leaf’s chicken business is looking firm. However, McCain told the *Financial Post*: “The supply chain we have today in our poultry business, which is endemic across the entire supply chain in Canada, I think, is sub-scale and inefficient. It’s 50 to 60 years old, or more in some cases, and does not deploy the latest technologies. We know that while it’s a profitable category for us today, it’s not long-term secure.” Hence the new \$660-million fresh-poultry facility.

The 60,000 m² facility is expected to be one of the most technologically advanced poultry-processing plants in the world, with leading-edge food safety, environmental and animal welfare processes and technologies.

Construction at the London site is expected to begin in the Northern-Hemisphere spring of 2019, with start-up planned to commence in the second quarter of 2021. The new plant

will initially support over 1450 direct full- and part-time jobs, with additional job growth as production volumes increase over time.

Construction is expected to generate approximately 300 jobs, with almost 85% of project expenditures supporting domestic construction and installation contractors. The facility is expected to create a further 1400 indirect jobs in the supplies and services sector and generate an estimated \$1.2 billion of annual economic activity once it is fully operational.

Production from the company’s three sub-scale and ageing plants in Ontario will eventually be consolidated into the new facility. The company’s plant in St. Marys is expected to close by late 2021, while its plants in Toronto and Brampton are expected to close by mid-late 2022. Each of these plants is 50 to 60 years old, with location, footprint and infrastructure constraints that limit opportunities to expand and modernise to meet growing market demand.

Maple Leaf will invest an initial \$605.5 million into the plant, while \$34.5 million will come from the Ontario government and an additional \$28 million from the Canadian government. As part of the federal funding agreement, Maple Leaf will invest a further \$5 million over the next five years on projects that accelerate adoption of advanced manufacturing and production technologies and support the company’s goal to reduce its environmental footprint by 50% by 2025.

The project is expected to deliver annualised benefits of \$105 million to the company’s Adjusted EBITDA on a run-rate basis within 12 months of completing start-up, and by the end of 2023. The project is expected to be accretive to earnings beginning in 2022 and contribute to the company achieving its Adjusted EBITDA margin target of 14–16%.



How CCA will cut its energy bill by \$1.3 million

Coca-Cola Amatil is to install 10,000 commercial solar panels across three of its bottling operations in the next 8–10 months. The 3.5-megawatt rooftop solar PV system will help to cut CCA's annual energy costs by up to \$1.3million.

Energy services company Verdia will manage the solar panel rollout across three sites in three different states. After installation it is anticipated that CCA will be drawing around 14% less energy from the local electricity grid across these three sites, which equates to a reduction of 4163 tons of greenhouse gas each year.

"On current figures the installation will pay for itself in six to seven years and is expected to provide an additional \$14 million benefit over its lifetime," said Peter West,



CCA Managing Director for Australian Beverages.

"We're also committed to obtaining at least 60% of our energy needs from renewable and low-carbon sources, by 2020.

"So, this installation is a win-win for us, and congratulations to the team at Verdia for helping make it a reality.

"Verdia completed site inspections, electrical connection investigations, engineering designs and financial modelling as part of the scoping work for the project.

It will then manage more than 50 contractors and suppliers working across New South Wales, Queensland and Western Australia to fast track the project delivery. Verdia will continue to monitor and maintain the systems.

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The truth behind machine vision misconceptions

Harel Boren, CEO of Inspekto

The floppy disk was once the cutting edge of storage, its design slowly decreasing in size as technology progressed. But technological advances were to reshape the future of storage with a new approach that broke a variety of misconceptions about data storage.

The introduction of the USB drive led to the eventual decline of the floppy disk, which is now banished to the history books of storage. As the machine vision industry goes on to embrace autonomous machine vision, misconceptions remain.

Cost limits what's possible

Installing a machine vision solution is viewed as an expensive process. This is because traditional machine vision solutions require a major effort and continuous investment on top of upfront costs. Installing and maintaining a traditional solution is a complex process that requires expertise. The combined cost of these professional services with cameras, lenses, lighting and more, turns traditional solutions into an expensive business — in the region of £0,000 to £50,000 or more, per inspection point.

Because these solutions are tailored to a particular point in the production line, they are also inflexible, made to work for only one product at one point on one production line. This means adding additional quality assurance points to the line can cause costs to spiral.

None of this is true with autonomous machine vision, where a system is standalone, simple and quick to set up, making it affordable. In fact, an autonomous machine vision system should typically be installed at 1/10th of the cost and at up to 1000 times the speed of planning and installing a traditional solution. Thanks to speed and affordability, it can be installed at any stage of the production line and moved to a new location in minutes when required.

A systems integrator is essential

Because traditional machine vision is a complex process, there is a misconception that the industry will always rely on the expertise of a systems integrator. The machine vision ecosystem has for many years aligned itself to the systems


integrator, the only party equipped with the expertise needed to build a solution. Once the solution is installed, a systems integrator is required for every set up and changeover on the production line.

In the age of autonomous machine vision, systems integrators are no longer required. The manufacturer can install a visual quality assurance (QA) system out of the box in minutes. Because autonomous machine vision systems can self-set and self-adjust, the manufacturer is able to do this independently at any point on the production line. Just like the floppy disk, the systems integrator becomes obsolete.

Machine vision will never be plug and play

Since the 1980s, manufacturers have used machine vision technology for quality assurance. The process has always involved building a tailored solution, piecing together the right filters, lenses, lighting and cameras. Over weeks or even months, the integrator must continue setting proof of concepts (POC), testing plans, programming and more — leaving plug and play visual QA as a far-fetched dream. As written by Fred Grootentraast from ICT Group in a 2016 article titled 'Machine vision is not plug and play', "The success of machine vision is dependent on the use of the right hardware and software and this requires specialised knowledge of both disciplines."

Though this was once true, autonomous machine vision now brings the capability to simply plug and inspect. New technology, such as Inspekto's S70 system, means that in 30 minutes, any member of staff could install a system and start performing effective visual QA.

Just as the next step in storage was not a smaller floppy disk but an entirely new approach, autonomous machine vision is a new era in visual QA. 

Inspekto

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Measuring risks to supply chain disruptions

Companies may be able to determine their vulnerability to major supply chain disruptions thanks to a new analytic measure developed by A*STAR researchers.

Disruptions in supply chain networks can have immediate effects downstream in the network, as well as knock-on effects on other businesses dependent on the network for survival. The consequences can be severe, causing widespread economic fallout — especially for those who are unprepared.

Rick Goh and his team at A*STAR's Institute of High Performance Computing aimed to measure supply chain risk that takes into account the loss profile of the originating node, the structure of the supply network and the resilience of the network components.

They developed an analytical measure by tracking the propagation of a production pause through a network of nodes using generalised mathematical models of both perfect tree and randomly constructed networks. The measure has the potential to improve decision-making in supplier management and lower financial risk.

“When a man-made or natural disaster or disruption is happening somewhere, a company may not capture the impact to its production line as the disruption may apply to its second- or third-tier suppliers directly, rather than to its first-tier partner,” said Goh. “We wanted to capture the propagation of supply chain disruption risks far beyond their immediate connection to a focal company, which may reach to the company later on but they usually realise that it is too late when it comes to them due to the loss of time across the supply chain network.”

A*STAR stated a better understanding of how disruption-caused losses spread through a company's supply chain network could help



companies improve their supplier network structure, but it is difficult to do and is rarely subjected to quantitative analysis. Goh and his team wanted to develop a more reliable measure that can capture the key factors contributing to sensitivity or resilience to disruption across a multi-tier supply chain network.

“Beyond only looking at the propagation effects from one company to another, in our study, we also consider individual companies' resilience capability to overcome the disruption risks and manage the situation internally,” said Goh.

The researchers showed that mapping out and understanding risk factors is essential to risk minimisation, and highlighted the need for supply chain managers to build risk profiles of each component of a supply chain network.

“The modelling confirms that having multiple redundant suppliers, both direct and indirect, will help cushion, or even remove, any impact on one's own production, and may help prevent chained domino-effect disruptions,” concluded Jesus Felix Bayta Valenzuela, first author of the study.

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Pilot projects have been carried out in the Americas and in Europe. The company claims an Americas-based dairy producer reduced operational costs by more than 10% in the first year of implementation, and the project continues to deliver further savings.

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All relevant food safety standards and compliance codes are referred to throughout the process, ensuring elements such as high-care rooms, drainage, flooring and factory ventilation are accurately designed and correctly installed.

RMR uses a competitive tender process to select the most suitable builders and gain competitive pricing, high quality and high safety standards.

RMR also specialises in process design for fresh and shelf-stable food products. The team can design, procure, install and validate processes ready for safe, commercial operation. RMR provides its clients with an automation strategy that minimises initial investment and allows for scaling up as required, with 'factory smarts' to take the facility safely into the future.

RMR Process Pty Ltd

www.rmrprocess.com



Receiving/transfer automation application module

Sterling Systems & Controls has announced its automation application module for receiving and material transfer for dry solids. All automation systems are custom engineered and manufactured to meet customer requirements. The company routinely incorporates its Receiving/Transfer application module in automation systems within a variety of industries.

The application is custom designed, which includes allowing for manual control or to include the ability for automatic receiving and transfer steps within the user's facility. A fully automatic application accurately tracks and transfers incoming material to the correct location, such as grain and other commodity materials in a feed manufacturing facility.

The application is custom designed, which includes allowing for manual control or to include the ability for automatic receiving and transfer steps within the user's facility. A fully automatic application accurately tracks and transfers incoming material to the correct location, such as grain and other commodity materials in a feed manufacturing facility.

Truck or railcar transport can be accommodated. Feed rates are controlled to maximise efficiency and safety. After the material has been moved into the containment location (bin etc) the system logs and weighs empty trucks before they leave the facility. Weight measurements, before and after material transfer, are logged into the tracking function, maintaining accuracy and traceability.

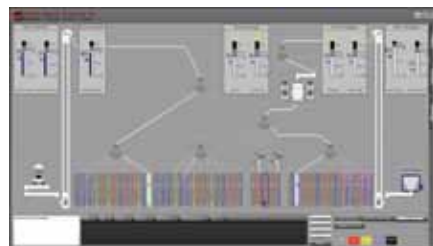
More efficient receiving and transfer of incoming materials means higher throughput, more production and lower labour costs.

Records and information are stored in a database by vendor, truck/rail company, etc, allowing users to provide custom reports.

Traceability, IoT tracking and batch validation are enhanced.

Sterling Systems and Controls Inc

www.sterlingcontrols.com



Antimicrobial floor for brewery

In Bright in Victoria, there is the aptly named Bright Brewery, which has been brewing ales with local hops and fresh mountain water since 2005. Part of the craft brewery boom sweeping Australia, the brewery and bar began operations in two small tin sheds. In 2012 the brewery gained a new and much-expanded look with 24 taps, multiple seating areas and a view into the brewery.

Bright Brewery uses fresh mountain water, quality ingredients, craft brewing techniques and sustainable practices to brew its signature beers. All beers are brewed on site, including small batches of seasonal, experimental beers.

Past the usual ambers, pales, porters and witbiers, beer enthusiasts can lock lips with a Pumpkin Harvest Ale (brewed with Styrian pumpkins grown by in nearby Ovens) or a Wandu Nut Brown Ale (made with walnuts from The Artisan Mill in Ovens).

Recently, Bright Brewery constructed a brand new, purpose designed and built brewing facility, with excellent consideration given to drain placement and location of the mezzanine platform, to ensure efficient production.

As part of the project, a total 1500 m² of the hygienic and antimicrobial cementitious polyurethane range Flowfresh from Flowcrete has been installed.

600 m² of the slip-resistant Flowfresh SR was installed in varying thicknesses across the heavy-duty areas of the brewery in Warm Buff. These areas required a robust system that would handle both acids and cleaning chemicals and the thermal changes associated with fermentation and strict hygiene controls.

