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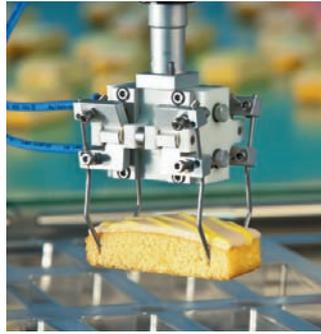
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September/October 2017



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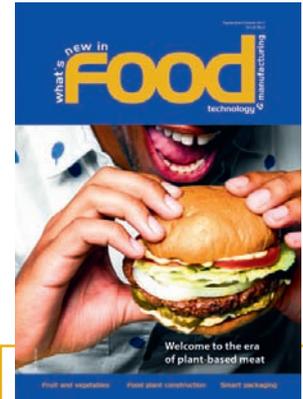
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# What is 'healthy'?

Foods and drinks are regularly labelled as 'healthy'. This isn't because the manufacturer wants consumers to eat a better diet — it is to increase sales of the product.



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I don't have a problem with this — after all consumers aren't idiots and can well judge what they want to purchase. I do believe in honesty in labelling so that when I read a label I can be sure that I know what I am purchasing. But if the packaging is splashed with 'healthy' what does this mean?

The Macquarie dictionary has three meanings: Possessing or enjoying health; Relating to or characteristic of health; or Conducive to health, or healthful.

Well — this doesn't progress my quest to find out what healthy is when it's on my food pack. So what does Macquarie say about 'health'?

- Soundness of body; freedom from disease or ailment
- The general condition of the body or mind with reference to soundness and vigour
- A polite or complimentary wish for a person's health, happiness etc

Getting over the problem that in bullet three the definition of health includes health, the semantics don't explain why putting the word healthy on a label will induce me to buy a product. I guess it all gets back to warm and fuzzy feelings — if it says healthy it must be good for me and better than any products that don't say healthy.

Last May the Institute of Food Technologists (IFT) expressed concern that labelling an individual food as healthy can be misleading for consumers and submitted a definition of healthy to the FDA.

IFT recommended the following:

- A hybrid approach to defining the term healthy. IFT suggested a food-based definition of the word healthy which combines nutrient limits and a statement describing how the food helps achieve dietary recommendations.
- The definition for healthy food should align with the three eating patterns recommended by the 2015–2020 Dietary Guidelines for Americans.

- Foods which exceed the recommended limits for sodium, added sugars and saturated fat should be excluded from being labelled as healthy.
- Foods fortified with essential nutrients should not be excluded from healthy labelling if the fortification is consistent with the FDA's fortification policies and the food contributes to an overall healthy eating pattern.
- Consumer education on changes in labelling is essential to build and maintain consumer trust.

In Australia the state and territory health departments are responsible for enforcing food laws and both the Food Regulations and the Commonwealth Trade Practices Act — administered by the Australian Competition and Consumer Commission (ACCC) — prohibit false and misleading information.

The Australian New Zealand Food Standards Code regulates the use of specific health and nutrient content claims:

- General level health claims refer to a nutrient or substance in a food and its effect on a health function. They must not refer to a serious disease or to a biomarker of a serious disease.
- High level health claims refer to a nutrient or substance in a food and its relationship to a serious disease or to a biomarker of a serious disease.

But 'healthy' in isolation has no legal or formal meaning and the Food Standards Code neither regulates nor defines these loose terms.

I think I'll pop out for a healthy gin and tonic!

Janette Woodhouse  
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## New Horticulture Code: tougher penalties, no exemptions

The revised Horticulture Code, which sets out mandatory requirements for traders and agents operating in Australian fresh fruit and vegetable markets, has now come into effect.

The code requires traders and agents to provide clear documentation of their general trading terms and to have written agreements in place with their farmer clients, to avoid much of the commercial uncertainty that previously existed in these markets.

The revised code also removes the provision in the existing code that exempted all pre-existing trading agreements, and which meant it did not apply to the majority of trade occurring in the sector.

"Farmers producing fruit and vegetables will be given increased protection under the Horticulture Code as it improves competition and commercial practices in fresh fruit and vegetable markets in Australia," ACCC Commissioner Mick Keogh said.

"From 1 April 2018, the code will apply to all transactions between farmers and agents or merchants, regardless of when any trading agreement was put in place. This is a real win for farmers," Keogh said.

The changes provide the Australian Competition and Consumer Commission with new powers to issue infringement notices of \$9000 for businesses and \$1800 for individuals, and seek penalties of up to \$54,000 in court for breaches of certain code provisions.

"Infringement notices will allow the ACCC to quickly deal with conduct it believes breaches the code, while tougher court penalties should provide a stronger deterrent than was the case under the current code," Keogh said.

Keogh said an important and welcome new addition to the code requires negotiating parties to act in good faith, or face potential fines.

"Farmers deserve fairness and honesty from their trading partners and the good faith requirement will help ensure they aren't subjected to illegitimate business conduct," Keogh said.

"The good faith requirement will also bring the Horticulture Code into line with the Food and Grocery and Franchising codes, which have similar provisions."

There is a 12-month transition period to allow the industry time to adapt their existing arrangements to the new code. By 1 April 2018, all existing agreements between farmers and agents/wholesalers must be compliant with the new code. However, any agreement made or renewed after 1 April 2017 must be compliant with the code immediately.

The obligation to act in good faith, along with record-keeping and dispute resolution obligations will also apply immediately from 1 April 2017.

## Corn: biofuel or food?

Renewable biofuels are so environmentally warm and fuzzy. Plant the corn, grow it in the sunshine and fresh air, harvest it and then turn it into ethanol for use as fuel. Really, you can just about hear the birds singing. But is this the most economically and environmentally advantageous way to use corn? How about using corn as a food?

To compare the energy efficiency and environmental impacts of corn production and processing for food and for biofuel, researchers from the University of Illinois inventoried the resources required for corn production and processing, then determined the economic and environmental impact of using these resources — all defined in terms of energy available and expended, and normalised to cost in US dollars.

They found that the net social and economic worth of food corn production in the US is \$1492/ha, whereas biofuel corn production resulted in a \$10/ha loss.

The team assessed the energy required to prepare and maintain the landscape for agricultural production for corn and its conversion to biofuel. Then they quantified the environmental

benefits and impacts in terms of critical zone services, representing the effects on the atmosphere, water quality and corn's societal value, both as food and fuel.

Civil and environmental engineering professor Praveen Kumar and graduate student Meredith Richardson published their findings in the journal *Earth's Future*.

"One of the key factors lies in the soil," Richardson said. "The assessment considered both short-term and long-term effects, such as nutrients and carbon storage in the soil.

"We found that most of the environmental impacts came from soil nutrient fluxes. Soil's role is often overlooked in this type of assessment, and viewing the landscape as a critical zone forces us to include that."

"Using corn as a fuel source seems to be an easy path to renewable energy," said Richard Yuretich, the NSF program director for Critical Zone Observatories. "However, this research shows that the environmental costs are much greater, and the benefits fewer, than using corn for food."





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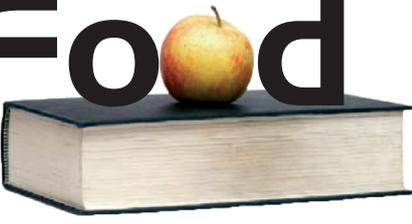
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# Food

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## You don't have to eat food to get fat — just smell it

The smell of food is one of life's pleasures. It is well known that those who lose their sense of smell often lose weight — traditionally it was thought that those unable to smell their food because of age, injury or disease lost weight due to loss of pleasure in eating and depression, which itself can cause loss of appetite.

However, in an interesting experiment at the University of California, Berkeley, more information came to light. Scientists used gene therapy to destroy olfactory neurons in the noses of adult mice but spared the stem cells, so that the animals lost their sense of smell only temporarily — for about three weeks — before the olfactory neurons regrew.