A further 900 m² of Flowfresh Sealer was applied in the light-duty walkways and passageways in Tile Red, which would stand up to frequent foot traffic all while providing a hygienic platform underfoot.



Flowfresh is a line of HACCP International-certified, antimicrobial-treated cementitious urethane flooring designed predominantly for the food and beverage industry.

Containing a silver-ion based antimicrobial additive, Polygiene, Flowfresh systems complement floor cleaning and hygiene practices between wash cycles by protecting the surface from degradation caused by microbial growth.

The permanence of Flowfresh's bacteria killing property was put to the test when it was analysed according to the ISO 22196 standard, which measures the efficacy of antibacterial-treated surfaces. As part of this test, samples of Flowfresh were hot washed and abraded multiple times, over and above the ISO 22196 requirements.

This intensive abuse was undertaken to recreate the reality of what a floor in a food plant would be subjected to and Flowfresh apparently "more than proved that it was able to survive such conditions and maintain its superior hygiene credentials".

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Small bevel gear units

NORD DRIVESYSTEMS has launched the SK 9x0072.1 series of NORDBLOC.1 bevel gear units that are washdown-optimised for hygienic applications. The series offers smaller gear units for torques up to 50 Nm as an efficient alternative to worm gear units.

The series has a power range from 0.12 to 1.1 kW and covers speed ratios from 3.03 to 47.67:1.

The two-stage helical bevel gear units are characterised by high efficiencies, compact design and long working life. The aluminium housing offers high rigidity and durability with low weight.

The modular design provides wide application flexibility due to numerous application and mounting options. There are two models available: SK 920072.1 and SK 930072.1. The open housing of SK 920072.1 is lightweight and solid. It is also available with a universal foot flange.

With its closed housing, the SK 930072.1 is suited to applications with stringent requirements for hygiene and cleanliness. Additional protection is provided by the optionally available nsd tupH surface treatment.

The standard version is equipped with a B14 flange. All versions are available with solid or hollow shafts. The motor can be mounted directly without a coupling or adapter (IEC or NEMA).

Accessories including torque arms, flanges, covers and fastening elements from the Universal series may also be used. The compact and flexible bevel gear units are suitable for intralogistics and packaging technology and, due to their washdown design, may also be suited to the food and beverage industry.

NORD Drivesystems (Aust) Pty Ltd

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Quick shipment of flexible screw conveyors

Flexible screw conveyors in popular sizes are available for shipment in two to five days as ready-to-assemble packages with Flexicon's Quick-Ship Programme.

Conveyor tubes and screws offered through the programme are supplied in any length from 3 to 12 m, in diameters from 67 to 115 mm OD.

Also included as standard are a stainless steel floor hopper, 45° or 90° discharge adapter, TEFC or washdown duty motor and water-resistant control panel.

All product contact surfaces are stainless steel with the exception of the polymer conveyor tube. Non-product contact surfaces are of carbon steel construction with durable industrial finish.

Stainless steel screws are supplied in a range of geometries matched to the material being conveyed. Options include a hopper flow promotion device, hopper cover with unflanged inlet port, hopper screen and low-level sensor.

The conveyors can transport a range of bulk materials from large pellets to sub-micron powders, including friable products, abrasives and materials prone to pack, cake, bind or smear, with no separation of blends. Depending on screw geometry selected, material can be conveyed at any angle from horizontal to vertical, in a straight or curved path, through small holes in walls or ceilings.

The screw is driven beyond the point at which material exits the discharge housing, preventing material contact with seals and related issues of bearing failure and product contamination.

The inner screw can be removed through a lower end cap for washdown and inspection, and the conveyor tube flushed with water, steam or cleaning solution.

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ALC to install an automated meat buffer system

The Australian Lamb Company (ALC) plans to improve efficiency and accuracy at its Colac-based meat processing facility by installing a meat buffer storage and handling solution.

ALC produces, supplies and exports lamb products to hotels, resorts, restaurants, butchers and supermarket chains worldwide.

According to Dematic, many Australian meat processors have invested in automating meat processing, but distribution and despatch processes are still largely labour-intensive and inefficient.

The company's Automated Multishuttle Chilled and Frozen Storage and Retrieval System (ASRS) will help the meat processing facility address these issues and achieve better visibility of product flow and accuracy. It features automated overheight detection to prevent cartons entering the system that are out of specification, and an electronic interface to ALC's host system for streamlined data exchange.

"One of the main challenges for ALC with their existing system was that the process of building, sorting, storing and retrieving SKU pallets was a very time consuming and manual process performed by staff," said Soeren Schauki, Business Development Manager at Dematic. "Dematic's Multishuttle ASRS solution will automate and simplify this buffer and sortation process by automatically buffering, sorting, storing and retrieving them as pallet lots."

Other key benefits include: increased speed and reduced complexity to build SKU pallets; reduced manual handling;



reduced product damage; improved overall productivity; and avoiding the need for staff to operate in a freezer environment.

Dale Smith, Chief Financial Officer and Director at ALC, said: "Multishuttle ASRS is the fastest, most flexible compact solution that is able to buffer and deliver fully sequenced meat cartons to further automation. And with a simple and proven electronic interface with our host system, Dematic's solution met our operational requirements for the meat processing facility."

The implementation is expected to be completed by March 2019.

Dematic Pty Ltd

www.dematic.com.au



Vibratory cross feeder

Greater production demands within the packaging industry has led to the efficiency of the multi head weigher increasing. Due to this as well as the demand to handle a wider range of product types, the

flow of product to the weigh head is critical. A greater emphasis is also being placed on the hygienic aspect of equipment coupled with reliability and ease of maintenance.

Enmin's Vibratory Cross Feeder bridges the gap. Vibratory equipment within the food and allied industries is recognised as a desirable approach to convey and meter products. The cross feeder employs standard Enmin LD electromagnetic vibratory drives to convey product and accurately control feed rates.

As the LD electromagnetic drives are electronically controlled, a variety of controllers are available to ensure flexibility and the ability to achieve the optimal conveying output required.

Hygiene, minimal maintenance and reliability are high on the list for food processors, with hygiene naturally critical when processing food products. The vibratory cross feeder delivers in all three of these areas.

Investment costs are also ever present so the company ensures a close working relationship through the design, approval, manufacturing and installation process in order to guarantee the correct solution is delivered.

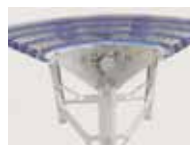
The company ensures its equipment is able to be easily integrated into any production line without operational glitches.

Enmin Pty Ltd

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Brewery installs picking system and keg gripper

Olvi Brewery has ordered a new robotic dolly picking system and modified solution for keg handling for its headquarters in Iisalmi, Finland, from Cimcorp, a manufacturer and integrator of turnkey robotic gantry-based order fulfilment and tyre-handling solutions.

Founded in 1878, Olvi is the only independent Finnish brewery to have survived in the 19th century, and the updates form part of its strategy to remain agile and keep up with changes in the industry. The brewery distributes beers, ciders, soft drinks, energy drinks and bottled water directly to retailers all over Finland.

The Cimcorp solution includes gantry robots for handling the dolly picking as well as software, which controls the material flow after production, from the high-bay warehouse to the loading docks for order fulfilment.

The company modified Olvi's previous order picking solution from 2014 to handle kegs, which Olvi's Customer Service and Administration Director Marjatta Rissanen said they had struggled with for years. It is designed to store pressurised beverages like beer, cider or long drinks, in addition to beverage trays. Cimcorp also provided the software modifications needed for controlling the keg gripper.

"30-litre kegs are hard to handle because of their size and weight. Previously, kegs were picked manually and added to customer-specific pallets. During the summer season, the amount of kegs picked each day increases dramatically due to heightened demand. The new keg gripper will not only help optimise handling during peak times of the year, but also make



it safer for our employees and get products to our customers faster," Rissanen said.

The partnership between the two companies began in 2005, when the brewery first invested in its initial automated order picking system. Rissanen said they built on this partnership to develop the keg gripper. "Suddenly our Technical Manager realised that Cimcorp has a gripper that handles tyres. Tyres are heavy and round, just like our kegs," she explained. "It seemed like a natural fit."

The modified keg gripper was customised in spring 2018, ready for the summer peak season. Pekka Kääriäinen, Technical Manager at Olvi, said, "Despite the tight schedule, the implementation was excellent. The equipment has worked well from the beginning."

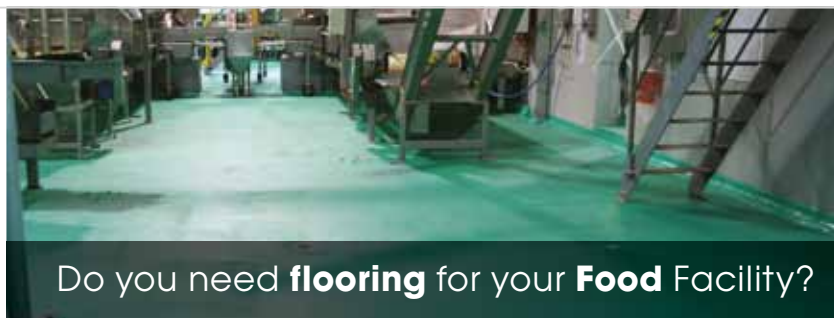
Cimcorp's Vice President of Sales Kai Tuomisaari said the company and Olvi have mutual trust. "We like to think that we are more like partners rather than having a conventional customer-supplier relationship."

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Rugged large displays

London Electronics' range of general-purpose large displays have a simple yet rugged design that gives long-term reliability and a smart appearance. Calibration and commissioning is made easy with the intuitive menu-free programming system.

A simple way to see and share important measurements over distances up to 50 m.

The displays can help the user's workforce keep in touch with what is happening. They are suitable for displaying important plant variables such as: production rate; production total and target; temperature and humidity in controlled environments; crane lifting weight; synchronised factory clocks; weighbridge load; and any physical variable important to the user's process.

All the signal conditioning, power supply and display circuitry is included in the enclosure, so installation is simple and tidy. Just apply power and connect the input signal to get precise display of process variables.

Users can wall-mount or suspend the displays, and AMS can supply free mounting brackets.

AMS Instrumentation & Calibration Pty Ltd

www.ams-ic.com.au

Liquid pressure pipeline magnetic separator

The Magnattack RE80 HT Liquid Pressure Pipeline Separator (PPS) is engineered to efficiently extract

magnetic fragments (including work-hardened stainless-steel and magnetic stone) from food lines such as soups, chocolate, sauces, dairy products and other liquid products.

The system features a single or double set of powerful RE80 HT +11,000 gauss magnet elements, which intercept the flow of product and securely retain foreign metal contaminants.

The PPS was designed following customer feedback relating to difficulty in handling bulk liquid magnet systems and the time taken to clean multiple finger pot magnets/liquid trap magnets. After a period of R&D and testing, the Liquid Pressure Pipeline Magnet was found to be a more hygienic and efficient magnetic separation system. The system can be used in places where conventional liquid trap magnets are unsuitable.

The magnet elements are easily removed for cleaning. The Liquid Pressure Pipeline Magnet can be used for both protection of critical processing equipment and final product security.

Magnattack Global

www.magnattackglobal.com



Data logger for process monitoring and optimisation

DataTaker data loggers can be used to monitor food manufacturing processes and the storage of products.

The dataTaker DT80 is cost-effective data logger expandable to 100 channels. Users have remote access to logged data, configuration and diagnostics via WAN or LAN connections. Modbus slave and master functionality allows connection to Modbus sensors and devices and to SCADA systems.

It has smart input channels capable of interfacing to digital and analog sensors, and its rugged design and optional custom enclosure is designed to provide reliable operation under extreme conditions.