Mice with impaired ability to smell, and their littermates with normal smelling capabilities, were fed identical high-fat diets. Those without a sense of smell stayed slim, while those who could smell became obese. The smell-deficient mice ate the same amount of fatty food as mice that retained their sense of smell but simply did not put on weight. In addition, mice with a boosted sense of smell — super smellers — got even fatter on a high-fat diet than the mice with normal smell.

These results suggest that the odour of what we eat may play an important role in how the body deals with calories. If you can't smell your food, you may burn it rather than store it.

This points to a connection between the olfactory or smell system and regions of the brain that regulate metabolism — in particular, the hypothalamus — though the neural circuits are still unknown.

"This paper is one of the first studies that really shows if we manipulate olfactory inputs we can actually alter how the brain perceives energy balance and how the brain regulates energy balance," said Céline Riera, a former UC Berkeley postdoctoral fellow now at Cedars-Sinai Medical Center in Los Angeles.



## Funding for food start-ups

Applications have opened for the first Australian 'deep technology' agtech program.

'Super incubator' Cicada Innovations and MLA Donor Company (MDC) have developed the GrowLab program in an effort to assist talented agricultural technologists obtain funding for their start-up companies.

The participants will already have a technology that can be applied to the agriculture or food sectors, and GrowLab will provide the tools, structure and milestones to determine how best this technology could be turned into a start-up company.

It is the only agtech program in Australia focused on deep technologies that go beyond simple mobile applications, and will comprise eight to 10 individuals or teams with ideas capable of completely transforming agricultural practices and food production.

"The opportunities in agricultural technology are absolutely huge in Australia at the moment, and are expected to contribute over \$189 billion between 2013 and 2022," said Petra Andrén, CEO of Cicada Innovations.

"We have a great deal of talented researchers and scientists already working in these sectors who are finding solutions. Through GrowLab, we can assist in taking their research or discovery to the next level.

"For food production in Australia, for example, we know it can be impacted by seasons or extreme weather and by addressing these we could be capturing a massive financial and productivity opportunity for the industry. Ultimately, we are looking for eligible projects that are pre-farmgate, post-farmgate, food technologies or food innovations."

The program will commence in September, running until November, and involve one day per week of training over the 12 weeks. This will culminate in a public showcase and investor pitch where promising businesses can receive the necessary investment to progress.

By the end of the program participants will have developed a business model validated by customers and backed by the critical structural knowledge about how to set up a start-up company, provided alongside the business model development components.

## New CEO for AFGC

Replacing the acting Australian Food and Grocery Council (AFGC) CEO Geoffrey Annison, Tanya Barden has been announced as the body's new CEO, commencing 3 July.

The appointment is internal, with Barden currently the body's director of economics and sustainability. Barden's background also includes stints at the ACCC, ActewAGL and managing her own online food business.

With Australia's food and grocery turnover coming in at around \$125 billion each year, Barden's role is not one to be taken lightly.

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# Making green claims with confidence

Anthony Peyton\*

There's a plethora of certification schemes that provide insurance for product claims, such as for: palm oil, sustainable fisheries, fair trade coffee and sustainable forestry — but packaging hasn't had standardised evidence-based schemes.

**M**arketers know green claims can help to sell products yet such claims rarely come across with confidence and vigour. How can this hesitation be fixed?

Marketers need to be convinced that product and packaging developers have taken out insurance.

The term 'sustainable packaging' has been championed for over a decade by the Australian Packaging Covenant (APC) and the Packaging Council of New Zealand (PAC.NZ). Member organisations can conduct qualitative assessments of packaging through the adoption of APC's Sustainable Design Guidelines or PAC.NZ's Code of Practice.

Design assessments can be supported by laboratory testing and field trials to provide quantified results, although these can be expensive and time consuming.