The DT80 includes USB memory stick support for easy data and program transfer.

Higher productivity can be achieved by, for example, allowing data collected by the dataTaker DT80 to feed into a programmable logic controller that can drive the valve sequencing for the machinery or effective sterilisation of food ensured by using the data logger to monitor temperature and humidity.

Thermo Fisher Scientific

www.thermofisher.com.au



Virtual beverage lab

Formulating beverages that become consumer favourites begins at INSIDE IDEA LABS, where Ingredion's food scientists have the expertise and experience to solve challenges in every stage of product development.

INSIDE IDEA LABS' virtual beverage lab provides users with ready-to-use formulations; troubleshooting tips and how-to videos; white papers and research; and concepts and ideas that point the way to emerging trends and techniques in creating new beverages. Users can request an ingredient sample to get started straightaway too.

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Air Liquide continually improves and invents new applications and equipment for the food industry to tackle emerging challenges in food safety and quality.

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03 Flexible Supply Modes

From cylinders to cryogenic vessel supply, Air Liquide can provide you with the best solution tailored to your needs and production capacity.



Technology developed to reduce sugar in juice

Although fruit juices contain important vitamins and minerals, they can be loaded with sugar. An enzymatic technology developed by Better Juice may be able to reduce the amount of simple sugars in juice by turning them into fibres.

Whole fruits contain fibre, which helps the body to absorb sugar slowly and keep you full for longer. A single serving of some juices, such as apple or orange juice, can contain up to 25 g of sugar, and traditional juicing methods can reduce the amount of natural dietary fibre. This means the sugar content is quickly absorbed in the body and can contribute towards health issues such as tooth decay and obesity.

Better Juice, in collaboration with Hebrew University in Israel, developed a technology that harnesses a natural enzymatic activity in non-GMO microorganisms to convert a portion of the simple fructose, glucose and sucrose sugars into fibres and other non-digestible natural sugars.

"This natural, non-fermentative process occurs without adding or removing ingredients," said Eran Blachinsky, PhD, Founder and CEO of Better Juice. "It also will not alter the flavour or aroma of the juice."

However, Blachinsky explained that the process reduces the sweetness of the juice slightly and results in more of the fruit flavour.

The process involves one short and simple pass-through step in the juice-making process and works on all types of sugars, according to the company.

After conducting several trials with different beverage companies, Better Juice managed to reduce sugars in orange juice from 30% up to 80%. The company can now provide proof of concept for orange juice. The process is patent-pending, and Better Juice hopes to market the technology to fruit juice producers, cafes and restaurants.

Ishida designer awarded for multihead weigher

Toshiharu Kageyama, a mechanical engineer with Ishida Research and Development in Japan, invented an oval-shaped, 18-head multihead weigher that has resulted in him winning the 62nd Kyoto Inventors Award.

"I am honoured to receive this historical award; it is a great pleasure that the product created from my ideas are satisfying customer's needs throughout the world," he said.

Ishida said it was imperative to develop a new multihead weigher capable of high-speed weighing while maintaining high accuracy. High-speed vertical form fill seal (VFFS) packaging machines grew in demand around 10 years ago in response to the industry's need for improved productivity. For high-speed accurate weighing to effectively support high-speed bagmaking, product had to be evenly and consistently fed to all weigh hoppers. If product feeding to each hopper was inadequate, high-speed bagmaking became impossible because of a lack of available combination heads.

Kageyama devised a method to rotate the approach route of product to hoppers using vibration, allowing product feeding to areas that were difficult to feed. Ishida developed its Back to Back feeder that distributes products equally to two weighing inlet chutes from a single supply conveyor, as well as the oval-shaped multihead weigher that allows an optimum discharge route to twin VFFS packaging machines. These three elements enable high-speed weighing of up to 280 weighments per minute, and the company said this technology helps provide footprint and cost savings as one oval-shaped weigher does the job of two weighers.

These technologies are patented in Japan, and more than 350 units are installed in packaging lines for snacks, biscuits and vegetables factories worldwide.

Kageyama also helped develop the Atlas VFFS bagmaker and is now involved in developing the next-generation Ishida multihead weigher. Technology for a new weigher solution includes utilisation of artificial intelligence (AI) and will lead to accurate feeding control, further reduction in product give-away and improved production efficiency.



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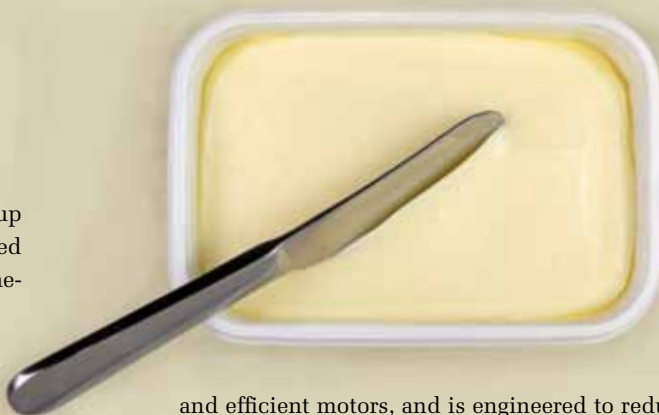
China's first carbon dioxide margarine production line is up and running. Yihai Kerry Group and SPX Flow have combined forces to deliver an energy-efficient, eco-friendly, state-of-the-art margarine process line in China.

The new processing line for Kerry Oils & Grains (Tianjin) employs SPX Flow Nexus scraped surface heat exchanger (SSHE) technology, which uses carbon dioxide as the refrigerant.

The crystallisation process is critical to the quality of margarine. Heat exchangers are used to cool the margarine to form crystals which influence the final characteristics of the product. Traditionally, these heat exchangers have used cooling media such as ammonia or Freon.

There are many advantages in using carbon dioxide instead of Freon or ammonia. It is naturally occurring, less expensive and has no specific safety restrictions or regulations associated with its use, ensuring a healthier production environment for employees. It is also more efficient at cooling the margarine and so uses less energy, which, in turn, reduces the carbon footprint of the process. Faster cooling of the margarine further creates smaller, more plentiful crystals, which enhances the quality with improved texture and smoother mouthfeel.

The new production line, launched in October 2017, is an expansion to an existing line at the Yihai Kerry Group Tianjin facility, installed 10 years previously. While the chilling process is at the heart of the line with a high-pressure plunger pump, Nexus SSHE, pin rotor machine and resting tube, the line includes all processes from pre-mixing to final product. Its advanced, customised design incorporates high heat recovery



and efficient motors, and is engineered to reduce overall energy consumption.

An additional advantage of the Nexus SSHE is its flexibility. The technology is designed to adapt to specific plant and process requirements using individually operated chilling tubes, which enable easy variation of chilling and scraping intensities to produce various final product characteristics. A production pressure up to 120 bar further ensures individual customer requirements are met in terms of properties, such as malleability and plasticity.

The new line at Tianjin efficiently integrates the production of shortening, margarine and pastry oil with automatic control of processes. What's more, the faster cooling capability of the SSHE means higher production capacities. The line can achieve 15 tons/h for shortening, 5 tons/h for margarine and 3 tons/h for pastry margarine.

The new, eco-friendly processing line at Tianjin is a breakthrough for the margarine manufacturing sector in China in terms of efficiency, reducing carbon emissions, flexibility and quality.

SPX Flow Inc

www.spxflow.com/au

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Food-grade panel PC

Interworld Electronics has released the FABS-921AP food-grade stainless steel panel computer.

The FABS-921AP is housed in a fanless aluminium enclosure with a 304 or optional 316 grade stainless steel bezel that provides IP66/IP69K front panel protection. Part of the FABS series, the panel PC has been optimised to meet the hygienic design requirements of DIN EN 1672-2 and DIN 42115, Part 2. These European standards establish high standards for food and beverage processing equipment.

The FABS-921AP is powered by an Intel 6th/7th generation Core I Processor with DDR4 memory. A full HD 21.5" 1920x1080 resolution LCD and 7H anti-scratch durable projected capacitive touch screen make it suitable for operator panel and HMI control applications. The standard 250 cd/m² or an optional 1000 cd/m² high brightness screen is available.

It provides: 2 x COM, 2 x GbE LAN ports, 2 x USB3.0 ports as well as support for internal Mini-PCIe expansion modules. Communication and network options include 3G/4G, Wi-Fi/BT, GPS and RFID. The

internal 2.5" SATA3 HDD is easy to access allowing the operating system and data storage to be upgraded at any time.

The FABS-921AP supports DC 9~36 V power input and an operating temperature range of 0~50°C. Operating system support includes Windows 10/IoT. The panel computer is 60 mm deep. Panel and VESA mounting make the FAB series convenient to install.

Interworld Electronics and Computer Industries

www.ieci.com.au

No drip external mix atomising spray nozzles

EXAIR's 1/8 NPT No Drip External Mix Atomizing Spray Nozzles mix liquid and air outside the nozzle and allow the air and liquid flows to be adjusted independently.

The nozzles prevent post spray drips wasting precious resources such as expensive coatings, chemicals or water. They are suitable where no post-spray drip is permissible. When the compressed air supply is shut off, the no drip nozzle positively seals off the flow of liquid eliminating the possibility of drips.

The nozzles are available in three different liquid patterns: pound, narrow angle flat fan and wide angle flat fan. They are available with 1/8, 1/4 and 1/2 NPT inlets with a variety of liquid flow values to suit the user's application. They are for pressure-fed applications where precise liquid flow is needed. External mix nozzles can be used on liquids with a viscosity above 300 cp.

Applications include painting, coating, rinsing, cooling, quenching, wetting (moistening), dust control and humidification. The compact atomising nozzles are fully adjustable to minimise air and liquid consumption and have interchangeable liquid and air caps. They are CE compliant and conflict mineral-free.

Compressed Air Australia Pty Ltd

www.caasafety.com.au



Small flat nozzle for machines with limited space

Available from Spray Nozzle Engineering, the SILVENT 941 is a small flat nozzle. This nozzle generates a wide, thin air stream with a blowing force of 3.4 N, making air savings of 40% and a noise reduction of 17 dB(A).

Made of stainless steel, the SILVENT 941 tolerates high ambient temperatures, mechanical abrasion, aggressive and corrosion prone atmosphere as well as requirements for cleanliness.

Due to its small dimensions, the nozzle is suitable for machine designs with limited space and is also commonly used in small, silent and efficient custom-made air knives.

The Silvent technology makes it possible to combine efficient and silent blowing. SILVENT 941 fulfils the noise requirements of the EU Machine Directive as well as the OSHA safety regulations.

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www.weidmuller.com.au

Magneto-inductive displacement sensors

Bestech Australia has announced the industry-standard version of its magneto-inductive sensors, MDS45. Combining features of both inductive and magnetic sensors, these sensors provide linear output signal with high temperature stability. The sensors are capable of measuring displacement between 20 and 50 mm. The ranges can be easily adjusted by changing the magnet.

MDS45 sensors have their own robust M12/M18/M30 stainless steel housings with IP69K protection, which makes them suitable for displacement measurement in demanding environments, such as in the food industry. The MDS45 is also available in a flat plastic housing option with compact and flat design for measurement in a restricted area. As the sensors and the magnet can be installed separately, measurements through objects and non-ferromagnetic materials are possible.

The MDS45 is also suitable for dynamic applications with a fast measuring rate of maximum of 3 kHz. It is designed with high-temperature and pressure-resistant materials for measurement in harsh environments. One example of a relevant application is accurately measuring the dosage when filling drink cartons in the factory. The sensor is capable of measuring the valve lift of the filling line which translates to the dosage transferred.

The sensor also provides analog outputs in 4–20 mA or 2–10 V which can be interfaced with an industrial data acquisition system with minimum signal conditioning.

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Safety knife

The SECUNORM 500 safety knife is a universal cutting tool. Following in the footsteps

of its predecessor the SECUNORM PROFI, the safety knife sets standards in ergonomics, safety and design and the automatic blade retraction increases protection from cutting injuries.

It is suitable for cutting all common cutting materials, from plastic strapping bands, film, bagged goods through to textiles and 3-ply cardboard.

The shape of the silver aluminium handle improves handling even during the most demanding and frequent cutting tasks. The soft-grip slider allows for easier operation, plus the slider can be operated from either side making it suitable for right- and left-handed users, or for those who need to switch between hands when cutting. The blade change is easier with a blade change button, and for those concerned with product protection when cutting, the safety knife is available with cutting depths of 9 or 5 mm as well as 17 mm.

Martor Australia

www.martoraustralia.com.au



15" fanless panel PC

iEi Integration's INOX-F15C-ULT3 15" stainless steel fanless panel PC is powered by Intel's 6th generation Skylake i5 and Celeron ULT processors. The system supports up to 32 GB of DDR4 SODIMM RAM.

The PC features a full IP69K stainless steel housing and the 15" touch screen comes with a choice of two options: a resistive touch screen or flat glass PCAP touch screen with 6H hardness. The stainless steel design and its IP69K rating make it a suitable option for deployment in the food manufacturing industry or any other industries where water ingress is an issue.

The system comes equipped with M12 connectors and supports a wide array of I/O inputs, including 2 x RS232/422/485 connectors, 2 x GBE ports and 2 x USB 2.0 ports. It also supports some expansion options, coming with a full-sized PCIe mini card slot, a half-size PCIe mini card slot and an M.2 B-Key.

The PC supports different storage options, from the traditional 2.5" HDD or SSD to mSATA SSDs and the M.2 B-Key standard, which is fast and compact. It has an operating temperature of -20 to +50°C.

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Automation in a boutique gin distillery

Being boutique doesn't preclude sophisticated automation technology.

The art and science of gin distilling have come together at Brogan's Way, a newly opened artisan gin distillery in Melbourne that runs on Siemens technology.

The distillery, producing premium gins, runs on a totally integrated automation (TIA) concept from Siemens — the same technology used by other leading brands such as Jack Daniels in the US and Coopers and Asahi in Australia.

Brogan's Way founder and co-owner Simon Carr said that these automation solutions are crucial to the success of small distillers like Brogan's Way as it gives them increased visibility of the process, which allows them to respond quickly, flexibly and cost-efficiently to current market demands, with no loss of quality.

"Technology is very important in the craft brewing and distilling market place, particularly when you don't have enough staff or time, which are your most precious resources. Technology is like having another member of the team," said Carr.

At the distillery in Richmond (Melbourne), Siemens has partnered with the original equipment manufacturer, Deacam, to enable Brogan's Way to control the variables in the distilling process to ensure quality and consistency in every batch.

With the craft brewing and distilling industry growing at an unprecedented rate, efficient and scalable automation has become an essential part of the industry.

The technology provided by Siemens gives smaller manufacturers the same scalability as much larger businesses.

Digitalisation makes the flood of data in breweries and distilleries transparent and easy to follow: from stock receipt to shipping, from the brewing vat to management, and from product development to the glass.

Siemens Australia and New Zealand Business Development Manager Leonie Wong said, "At Siemens, we have a longstanding relationship with many of the large brewing companies in Australia. It's exciting for us to show that our solutions are also extremely beneficial for small-scale manufactures such as Brogan's Way.

"In this industry, automation is the key to maintaining quality and consistency so we're really proud to have been involved in the beginning of their digitalisation journey and look forward to continuing to grow with Brogan's Way.

"Data is what drives quality decision-making and Industry 4.0 is about enabling all manufacturers — regardless of their size — to unlock the full potential in their operations."

Siemens technology at Brogan's Way automates the Fermecraft solution, which was designed and engineered by Deacam to address a real need for automation in the fast-growing craft brewing and distilling sector.

The modular automation solution helps craft brewers and distillers to regulate and automate processes including fermentation vessel control functions such as manufacturing process, cooling and heating, packing, pump control and trade waste.

Fermecraft has the scalability and flexibility to be retrofitted into new and existing equipment of various sizes.

Deacam Director Warren Bradford said, "Automation is critical for craft distilling to enable data capture and the ability to produce the same product time and time again. As an original



equipment manufacturer, Deacam understands the responsibility that we have to shoulder when selling our product to the craft brewing and distilling industry. It's essential that what we're using is scalable, it's essential that one part can talk to another part. It's important for a distillery to come along in two or three years' time and add extra pieces of equipment that can seamlessly integrate into their existing automation system."

The key technologies used at the distillery include the Siemens SIMATIC S7-1200 Programmable Logic Controller, SIMATIC Comfort Panel HMI, SINAMICS G120 Modular Drives and SCALANCE M876 Router, which automates the Fermecraft system to maintain the controller of the chiller. This is crucial, as the distilling process typically takes two to six weeks and throughout this period the temperature must stay within a strict bandwidth to ensure the quality of the product. The Siemens Fermecraft solution enables Brogan's Way to access the control data for this chiller remotely in real time to ensure each batch is at the perfect temperature.

Siemens Ltd

www.siemens.com.au

Valve island

The Bürkert Type 8647 AirLINE SP valve island has been designed to be compatible with the Siemens I/O system SIMATIC ET 200SP, enabling maximum system availability for pneumatic controllers.

The valve island was developed for use in the food and beverage, pharmaceuticals and cosmetics industries, as well as in water treatment systems. To save space it can be mounted in the control cabinet together with different Siemens modules for controlling up to 64 valve functions. The valves are directly connected to the Siemens I/O system. This enables fast and seamless integration both at the time of commissioning and later, during monitoring of operation.

The display of the number of switching cycles allows optimal preventive maintenance of the system to minimise wear and downtimes. Maximum system availability is achieved by means of the pneumatic valves in the supply channel: they are hot swap capable, so they can be replaced during operation.

The valve island features pressure sensors and an LCD, which displays detailed status information such as the position of the pilot and process valves directly at the device — both by means of icons and plain text. This enables fast detection and elimination of faults. The use of ring topology and the Media Redundancy Protocol (MRP) ensures continued operation of the system in the event that a communication client fails. This increases system availability.

The product has a crucial safety function: check valves in the exhaust duct. They ensure that pilot valves and actuators operate properly, by preventing pressure peaks. This eliminates the possibility of any mixing of different media.

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Automating Australia's wine industry with compressed air



Air-compressor manufacturer ELGi Equipments has been helping winemakers in India increase their process quality and speed with pneumatic equipment powered by compressed air, and these successes can be applied to Australia.

Australia is the fourth-largest producer of wine in the world, and while India is relatively new to wine growing, it has recently taken big strides in wine production. Sula Wines has created a strong brand in the Indian market, operating two wineries in Karnataka and Maharashtra with a total capacity of 12 million litres, and selling over 20 varieties of wines.

Automation is taking over the wine industry, helping improve process quality, reduce waste, increase productivity, cut costs and minimise incidents of human error. Winemaking involves five major stages — harvesting, crushing and pressing, fermentation, clarification, and ageing and bottling — and compressed air has applications in all stages.

Tom Fyfe, President of ELGi Australia, said that many vineyards have replaced hand-picking grapes with machine harvesters.

"The harvested grapes are sorted and then taken to the winery where they are de-stemmed and crushed with the help of pneumatic equipment.

"Filling machines are also powered by pneumatic valves with compressed air to lift the bottle and fill it to the desired limit.

The filled bottles are then transported through a conveyor belt to another section where the bottle caps are closed through a pneumatic operation," he explained.

In the case of sparkling wines, compressed air is used to wrap the foil cover over the cap of the bottle. The last process involves labelling the bottle in which compressed air is used to stick the labels onto the bottles.

Fyfe explained that Sula in India makes use of either fully or semi-automated pressing and crushing and bottling processes.

"Compressed air helps Sula maintain the quality and speed of production to meet the demands of a growing business," he said. "Sula has been using ELGi screw compressors for the past 15 years for these operations, and the team says that the quality is critical to their operations."

If there is any remnant of oil in the compressed air, it will affect the quality of the product; if there is any moisture in the compressed air, the blower used for labelling will not work efficiently.

"The ELGi screw compressors at the Sula wineries have extremely low oil carryover, and are fitted with oil filters to ensure there is no oil particles in the compressed air line," Fyfe said.

According to ELGi, the customer representative from Sula said ELGi compressors have helped the company "speed up production, minimise waste and ensure we get the same quality product in every batch of wine we produce at the winery".

Fyfe said Australia reportedly exports "approximately 750 million litres a year to the international export market with only about 40% of production consumed domestically. To keep up with the demand, processes must be automated and what better way to ensure accuracy and speed than with air?"

The company's recent acquisition of Australia's FR Pulford & Son, along with its wholly owned subsidiary Advanced Air Compressors, means it is well positioned to service the Australian market. Fyfe concluded: "Our compressed air and on-site nitrogen generation is well known in Australia."

ELGi Australia
www.elgi.com





Conveyor belt cleaning system

The Jet System 4 is an intelligently automated conveyor belt cleaning system that removes debris from the conveyor belt, and increases hygiene and cleanliness in dry cleaning environments. Dry steam jets clean deep into the structure of mesh belts without chemicals. Users can clean and sanitise using less than 30 L/h of water.

The portable conveyor belt cleaning system quickly and easily adjusts to a range of sizes of conveyor belt systems for maximum utilisation in a factory.

A touch screen gives access to simple controls, stored programs and advanced features for consistent conveyor belt cleaning.

Other features include: smart algorithm offers efficient cleaning pattern, spinner head rotates at 200 rpm and approved by Intralox warranty for a number of belts.

BioSteam

www.biosteam.com.au



Dough bin oil coating system

The PulsaJet Dough Bin Oil Coating System can ensure that the user's dough bins remain clean and operating at their peak, batch after batch.

Featuring some of Spraying Systems most innovative technology, this system features pulse-width modulation (PWM) as well as Automatic PulsaJet Nozzles which help to spray oil a full 360°. This process is repeated to ensure that all surfaces have been covered, which is an effective solution to an all too common issue.

This system is suitable for bakeries and can help to protect workers' safety by preventing slippery floors due to overspray. Other benefits include not having to use air atomising guns which create mist, as well as minimising wasted oil.

Users can take out human error and automate their systems with the help of the PulsaJet Dough Bin Oil Coating System. Not only could it prevent equipment wear over time but it could also save users money on excessive oil spraying.

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Cutting the MRO costs of a confectionery giant

RS has helped a leading confectionery manufacturer achieve significant cost savings in the indirect procurement process through its Purchasing Manager system.

End inefficient, costly procurement processes

Procurement teams and engineers face a number of challenges when it comes to the maintenance, repair and operation of their organisation's assets and facilities. The supply chain for indirect materials is complex due to the number of stakeholders involved, a fragmented supply base and the sheer number of products split across multiple categories. In addition, there is constant pressure from senior management to reduce costs.

As one of the largest suppliers of industrial supplies, RS is in a unique position to understand the complex needs of its customers and to help these businesses improve their processes and make efficiencies.

The crucial statistic for organisations to understand is that with indirect procurement, process costs can be twice as much as the amount spent on the products themselves. So if your organisation spends \$170,000 on purchasing products over the course of a year, you will spend a further \$340,000 on processing or 'soft costs'.

As such, there is significant value in reducing process costs, rather than focusing purely on the purchase price of individual items.

The challenge

An example of how RS has been able to help a customer take better control of its process costs is our work with a well-known confectionery manufacturer, a market leader within its category with a turnover in excess of \$170 million.