Fortunately, sustainability assessment tools are now available that simulate the life cycle and end-of-life fate of packaging so marketers have access to evidence for the sustainability claims.

Since its launch in November 2015, eight businesses have partnered with Planet Ark to apply the Australian Recycling Label to their packaging and have done so confidently using an assessment tool called PREP that simulates a materials recovery facility (MRF) and downstream reprocessing operations.

Another example is EcodEX, a screening life cycle assessment tool developed over the past three years by Selerant in association with Nestlé. LCA tools such as this one allow designers to simulate the life cycle of products and packaging to forecast the environmental impacts and present comparative reports for decision-making and to support sustainability claims.

## EcodEX

EcodEX is an eco-design software tool certified to the international series of environmental standards ISO 14040-14044.

It is used by food and beverage companies to complete a thorough assessment of their packaging and the contained product. They are able to gauge the sustainability of a product based on such things as carbon footprint, water use, energy use and land use, and designers can then communicate these attributes on pack.

Developed by Selerant in association with Nestlé, a developer



of Product Lifecycle Management software, EcodEX can be integrated with other software to further streamline assessments. EcodEX is one of the products marketed by Empauer.

## PREP

PREP was launched in 2014 by GreenChip and Planet Ark with the support of the Australian Packaging Covenant, the recycling industry and local councils.

The software complements EcodEX and other LCA tools by simulating packaging's end of life when disposed at kerbside. The PREP ensures an effective approach to the end-to-end recycling capability of many businesses including: Nestlé,

Plantic, Pro-Pac Packaging, Sealed Air, Woolworths, Ecostore, Pioneer Electronics and Henschke.

PREP is positioned as the missing link between materials production and recycling plant processes. In 2016, PREP was extended to allow the recyclability of packaging to also be assessed for the New Zealand market.

## ARL

The Australasian Recycling Label provides on-pack instructions to reduce consumer confusion when determining "which bin does it go in?".

Launched in 2015 by Planet Ark, the label has been adopted by leading organisations including Officeworks, Blackmores, T2 Tea, Planet Ark Paper, Australia Post, Combe Asia Pacific and on products sold by Plantic.

These brands have adopted the ARL with confidence and vigour, knowing the claims are based on PREP Assessments.

In order to reverse the alarming trends associated with climate change, species loss and water and resource scarcity, businesses need to double their efforts to produce more sustainable packaging and products — so why not do this with confidence and vigour?

\*Anthony Peyton, MAIP is Director of GreenChip environmental advisers specialising in sustainable packaging assessment and design, food waste prevention and carbon accounting. He is also the PREP Program Manager and the Southern Director – Victorian Chair for the AIP.

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# Safe, efficient, smart and sustainable

## Modern food packaging

Melanie Streich

*Bakery goods are gently packaged with special grippers.*

**Packaging was once there simply to protect the contents, but modern packaging can do a lot more than this. Modern packages can think for themselves, remind us, extend shelf life, be heated at the press of a button and influence our senses with their appearance, odour and feel. Some of them can even speak.**

**A**longside all of these new functions, packaging also has to meet the needs of marketing and sales, comply with safety and hygiene regulations, and satisfy such consumer requirements as sustainability and easier handling while keeping the cost of production, transport and storage low. It is thanks to the latest machines with highly automated sensor- and microprocessor-controlled drive technology, coupled with innovative materials that can be produced and disposed of sustainably, that the packaging industry has succeeded in converting a 6000-year-old idea into a modern high-tech product.

### **First and foremost: protection due to packaging**

The primary purpose of each package — that of protecting its contents during transport and storage — remains unchanged. Packages prevent contamination and damage and protect foods from harmful environmental influences such as light, oxygen and moisture. They provide protection from spoilage due to microorganisms and prevent the loss of flavour or vitamins.

Up to 1.3 billion tonnes of foods, says the Food and Agriculture Organisation of the United Nations, are lost each year worldwide. In some cases, fresh goods spoil during transport, are not consumed in time or are deemed unsaleable because they fall short of the given standards. And often enough, still-edible food is discarded by consumers because the sell-by date has expired.