RS has worked with this company for a number of years, supplying a wide variety of products. This includes electrical and automation products, PPE equipment, tools and test equipment, which are used by maintenance engineers to help keep operations running.

As a large organisation, the confectionery manufacturer had a long-term plan to streamline their purchasing process,



which included reviewing all indirect spend. The procurement department was challenged to reduce admin and bureaucracy around the purchasing process so that it would be quicker and require less input from multiple stakeholders across the business.

Typically, the customer was spending significant time locating suppliers who had the products they needed and then comparing quotes; raising POs with a finance team; and arranging for delivery to be achieved in a time that didn't impact the day-to-day business.

They also felt there was a great deal of duplication and manual entry of information during purchasing. In short, the process was delaying procurement of low-value products, while taking valuable time away from employees' core responsibilities.

The solution

The first step was to process map the company's current procure-to-pay process. This was led by RS's dedicated team of e-commerce specialists and the customer's key stakeholders then, using a process cost calculator (produced in collabora-

tion with Chartered Institute of Procurement & Supply), it was possible to calculate the time taken for each process step in order to produce the total cost to the company for every order they place.

By doing this, it was identified that each PO raised took 88 minutes from end to end, costing \$126 per order. For RS alone, they were placing over 200 orders annually, with a similar number of orders being placed with multiple suppliers.

RS found that the simplest way to remove many of the issues (and additional cost) in the process was to introduce PurchasingManager to the customer. PurchasingManager is a web-based, order management system used alongside the RS website. Buyers can create account structures across their organisation, assign spend controls, cost centres and approval limits to help manage all RS Online purchasing.

The system allows the end user, usually an engineer, to go onto the RS website, choose the product they need, order it and see when the delivery will be made. Behind the scenes a confirmation request is sent to a senior colleague who can quickly approve the cost and the order is processed.

PurchasingManager addressed the authorisation process and became the only authorisation required to approve an order from RS. Once an order is approved, it is sent directly to RS without procurement being involved. The confectionery customer was able to use a single monthly blanket order rather than individual POs, meaning that the only PO processing now takes place at the end of the month.

The existing process was unnecessarily complicated:

- An engineer would choose a basket of goods, raise a paper requisition and send it to their superior for authorisation.
- Once this authorisation was granted the requisition was sent to procurement. Procurement would then check the price online before raising a purchase order.
- The purchase order would need to be signed off by the head of procurement before the PO was emailed to RS for fulfilment.

The procurement department was challenged to reduce admin and bureaucracy around the purchasing process so that it would be quicker and require less input from multiple stakeholders across the business.

- Once the goods were delivered, a three-way match was needed between the email request, the PO on their system and the individual invoices.

The outcome

The customer now has a simplified workflow with empowered end users, which has significantly reduced processing costs, enabling all functions involved in the indirect purchasing process to focus on value-added activities in their respective roles. The customer has moved from an average cost per order of \$126 before PurchasingManager was introduced, to \$78 now. The number of orders also increased to 1089 annually as they consolidated more orders with RS, reducing their supplier base. Based on the new cost per order, this equated to a \$51,836 saving annually compared to their old process.

The entire purchasing process has been greatly speeded up, more employees are ordering from trusted suppliers (rather than using local or online purchases), which improves contract compliance, and parts are being successfully delivered when engineers want them, which means there is far less downtime.

The result is that the customer has gone from an inefficient, costly process with too much duplication of tasks and a lack of clarity to becoming highly efficient with real transparency throughout the purchase-to-pay process. 🐮

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Making cheese-making lean

Mozzarella and other cream cheese specialty manufacturer Züger is using an end-to-end CSB-System software solution to keep its processes at the factory as lean as possible. This has enabled the company to efficiently plan and optimise workflows and information throughout all operations and has led to a 50% time saving in order picking.

Züger processes milk from 400 vendors for about 700 different products. There are 2500 packaging components, seven production departments and three high-bay storages. CSB's EPR software is able to optimally control all processes in administration and resource management. All data from milk acceptance, production and inventory management to picking and shipping is entered directly in the ERP system for further processing.

"Today, we have CSB as a turnkey solution," explained Züger CEO Christof Züger. "This means we have only one system for financial accounting, human resources, procurement, inventory, sales and quality management."

For its internal logistics, Züger uses a combination of high-bay storage and mobile picking. Items are stored in a first-in-first-out sequence to ensure goods can be delivered as fresh as possible. The system links every pallet with the sell-by date and lot number, and also controls the automatic stock removal of pallets as replenishment for picking.

Customer orders are transmitted directly to the touch panels of the electric forklifts via a wireless connection. The screen shows in which area of the picking zone the pallet with the ordered product is located. The picker scans the pallet label, removes the item and confirms the picked quantity at the scanner. When a pallet is empty, the system automatically requisitions a new pallet from the high-bay storage.

"This ensures permanent replenishment of the picking zone so that customer orders can be processed in a quick and efficient manner," Christof Züger said. "Compared to the past, we have been able to save around 50% of the time here. At the same time, our paperless packing methods have minimised error rates."

In terms of planning, the introduction of CSB Coverage Planning is able to provide availability of materials and capacities, and efficiently drive internal processes so that all orders can be delivered on the requested date and at minimal cost. Important data from procurement, production, inventory and sales is available in real time, and the availability of materials and capacity is monitored permanently, meaning inventory capital commitment is also reduced.

Equally important, in the event of any returns, CSB-Document Steering provides a standardised procedure that



CSB-System software solution in action at Züger.



Mozzarella production at Züger.

enables the company to quickly identify the reason for the return and respond accordingly.

Züger is continuing to drive its digitalisation even further both at its plant in Oberbüren and with the upgrading of its German operations to CSB. Further CSB solutions to be introduced at Oberbüren include a maintenance module that facilitates early maintenance and repair of machinery, and hands-free terminals in goods receiving so that data is transferred to the EPR system even faster.

"We believe we have already installed a lot here in Oberbüren so we can efficiently live a kind of Industry 4.0," Christof Züger concluded. "This has many benefits for us, but also for our customers."

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Safety controller

Omron has released the NX series Safety Network Controller, which supports both CIP Safety and Safety over EtherCAT (FSoE) protocols. It is designed to give manufacturers the ability to reduce design and maintenance time for efficient global production of various systems.

In conjunction with the company's NX102 machine automation controller, both EtherNet/IP and CIP Safety and EtherCAT and FSoE can be used simultaneously, which makes

building safety systems for large production lines using robots from different vendors possible. Various models are available, providing up to 254 CIP Safety connections and real-time safety control of up to 12 motors.

Featuring automatic programming and user-defined function blocks, it reduces safety control programming time. Together with online functional test and offline simulation, safety management can be easily implemented by inexperienced workers, leading to maximised productivity.

The unit features data logging and restore ability to quickly identify the cause of line stoppage and offer easy replacement without the use of software.

Other features include: online functional test and data logging for system verification; third-party IO connectivity and controller-to-controller safety communication; and memory card and auto configuration restore.

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Lecithin spray system

The AutoJet Lecithin Spray System is suitable for a variety of dairy applications. Using the system, lecithin can be added efficiently to the production process, while ensuring correct dosage and optimal coverage in every batch.

Traditional systems struggle with this oil due to its physical characteristics, flowability and surface tension. With the AutoJet Lecithin Spray System this is no longer an issue, as it helps to produce more consistent results over time, no matter the quantity of lecithin oil used.

With over 20 different time settings available, among other configuration options, Spraying Systems Co. can help design a system which is suitable for the user's business.

Spraying Systems Co Pty Ltd
www.spray.com.au

Spherical pneumatic transfer magnet

The RE80 Spherical Pneumatic Transfer Magnet is aerodynamic and is designed to extract foreign metal fragments from high-velocity pneumatic transfers.

Foreign metal fragments such as tramp metal, work-hardened stainless steel and stone, and fine dust-like metal shavings can have devastating effects if they contaminate the final product. Food recalls, brand reputation damage, consumer health risks and financial loss are common consequences of metal contamination.

The spherical pneumatic transfer magnet enables food processors to help minimise these risks using RE80 +11,000 gauss magnet elements to attract and retain magnetic fragments. The company claims the magnet is superior to original probe, bar and blow-line grid installations inserted transverse to the product flow. This is achieved by providing a large surface area for retention of weak magnetic fragments on the back of the magnetic sphere, outside of the product zone as the powder/product exits the chamber. The aerodynamic design of the magnet prevents blockage of product and also minimises product particle breakdown.

The spherical magnet is suitable for starch, powders, flours and ingredients. It is popular in large flour mills and bakeries to magnetically clean product conveyed to bagging operations, bulk out loading or direct filling of flour trucks. It is suitable for high-velocity and large-volume vertical installations in blow, vacuum, gravity and pneumatic transfer lines.

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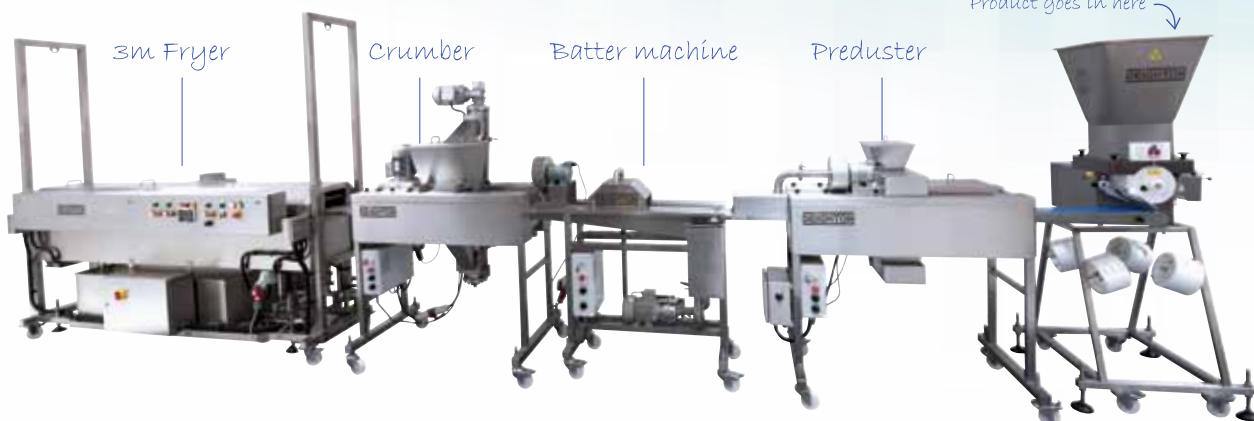


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Wastewater treatment plants don't belong in a catalogue

Dissolved Air Flotation (DAF) systems have been around for a long time and it would seem that they are here to stay. That said, if anything, DAF manufacturers are getting more — rather than less — enthusiastic about the application of DAF technology in new areas of treatment or processing.

Applying existing technology such as DAF for a new purpose can have its rewards, although it can be dangerous unless the principles of DAF are fully understood. There are far too many companies selling DAF systems from a catalogue without taking into consideration exactly what they are going to be used for.

The specific design and features of a DAF system really do matter, and not only because the unit is expected to fulfil its duties. An incorrectly designed system can absorb considerably more power than it needs to, and it can take up unnecessary space.

Many companies simply quote standard sizes of DAF systems which are based on a flow rate that the unit is deemed to be able to treat. You may get lucky if the stream that you want to treat is similar to what that particular design is based on. However, to invest considerable money while leaving a successful outcome to chance is not a particularly virtuous or smart business decision.

There could be deemed to be two general areas to a DAF design being firstly, the actual hardware and secondly, the process. The hardware could be defined as the actual DAF vessel, the sludge removal technology, an efficient means of dissolving air in water and injecting it at the inlet of the DAF and a system that ensures laminar conditions. We would have to assume that most DAF manufacturers have this part of the equation correct otherwise they wouldn't have built enough systems to devise their catalogue.

The process side of the equation is where knowledge, experience, skill and — equally as important — having the ability to apply the technology to the application is critical.

The most commonly overlooked aspect of designing a DAF is getting the air-to-solids ratio correct. This is basically a ratio of the mass of air that is dissolved and released into the incoming stream to the mass of solids that are present. Many text books will suggest a range of anywhere between 0.01 and 0.2 but this is 20-fold difference. Given that the pumps used to generate the dissolved air stream are by far the most power-hungry component in a DAF system, if you

are generating 20 times as much dissolved air than you need to, you are paying way too much in electricity.

The dissolved air flow also affects the surface loading rate. Thus for a given size DAF system with a defined surface area, decreasing the recycle stream flow will reduce the surface loading rate, thereby allowing treatment of a greater flow in the same unit.

Like many DAF suppliers, Hydroflux has adopted a range of standard DAF vessels, the design of which is based on ensuring that the hardware is optimised from a process point of view and also that it is designed for economical fabrication. How we apply the range is where we differ. At Hydroflux, we have a deep understanding of both DAF systems and the DAF process. We design each DAF system to suit the application in question.


Our intelligent software program considers a wider range of factors including solids load, temperature, surface loading rate, solids loading rate, fluid density and air solubility. This is to ensure that the dissolved air system is ideal for your application and not simply based on a text book guideline. Furthermore, one would be hard pressed to find a DAF related project that at least one of our engineers does not have knowledge of or experience in.

DAF systems are not inexpensive and are required to be extremely reliable — often having to operate 24 hours a day, 365 days a year. So making sure that your system is designed specifically to meet your needs is of paramount importance.

The capital cost for a properly designed DAF system may be a little more, but it may actually be a lot less, and you can be assured that a DAF system from Hydroflux will present far less problems and certainly incur lower costs in the long term.

For more information: <https://www.hydrofluxindustrial.com.au/industrial-wastewater/dissolved-air-flotation-daf/>.

About the Hydroflux Group

The Hydroflux Group comprises eight companies based in Australia, the Pacific and the UK, providing design and build, equipment, processes and operational services in water and wastewater treatment. Hydroflux Industrial specialises in industrial wastewater treatment including designing and constructing plants and supplying equipment across all sectors. Hydroflux Industrial is a wholly owned subsidiary of the Hydroflux Group. 

Hydroflux Industrial Pty Ltd

www.hydrofluxindustrial.com.au

Spillage prevention plug

The Yelloc International manufactured Foodline White Service plug is suitable for food and chemical spill prevention in industrial and commercial areas requiring the use of FDA-approved materials.

The Foodline is made from a rubber compound made and intended for repeated use. Typical applications include process and chemical facilities such as pharmaceutical factories, bakeries, breweries, hotel kitchens, cafes, bars, restaurants and any other application where food is being handled or processed.

In addition, the plugs are suitable for use for both service and storage preventing contaminants from entering the system, tanks and pipework or hose lines during repairs or disconnection.

The Foodline White Service plug is a solid-shaped plug made of high-quality durable rubber, resistant to alcohol or other washing liquids, temperature rated between -25 and +90°C for non-pressurised systems and suitable for re-use. Available in sizes from 1 mm up to 130 mm diameter, the range of each plug allows it to be inserted between a minimum to a maximum pipe size. Five individual plug sizes are available: 1–10, 5–22, 13–42, 35–80 and 60–130 mm.

The conical lightweight design enables a fast, flexible, 'grab and seal' installation. This ensures a clean workspace in safety-critical areas.

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Pregnancy-style test for *E. coli* and romaine lettuce

With seven deaths, 31 suffering kidney failure, 159 hospitalised and at least 339 Americans and Canadians sickened since 2017 after eating romaine lettuce contaminated with *E. coli*, news of a faster *E. coli* test is welcome.



Western University, Ontario, has developed a kit that detects a protein unique to the pathogenic *E. coli* O157 bacteria and, using flow through technology, is able to show results in hours rather than days.

Food samples to be tested are incubated for a few hours then a sample is placed on a pad. After 15 minutes, the pad displays one red line to show it worked properly — and a second if the sample contains *E. coli* O157; much like how pregnancy tests show their results.

The developers claim their kit also makes the process of testing for *E. coli* O157 cheaper than existing technology, which could make smaller-scale producers more amenable to testing their products.

Current food testing methods for *E. coli* typically rely on culture and by the time results are available some days later fresh produce has been shipped to retailers, sold and eaten. With results available in hours, rather than days or weeks, this new test will enable food processors to ensure food is uncontaminated before it is shipped.

Use of a cheaper, rapid test will mean processors can test more frequently.

The romaine lettuce crisis

A common source of *E. coli* illness is raw fruits and vegetables that have come in contact with faeces from infected animals.


Leafy greens, such as lettuce, can become contaminated in the field by soil, water, animals or improperly composted manure. Lettuce can also be infected by bacteria during and after harvest from handling, storing and transporting the produce.

Contamination in lettuce is also possible at the retail environment, in the refrigerator or from counters and cutting boards through cross-contamination with bacteria from raw meat, poultry or seafood.

Since 1 April 2017, the Canadian Food Inspection Agency has tested more than 2000 samples of imported fresh vegetables and salads, including romaine lettuce and pre-packaged salads containing romaine lettuce, as part of its regular microbiological surveillance program.

None of these samples have proven positive for *E. coli* O157. This means that contamination levels are low and most romaine lettuces are uncontaminated, but the real need is to identify those lettuces that are contaminated. More tests, with low cost but high accuracy, will help public health officials and produce marketers weed out the affected produce. Western's new test will be invaluable in this circumstance.

In his blog Publisher's Platform: How does this "Romaine" acceptable?, Bill Marler asks: "What will growers, processors, shippers, grocery stores, restaurants, consumers, regulators, and politicians do? Good readers – ideas?". Possibly the best response was from Sue: "This should fix it: Move the growers' focus from their wallets (greed) to their amygdala (fear.) Host a weekly luncheon for all Western Growers executives - attendance mandatory. Menu: Giant Caesar salad made with romaine lettuce from each grower. Eat it or close down."

The rapid test was developed at Western University's Schulich School of Medicine & Dentistry and Robarts Research Institute with support from Mitacs, a federal non-profit that encourages academic and industrial collaboration with the food industry. 

Near real-time detection of lactose and spoilt milk

Biological sensors that can detect substances like lactose and spoilage enzymes in milk on the spot are the basis of the next generation of diagnostic tools that will impact food safety, environmental monitoring and human health.

A CSIRO-developed Cybertongue that can rapidly detect lactose and spoilt milk has just been licensed to start-up PPB Technology.

"It is estimated that 4% of Australians are lactose intolerant and this problem may affect up to 65% of the world's human population," said former CSIRO researcher and PPB Technology founder Dr Stephen Trowell.

"We are seeing a growing number of people in Australia and around the world preferring lactose-free dairy alternatives.

"The global market for these products is set to grow to \$15 billion over the next six years.

"For milk processors, current diagnostic methods for lactose are expensive and it can take up to a week to receive results, causing costs and delays for processors and increasing prices for consumers.

"By using a special biosensor for lactose, the Cybertongue technology provides accurate and close to real-time measurements anywhere in the production line, meaning products can be distributed sooner without risking product quality."

CSIRO is developing future sensors for wider applications of

Cybertongue as part a formal strategic partnership between CSIRO and PPB Technology.

"The unique way we have built the technology means we can develop sensors that detect a wide range of substances including toxins, allergens and enzymes," said senior CSIRO researcher Dr Alisha Anderson.

This means the technology can be applied to a range of applications and industries such as food, environmental monitoring, biosecurity and human health.

"In human health this technology could mean potentially fatal health conditions like sepsis could be diagnosed in just a few minutes rather than current methods which take a few hours, potentially leading to faster and more effective treatment," Dr Anderson said.

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Nifty way of detecting toxic strains of *E. coli*

Aditi Risbud Bartl

Finding a fast and inexpensive way to detect specific strains of bacteria and viruses is critical to food safety, water quality, environmental protection and human health. However, current methods for detecting illness-causing strains of bacteria such as *E. coli* require either time-intensive biological cell cultures or DNA amplification approaches that rely on expensive laboratory equipment.

Now, Josh Hihath, an associate professor of electrical and computer engineering at the University of California, Davis, and colleagues at the University of Washington and TOBB University of Economics and Technology in Ankara, Turkey, have adapted a molecular electronic device called a single-molecule break junction to detect RNA from strains of *E. coli* known for causing illness. The findings were published in the journal *Nature Nanotechnology*.

"The reliable, efficient and inexpensive detection and identification of specific strains of microorganisms such as *E. coli* is a grand challenge in biology and the health sciences," said Hihath. "Our technique could pave the way for rapid, straightforward detection of pathogens, antimicrobial-resistant bacterial strains and biomarkers for cancer."


Hihath and his team focused on *E. coli* since it is a common pathogen that could easily be found in the food supply, but might not cause illness in a benign form. The worst strain of *E. coli*, called *E. coli* O157:H7, produces a toxic substance called Shiga toxin that causes bloody diarrhoea, kidney failure and even death.

Single-molecule break junction devices consist of two metal electrodes with atomically sharp interfaces that are brought into contact in a liquid solution of interest, such as a solution

containing RNA sequences from *E. coli*. As the electrodes are brought into contact and pulled apart, an electrical bias is applied and the current is measured. This process is repeated hundreds or thousands of times to determine the conductance of a single molecule.

"One of the questions we asked is, how small of a change in the sequence is needed to cause a meaningful change in the electrical conductance?" Hihath said. "The smallest thing we can change is a single-base, so we decided to see if a single-base change can be measured."

By testing short sequences of RNA bound to DNA with chemical linkers, the team examined an *E. coli* sequence that would produce Shiga toxin. Their findings showed that changes in the electrical resistance of RNA due to a single-base change could be measured, which would allow them to see not only if a sequence was *E. coli*, but the specific strain of *E. coli* that produces Shiga toxin.

"A system that could selectively identify short sequences of DNA or RNA opens up new avenues for developing an electronic sensor platform for a wide range of applications," he added. "Eventually, we want to get to the point where we can extract RNA samples from real organisms and measure their conductance on a sensing platform." 

NEWS

Real-time food pathogen detection

In the US, the Centers for Disease Control and Prevention estimates that foodborne pathogens sicken about 48 million people and kill about 3000 each year. Pro rata the incidence in Australia would be very similar. In the US, food manufacturers spend nearly \$3 billion each year on food safety tests.

Imagine if the foodborne pathogens could be detected in real time. Contaminated food would be less likely to reach consumers and the disease load on the community would be reduced. Now, a Purdue University technology is looking like it could ultimately deliver real-time pathogen detection.

Purdue's technology involves using a biochip to collect and analyse microbes in food samples. The innovation also uses enzyme formulations and software to analyse food microorganisms within four hours, instead of the current two to four days it typically takes.

Michael Ladisch, a Purdue distinguished professor of agricultural and biological engineering, Eduardo Ximenes, a senior research scientist at Purdue's Laboratory of Renewable Resources Engineering, and their research team won the grand prize in the 2014 FDA Food Safety Challenge for their automated filtration technology to detect *Salmonella*. They have now enhanced the technology to allow multiple samples to be tested at the same time and to test for other foodborne illnesses such as *E. coli* O157:H7.

"Our technology continues to make giant leaps in health and preventing more people from being sickened by foodborne illnesses," Ladisch said.

"The other great advancement we have made since 2014 is the ability to test up to four samples at once, and we are continuing to increase that number," Ximenes said. "A foodborne illness outbreak results in hundreds of samples being sent to the FDA each day, so making the process faster is critically important."