For over six years now, this overall issue has been addressed by the SAVE FOOD initiative of the FAO, the environmental program of the United Nations Environment Programme (UNEP) and Messe Düsseldorf in cooperation with globally leading companies, organisations and research institutes. Their joint goal is to devise solutions to prevent food loss and wastage along the value chain. This involves making suitable infrastructure available, re-examining and modifying standards for packaging, raising awareness and, last but not least, working on the package itself.

### **Hygiene's not everything, but food is nothing without hygiene**

When it comes to food packaging, hygiene is top priority. The packaging of sensitive meat and sausage products must be subject to extreme standards of hygiene. With complete high-performance production lines including meat grinders, portioners and tray-sealing units, focus must not only be on performance, flexibility and product quality, but also on the interfaces between the individual components — because these have a huge bearing on productivity.

The responsibility for food safety lies with the manufacturer itself. In-plant hygiene controls are strongly advised, but even more important is the exclusion of possible hygiene traps from the outset. Covering everything from comprehensive hygiene design and effortlessly cleanable components to sterilisation



*A product's shelf life can be extended significantly by vacuum skin packaging.*

Photo courtesy Sealpac

of the ambient air with shortwave UV radiation, highly advanced equipment delivers the highest standards of hygiene.

In the case-ready sector particularly, the skin pack — a two-component case-ready package consisting of a PP or CPET tray sealed with a skin film — has become increasingly prominent. “It’s possible to extend product shelf life considerably with vacuum skin packaging,” explained Stefan Dangel, sales and marketing manager at Sealpac.

### Intelligent packaging

The innovative powers of the packaging industry are remarkable. Anyone investigating the very latest packaging technologies cannot fail to encounter nanotechnology, as well as printed and organic electronics. Intelligent and smart wrappers that are capable of identifying and affecting the degree of food freshness in a controlled fashion are now anything but utopian.

Active packages control the moisture level, prevent the proliferation of germs and even kill them — by using absorbers, for instance. Iron keeps oxygen-sensitive beverages like beer or juice fresh for longer. Table salt in the package inhibits the formation of condensation and enables mushrooms, for example, that tend to discolour after a short while, to look good for longer. “The idea was to develop a package that can take up and regulate moisture,” said Dr Cornelia Stramm of the Fraunhofer Institute for Process Engineering and Packaging IVV in Freising, explaining the aim of the research project.

### Visibly fresh

Whether food is still edible can be rendered visible by the special sensors of modern packages. These react when certain substances or gases are released and indicate this with a change in colour and fluorescence. The state of the food is then evident at a glance. One of the most frequent causes of food spoilage is breaks in the cooling chain. Intelligent time-temperature indicators are capable of indicating such discontinuities, usually with a colour change.

### Packaged 4.0

In addition to consumer expectations, the packaging industry is also exposed to the growing requirements of its customers. Responding to the desire for greater flexibility and efficiency, the sector reacts with an intelligent and interlinked factory in which classical mechanical engineering efficiently networks with sensors, software and services.

“The innovative powers of the packaging industry are remarkable.”

Industry 4.0 has long become the standard in the food industry and is closely associated with the component industry, which can be seen as blazing the trail of technological progress.

Modern lines are capable of not only autonomously supplying information on process and system states, but also communicating with each other and independently correcting processes where necessary. “Intelligent products then individually control their own production process. And this is not all: thanks to communication throughout the value chain, a product’s life cycle becomes continuously traceable. Totally new business models are possible,” explained Hartmut Rauhen, deputy executive director of Germany’s Mechanical Engineering Industry Association (VDMA).

A pioneer in the use of such progressive technologies is Bosch Packaging Technology, which is planning to equip all new process and packaging machines with its next-generation Human-Machine Interface (HMI) 4.0 as of interpack in May 2017. One of the new features is guided intuitive operation with multitouch technology — much like on smartphones and tablet computers. The system reports malfunctions immediately and, in addition, provides information on the possible cause and assistance with remedying the problem. “This is a revolutionary innovation,” said Stefan König, member of executive management at Bosch Packaging Technology.