The researchers have worked with the Purdue Office of Technology Commercialization on patents for their innovation and are looking for partners to test and commercialise their technology.



Image courtesy Michael Ladisch.

A biochip is used to collect and analyse microbes in food samples and speeds up the process to detect foodborne illnesses.

Bacteria, yeast and fungi identification

Bruker MALDI Biotyper systems provide high-speed, high-confidence identification and taxonomical classification of bacteria, yeasts and fungi. Classification and identification are based on proteomic fingerprinting using high-throughput MALDI-TOF mass spectrometry. The accuracy and speed of the methods compare favourably to classical methods.

Two applications of the MALDI Biotyper have been recognised and published as Official Methods of Analysis SM (OMA) of AOAC INTERNATIONAL, for selected pathogen confirmation and identification of other bacteria from various agar plates, leading to two standardised methods. Together, AOAC 2017.09 (for the confirmation and identification of *Salmonella* spp., *Cronobacter* spp. and other gram-negative organisms) and AOAC 2017.10 (for *Listeria monocytogenes*, *Listeria* spp. and other gram-positive organisms) have been awarded the 2018 AOAC Method of the Year by the Official Methods Board of AOAC INTERNATIONAL.

The MALDI Biotyper has also been validated by MicroVal for the confirmation of several foodborne pathogens. The MicroVal committee has members from Europe and North America, including experts from food safety authorities, food testing laboratories and method developers. Together with MicroVal and the Lloyd's certification body, Bruker has been an early adopter of the new technical rules of ISO/DIS 16140-6 for validation of confirmation and typing methods.

The AOAC Official Methods Board has determined that, based on their novel approach of confirming and identifying organisms, both new MALDI Biotyper Official Methods of AnalysisSM, AOAC 2017.09 and AOAC 2017.10, will receive the AOAC Method of the Year award.

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Pathogen detection in raw chicken

Surveillance studies in Malaysia have shown that around 90% of raw chickens in the market are positive for *Salmonella* and *Campylobacter jejuni* contamination. Approximately 35–88% of raw chicken being contaminated with *Salmonella*; 50–90% of farmed chickens and 30–45% of raw chicken contaminated with *C. jejuni*.

The increased scale of food production and global food trading have raised the risk of failures in food safety monitoring systems to detect foodborne pathogens. Unfortunately, the conventional laboratory-based testing approaches of raw chicken are too slow and can no longer meet the demands of today's large-scale food production. It currently takes two to seven days to complete. A major problem in the current approaches to detect foodborne pathogens is that products must be sacrificed when tested, making the process an expensive affair as it reduces profit margins and raises price. Although new molecular approaches have been adopted to speed up the detection time, the widespread use of this technology is hampered by challenges such as high operational cost and dependency of highly skilled labour. The technology also suffers from low performance fidelity, which is caused by biological interference.

Dr Chai Lay Ching, food microbiologist from Faculty of Science, University of Malaya (UM), proposed a solution to identify pathogenic bacteria in food based on the detection of specific volatile organic compounds (VOCs) produced by bacteria.

Microorganisms are known to emit specific VOCs as gases during the process of breaking down food. The VOCs are a diverse group of carbon-based chemicals that are volatile at ambient temperature and can be detected through smell. Different types of bacteria produce their

own VOC signatures. These findings have led the researcher to develop a novel and rapid method to detect bacterial spoilage in food products in a real-time fashion and non-destructive manner, and she has been named as one of the three winners for the Malaysian L'Oréal-UNESCO for Women in Science Award.

VOCs analysis has been used in clinical diagnosis of various bacterial diseases in humans, such as detection of *Clostridium difficile*, *C. jejuni* and *Vibrio cholerae* in patients' stools. Preliminary laboratory results showed a distinctive VOC-profile associated with *C. jejuni* in specific laboratory conditions, suggesting the potential of VOC-based biosensors or electric noses that can sniff out these highly pathogenic bacteria in food.

"I accidentally found that *Campylobacter* produces a very specific scent when we grow them on the agar plate. This allowed me to correctly identify samples with *Campylobacter* from the negatives ones," Dr Chai explained.

The findings from this study will generate a database of volatiles of foodborne associated *Salmonella* and *C. jejuni* contamination in raw chicken and different carbon substrates.

This work is key for future development of a real-time monitoring system that meets the ideal high-throughput detection criteria. It can be automated, is easy to perform and instantly detects contamination. The application will be key in saving lives and reducing morbidities associated with these bacteria, as well as helping the food industry to save cost. The successful completion of this project will lead to a better understanding of bacterial metabolism and adaption in different types of substrates, which will help us understand the impact of environment on bacterial growth.

Hygienic cable gland with NPT thread

LAPP Australia's SKINTOP HYGIENIC NPT cable gland is available with NPT thread and certified to NSF/ANSI 169 for 'food zone non contact'. This makes it suitable for areas in food production where especially tough hygiene rules apply. The cable gland can be used for filling systems in dairies or breweries, as well as in the chemical and pharmaceutical sectors.

It has a hygienic design and NPT connection thread with no gap and no visible thread. It meets the standards of the American National Sanitation Foundation (NSF) and is UL certified.

It is available in all standard diameters with the corresponding counter nuts. An EMC version that reliably conducts away unwanted emissions, the SKINTOP HYGIENIC SC NPT, is also available. The SKINTOP INOX NPT is a more compact variant with NPT thread that is suitable for plants in which the cable gland is only used in the spray zone or non-product zone.

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packaging & labelling



Crisp manufacturer doubles packing speed and reduces wastage

UK gourmet chips manufacturer Pipers Crisps has doubled its packaging capacity and reduced waste thanks to the installation of high-speed packaging solutions. The new installation has enabled Pipers Crisps to increase productivity, while maintaining the highest level of product quality through enhanced seal integrity.

Based in Brigg, Lincolnshire, the company was established in 2004 by three farmers who joined forces to produce great-tasting, quality chips using local potatoes. Today, its award-winning products, recognised nationally for their unique and bright packaging design, are distributed throughout the UK, as well as exported to Europe and the US. Following a period of impressive growth in the past two years and rising popularity of its products, Pipers Crisps needed to add new packaging lines to its existing packaging fleet to cope with the additional demand.

Meeting increased demand

With existing equipment achieving throughput speeds of only 80 bags per minute (bpm) for its smaller bags, Pipers Crisps needed to substantially increase bagging speed. The premium chips manufacturer opted for two tna robag FX 3ci vertical, form, fill and seal (VFFS) packaging solutions. These high-speed baggers feature a very short vertical product transfer from the scale to the pack, helping to maximise packaging performance. The new set-up allows Pipers Crisps to package a variety of bag sizes at speeds of up to 140 bpm, resulting in a 75% increase, in line with the company's capacity uplift.

Catering for a variety of snacking occasions, the chips manufacturer needed a packaging solution that could switch between two different pack sizes — 40 and 150 g — of high-quality pillow bags, without lengthy changeover times that would slow down or even stop production. With its lightweight formers, unload assist and twin film spindle, the flexibility of the tna robag FX 3ci makes changeovers fast and easy, enabling operators to easily switch from one bag size to another on the same packaging line.

Assuring quality and seal integrity

The Pipers Crisps brand is renowned for its premium positioning. In such a highly competitive market, quality is crucial to help differentiate brands on retail shelves. It was therefore important that the chosen packaging solution could maintain seal integrity and reliably produce high-quality bags that do not compromise the shelf life of the product within it.

"During the packaging process, pieces of chips can get caught in the bag seal, compromising seal integrity and reducing the shelf life of the product. When this occurs, it can often lead to product rejects and waste," explained Simon Hill, Regional Sales Manager at tna.

With its innovative rotary jaw design and advanced sealing technology that offers improved seal performance at high



tna robag FX 3ci in action at Pipers Crisps

speeds, the tna robag FX 3ci proved to be the perfect solution. Featuring patented stripper tube closures, the completely integrated packaging system allows

for better control of the product through the packaging and filling cycle, therefore helping to control dust generation and minimising crumbs in the end seal of the bag.

The tna robag FX 3ci was also customised with product-in-seal-detection (PISD) software that monitors product in the seal and jaw area. If seal integrity is compromised, the system immediately alerts the operator so that bags can be quickly removed from the line for further inspection. That way Pipers Crisps is able to ensure that each bag meets the highest quality standards while keeping waste to an absolute minimum.

Richard Mottram, Factory Manager at Pipers Crisps, commented: "Before the installation, we experienced 3% wastage at 80 bpm, as we had to manually detect and remove any bags with compromised end seals or pleats before they entered the packaging area. Now, our wastage is down to 1% at 140 bpm, which has surpassed our expectations. As a result, it has helped us gain better control over product losses and achieve operational cost savings, while contributing to quality assurance."

tna solutions Pty Ltd
www.tnasolutions.com



Semi-automatic tray sealing machine

A semi-automatic, drawer type, tray sealing machine with full vacuum facility, the Proseal TTe is capable of sealing up to 10 vacuum/gas packs per min with a two-impression tool.

The machine is the latest addition to Proseal's 'e' technology range, which is characterised by its flexibility to perform any style of heat seal to a pre-formed tray, whether atmospheric, MAP, VMAP, Skin, Skin Plus or Skin Deep.

Each of these options can be added at the point of purchase or a later date, or removed if necessary. This enables customers to futureproof their investment by giving them the flexibility to change pack formats in line with customer demands and market trends, without having to purchase new equipment.

Simple in design and operation, portable and castor-mounted, the TTe is convenient to use. It features a 5 min tool changeover, a simple and accurate film-feed system with an easy film route and a maintenance-friendly, robust construction.

Its 'Auto-Tool' feature means that, at the touch of a button, it automatically locates and connects the tooling to machine functions, including all MAP functions.

The machine provides accurate temperature and seal pressure control, as well as an automatic seal operation with a precise seal dwell time.

The TTe tray sealer also offers a high-accuracy tool alignment system that provides a consistent sealing or film-cutting relationship with the tray flange profile.

The tray sealer features food industry-approved hygienic construction and washdown protection, as well as full Category 3 guarding.

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CIJ printer for marking and coding

Leibinger's entry-level JET One is an industrial inkjet printer for marking and coding food packaging, beverages and consumer goods.

It has fixed and variable data such as best-before date, LOT and batch number and graphics. The marking takes place without contact with flying drops of ink, making it suitable for convex and concave, rough and smooth, flat and relief-moulded product surfaces.

Users can print country and industry-specific fonts with a character height of 1.5 to 8 mm in up to two lines. Since the ink dries in less than a second — on plastic, glass, wood, metal, ceramics, technical composites, cardboard and paper alike — the CIJ printer can handle production speeds of up to 268 m/min. Ink consumption is minimal as it can print up to 120 million characters with only 1 L of ink.

The printer has a Sealtronic feature, a nozzle sealing system that keeps the ink fresh during production breaks. If the user switches off the printer, the gutter moves to the nozzle with a spindle drive. Only then does the inkjet turn off. The ink circuit is therefore hermetically sealed.

It features the key interfaces for integration into the company infrastructure: via a product sensor input (PNP/NPN 24 V), an incremental encoder input (TTL 5 V, HTL 24 V, RS 422 5 V), a digital input, three digital outputs and a USB port. The print head can be flexibly positioned due to a 3 m-long umbilical cable — even for overhead applications.

Leibinger

www.leibinger-group.com/en/

Microwaveable carton for hot drinks

SIG's Heat&Go aseptic carton pack is aluminium free and can be heated in the microwave in a vending machine, store, cafe, home or office.

The carton can be heated in the microwave up to 60°C, with a recommended temperature of 50°C.