Packaging is indispensable for modern society. This applies especially to foods and becomes apparent above all where it is lacking — in developing countries. Food often spoils due to the lack or inadequacy of packaging for transport and storage before it reaches the consumer. In industrialised nations, on the other hand, a package not only has to protect, but it has to look good as well. And it has to stand out on the overloaded supermarket shelves, because the majority of customers only decide while shopping which product actually lands in the basket.

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## Question time ...



### What are the top 5 considerations when buying a date coder?

Choosing a date coder can be confusing. So how do you make sure you have the right technology? Each manufacturer has unique requirements, but there are a few basics that everyone should consider; otherwise you're setting yourself up for issues. Firstly, clearly define your needs. This quick Q&A is a great way to start.

**Q. What are you printing?**

A. A use-by date on primary packaging? Batch codes on secondary packaging? Multiple different message types? Clearly outline everything you need to print.

**Q. What are you printing onto?**

A. Cardboard, wet glass, plastic, film, wood, cloth ... every substrate has different properties, which affects the way a code is printed. Lasers are popular across many industries (e.g. beverages, pharmaceuticals, snack foods), because they offer a very fast way to print high-quality, permanent codes on almost any substrate, such as glass, plastics, metal and cardboard.

**Q. What is your line speed?**

A. Production line speed determines your date coder's required capability. Continuous inkjet printers (CIJs) have the advantage of being able to clearly mark on most packaging substrates even at very high production speeds. They are also easily integrated on to a conveyor production line.

**Q. What is your factory environment?**

A. Is your factory dusty, wet or cold? Some manufacturing environments can be challenging for technology. Choosing a date coder that's built to withstand your environment will ensure longer use and greater reliability.

**Q. What are your future plans?**

A. Always think about your future needs. Are you expecting to grow, print on different substrates, introduce new SKUs or print different messages? Each of these will impact your date-coding needs.

**Q. What do I do now?**

A. Thinking about running costs will help determine the date coder with the best ROI for you. Consider your factory's current technology: can the date coder easily integrate with minimum disruption to your production line? Do your team need additional training? What kind of support does the equipment provider offer? It is critical to choose one with local maintenance teams who have the skills and resources to install, service and fix the date coder should anything go wrong.

**Q. I'm after labelling equipment, not a date coder.**

A. Perfect; these same basic points above also apply.

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### Automatic sleeve and label applicator

The Herma Sleeve and Label Combination Applicator can manage application and direct variable printing of wraparound sleeves as well as top, bottom and top-bottom combination labels.



Trays, including rigid, semi-rigid and thermoformed film-based type products, can all be labelled through the Herma 652ES Labelling system. This means manufacturers can set up combination lines and standardise on machinery.

Using the Herma 400 Servo Driven label head, the heart of every Herma labelling system, the Herma 652ES can apply labels or sleeves with high accuracy and deliver a consistent labelling result every time with virtually no operator intervention. It's a set-and-go system with label roll change the only touch point on the system.

Developed specifically for the Australian market, the system is able to be coupled with a scale and metal detector so the sleeves and labels not only include the exact weight of each individual pack, they can include the retail price based on the preset price per kilo. The electronic weight functionality also results in the automatic rejection of packs outside of spec. So if a pack is under or overweight it is not output as production. This functionality is all controlled by one simple-to-use HMI, and if required, connection to a manufacturer's ERP software for automated population of product information.

The HERMA 652ES Meat Tray Label and Sleeve Applicator prints both barcodes and QR codes on the labels — suitable for traceability platforms like IDlocate and multilingual labelling for export markets.