It offers protection to beverage products and can be produced on existing SIG filling machines with a simple one-time upgrade to enable it to run standard and aluminium-free material structures. By replacing the aluminium foil with a high-barrier film and a light blocking pigment, the carton protects the product from oxygen ingress, flavour migration, light and water. It is suitable for still drinks and low-viscosity, sensitive enhanced juice and liquid dairy beverages.

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Industrial colour label printer

The VIP Color VP700 is designed to be a reliable and economical Memjet label printer. It prints labels up to 216 mm wide at 304.8 or 152.4 mm/s. It is a suitable colour label printer for coffee and dry goods manufacturers. The printer has five large ink tanks and each tank contains 250 mL of Memjet ink so the print cost per label is low.

It comes with a label unwinder and option label roll rewinders. It can be paired with digital label laminating and cutting machinery that enable users to laminate the printed material (if desired) and diecut to any required shape or size before slitting and rewinding into small, manageable rolls.

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www.labelpower.com.au



Soft touch films for product labels

Jet Technologies has announced its Entice range of soft touch films for consumer product labels that are designed to add a sense of luxury.

The soft touch films are now available pre-laminated as label material. With these materials ready for print, applications include boutique beverage, gin, whiskey and wine labels (water-resistant substrate).

Soft Touch Overlamine adds soft touch to any substrate, for all types of printing, while the Entice Pressure Sensitive range is available in matte black, gold and silver label stock with a premium soft touch finish for label printing.

Jet Technologies
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Sealed Air expands protective packaging solutions

Packaging supplier Sealed Air has acquired AFP, which specialises in custom-engineered protective packaging, with the expectation it will help the company expand its portfolio and design capabilities.

AFP designs and produces foam, corrugated, moulded pulp and wood packaging solutions, and has 260 employees across six facilities in the US, as well as facilities in Asia and Mexico. The acquisition will allow Sealed Air to better position its fabricated foam products such as EcoPure, which it describes as a sustainable solution made from plant-based resin.

“With the acquisition of AFP, coupled with our 2017 acquisition of Fagerdala, Sealed Air will further expand its capability to provide fabricated designs directly to customers in markets such as electronics and transportation,” said Kenneth P Chrisman, President of Sealed Air’s Product Care division. “Sealed Air will also continue to leverage its established network of strategic fabricator partners, which remains an integral part of the company’s strategy to deliver custom, high-performance, sustainable packaging solutions.”



MHT acquisition strengthens Krones’ PET capabilities

German company MHT Holding, which, along with its subsidiaries, offers a variety of injection moulding tools for food and beverage packaging producers, has been acquired by Krones.

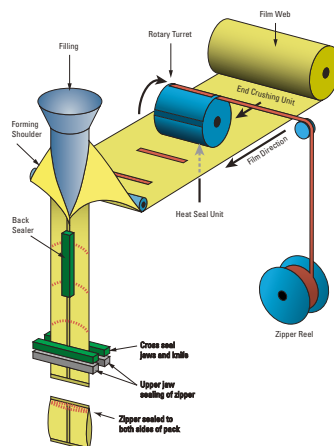
Generating around €5 million annually and employing 125 people, MHT will close a gap in the Krones PET product portfolio. Krones will now be able to offer integrated solutions from PET preform manufacturing and stretch blow moulding all the way through to PET recycling — and then back to the manufacture of a new preform.

MHT will continue to be headquartered in Hochheim and the current management will continue to run the business.

This latest acquisition follows Krones buying 70% of Integrated Plastics Systems AG last April 2018. The acquisitions of MHT and Integrated Plastics Systems AG are both enhancing the Krones PET competence and portfolio.

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Liner-free compatible label printer

Epson Australia's TM-L90 Liner-free compatible label printer is suitable for quick-service environments such as coffee shops, delicatessens and restaurants, both quick and traditional service. Food operators can easily identify customer orders on takeaway bags and boxes, and label orders for delivery.

Designed to print on both adhesive-backed media and thermal receipt media, the printer provides flexible, hospitality-strength, liner-free labelling that improves efficiency.

It prints liner-free labels at a speed of up to 90 mm/s and thermal receipts at up to 170 mm/s at 203 x 203 dpi, supports variable length label output and accepts label rolls up to 102 mm in diameter.

The printer can easily be mounted in three ways (vertical, horizontal or wall mounted) and offers margin reduction options to reduce receipt size, automatic media type and paper width detection, sensor for auto cutting and modified support rollers to minimise paper jams. It comes with a 12-month limited warranty and supports multiple interfaces, including serial, Ethernet and powered USB.

Other features include special print options reduce paper usage by up to 30%, low power consumption reduces cost and environmental impact and easy media switching between 40, 58 and 80 mm paper widths.

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Information management solution for filling line

SIG's combiLink is a single and flexible information management solution for filling line operation.

By connecting every machine in a filling line, the system collects unlimited data and shows it in preconfigured or personally designed reports. Users can view charts showing operational and technical efficiency and view downtime incidents from their desktops, tablets or smartphones. Smart notifications can alert the team to incidents, avoiding bottlenecks and costly downtime.

The smart factory solution offers a new way of monitoring and analysing the efficiency and productivity of a filling line, enabling customers to take on-time decisions fast and to optimise operations.

Producers get a single end-to-end window to view current and historical levels of efficiency and performance, while also seeing where improvements can be made in the future. Its connectivity is based on the latest industrial communication standard OMAC, enabling it to collect unlimited data over OPC UA technology from every machine and store it securely.

It can also send out data to MES, ERP and other business intelligence systems. Its open architecture and standards-based interface connect easily to third-party applications such as cloud-based systems and predictive analysis tools. This two-way communication enables unlimited operation applications with the option of customer plug-ins.

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Thermal transfer overprint date coder

The tna intelli-date 5 is a high-speed thermal transfer overprint (TTO) date coder with airless design and integrated print code verification technology for continuous high-quality printing on flexible bags.

The date coder features an ultrafast printhead movement that is able to increase throughput by up to 25% compared to previous models. Together with its simple, airless design, the date coder reduces product waste and costs, providing food manufacturers with equipment reliability and performance at a low total cost of ownership.

Equipped with intelligent motion technology and a twin-belt electronic printhead, it does not require any compressed air and provides precise printhead pressure for consistently high-quality prints. Due to the date coder's airless design, there is no more intervention needed by the operator to adjust the air pressure, while the date coder's unique printhead can be changed in less than 30 s, maximising production uptime. In combination with a simple, easy-to-load cassette, this means that the printer requires fewer wearing parts and there is no need for any additional mechanical devices to control ribbon tension, facilitating maintenance and eliminating potential failure points.

Featuring real-time image processing capabilities, the product is able to automatically detect common print defects, including those caused by ribbon creases, overprints or worn print surfaces. Any mismatch between the intended and the captured image will be evaluated on the spot and trigger an alert to minimise waste and reduce downtime.

It was designed to seamlessly integrate into the company's robag series of high-speed vertical form fill and seal packaging systems.

tna solutions Pty Ltd

www.tnasolutions.com

Proseal receives Queen's Award for Enterprise

Tray sealing specialist Proseal UK has received the Queen's Award for Enterprise: International Trade for its continuous growth over the last six years. The prestigious UK business award was presented by the Lord Lieutenant of Cheshire, David Briggs, at a special ceremony held at its headquarters in Adlington, Cheshire.

Proseal designs and manufactures high-quality automatic tray sealing machines, conveyor systems and sealing tools for the food industry and other applications. The event provided the opportunity for a photograph of the first tray sealer the company manufactured, the Proseal PR30, together with Proseal's first customer, David Wright of Kershaw's Frozen Foods.

David Rutley, MP for Macclesfield, said, "I extend my warmest congratulations to all at Proseal on this excellent and well-deserved award. It is clear that staff have made strong and dedicated efforts to expand the business, boosting the local economy and creating many jobs locally. I wish the company every success for the future."

Proseal's Queen's Award for International Trade coincides with the company's 20th anniversary and follows strong sales growth in both its home and export markets, increasing its number of employees from over 300 in the UK to 438 worldwide.

In the last year, this growth has culminated with its best performance in international trade. The Proseal USA and Proseal Australia subsidiary businesses, along with a growing network of



Steve Malone, David Wright, the Proseal PR30 and Robert Hargreaves.

13 distributors, have helped the company gain 52% of sales in export markets in 2017. It also has strong business in mainland European countries such as the Netherlands, Ireland, Germany and Spain, and has developed new markets in Southeast Asia, China, Turkey, North Africa, South Africa and South America.

"It was a wonderful day and such a great honour to receive our Queen's Award from the Lord Lieutenant in front of so many people who have played a key role in Proseal's success over the last 20 years," said Steve Malone, Proseal's Director, who co-founded the business with Robert Hargreaves in 1998. "I wish to thank everyone who came and shared the day with us. People have always been at the heart of Proseal — that's a major reason we won a Queen's Award and it will be major factor in our success in the future as well."



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AIP to run sustainable packaging design training course

The packaging industry is facing increasing demands to meet environmental challenges, and the Australian Institute of Packaging (AIP) will be launching a half-day training course in Melbourne to help businesses address sustainable packaging design.


Held on Wednesday, 17 October, the 'Introduction to Sustainable Packaging Design' course is aimed at anyone who is responsible for a business's packaging design, performance or purchase specification, including packaging designers, packaging technologists and those in environmental strategy development.

Presented by AIP Education Coordinator and experienced food-packaging consultant Ralph Moyle, the course is designed to help businesses answer 'war on waste' questions and address changes to retailer and consumer trends and behaviours.

Attendees will gain a better understanding of the practical guidelines and criteria needed to design and develop sustainable packaging, including the sustainability hierarchy of reduce, re-use then recycle and the circular economy approach to packaging and the environment. It will also educate participants on the current environmental issues that are impacting producers, manufacturers and retailers, and provide best practice examples of sustainable packaging and save food packaging innovations.

Discussions will cover the impact of plastic, glass and metal packaging on the environment and whether the use of non-renewable resources, plant-based bioplastics, compostable and recycled materials, and various tools can assist businesses in understanding the full life of packaging.

Participants will be invited to bring with them a sample of their company's packaging materials to use as a case study.

As part of the course, attendees will also visit a material recovery facility to educate them on what is and is not separated out for possible recycling and expose them to their material handling issues. 

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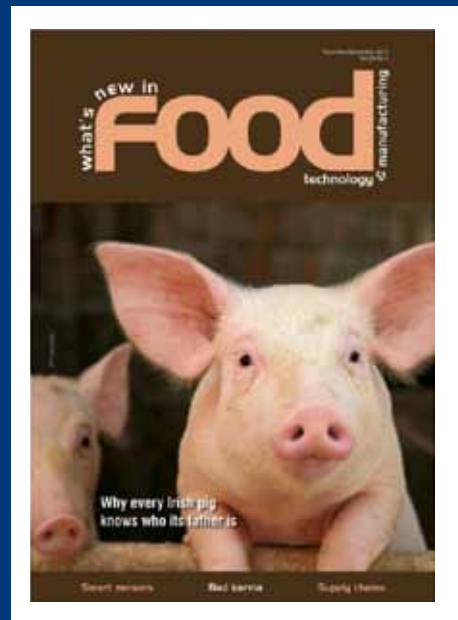
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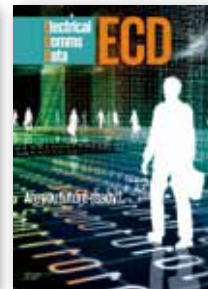
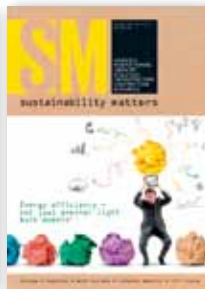
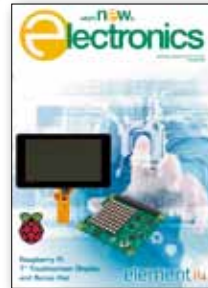
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