**Result Group**

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

### Lid replenishment system

Robust and efficient, the Fibre King Lidder forms and applies a lid to a full meat tray and runs multiple lid types through a single machine. At any one time, a meat facility can pack product into a number of different trays, which are then sent randomly through to the Fibre King Lidder for lid application before storage.

The Lid Replenishment Package (LRP) was recently introduced so that users could replenish the magazine or change a lid batch without stopping the machine. Being able to load blanks while the machine is still running prevents any chance of full trays backing up and line stoppages, whether it be the boning room or freezer exit. With the average re-load time being around 10 min, with up to six reloads/day, this increases uptime by 1 h/day.



**Fibre King Pty Ltd**

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

## X-ray detection system

Physical contaminants such as metal, glass or stone found in food compromise consumer safety and can be damaging to a manufacturer's brand.

The Thermo Scientific NextGuard X-ray detection system is sensitive and easy to use, and meets a broad range of food safety and quality requirements. It makes X-ray detection and the ability to evaluate and adjust operation on the go easy. It can also inspect packaged products for missing components, underfills and overfills, and other quality problems with easily customisable vision software.

The product enables users to inspect any type of packaged, bulk or piped product. It has options for product handling, rejection and application-specific inspections, as well as models for extreme washdown. It also has software for contaminant detection, mass measurement, fill level, product integrity (missing/broken product) and many other inspection tasks. Customised software is available.

The product has easy-to-use, touchscreen-driven systems for quick set-up, product changeover, record storage and root cause determination.

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



## Interface to integrate downstream processes

The Connex interface by Kautex Maschinenbau plays an integral role in the IntelliGate integration system. It is used to integrate downstream processes such as quality control processes into the machines. Individual modules can be incorporated with machines in the series and connected via the interface using plug and play, providing customers with a complete integrated production process from one single source.

All connected modules are supplied with compressed air and power and it guarantees a standardised data exchange, according to the company. Users have the flexibility to respond to changes in the production sequence, eg, by allowing them to exchange the modules of existing machines from the company. The need for additional power supply or compressed air connections is eliminated. The interface not only recognises every module, but also the order of modules, even if changes are made to their arrangement.

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## Carola increases output speed by 3000 bottles/h following three-week line upgrade

One of the largest producers of mineral water in France, Carola, is producing a lighter PET bottle and, in doing so, has also increased output speed by 3000 containers/h. It follows a line upgrade by Gebo Cermex, with installation and ramp-up to full-speed production achieved in less than three weeks.

Following the buy-out of the Carola by Spadel, the international group focused on the bottling and marketing of natural mineral waters and a varied range of refreshing drinks, which called for a complete overhaul of the Ribeauvillé PET line facility, in Alsace (France). The ageing line was causing problems because of its limited flexibility, restricted accumulation capacity, reduced speed due to the limitations of certain machines within the line and poor working conditions. More importantly, the performance of the line was preventing Carola from keeping pace with the fast-changing beverage market and the fluctuations in consumer demand. The company was also eager to minimise the weight of the bottles it was producing and to switch to more modern packaging formats. The new owners' investment strategy included a plan for the reduction of production costs.

Gebo Cermex was selected to undertake the modernisation work following the success of a project previously executed at Carola. Thierry Klein, director of production maintenance at Carola-Ribeauvillé, explained: "We have tested Gebo Cermex capabilities around a returnable glass line and we have been especially impressed by their expertise in line automation and project management. That positive experience convinced us to trust the company again for this upgrade, because we knew their skills would be priceless for our new PET line."

Within this type of installation, which covers everything from bottle conveyors right through to the palletiser, the connection between the line's various pieces of equipment is vitally important. Output performance is largely determined by the efficiency with which the line handles increases in speed as well as stoppages.

The project at the Carola-Ribeauvillé factory presented the team in Gebo Cermex with several other challenges. On one hand, the company had to change everything within a complete production line without creating a supply problem for the water producer. This meant that Gebo Cermex had to replace all the equipment and get the entire line back in operation at full speed in all formats in no more than 21 days. On the other hand, the customer had to upgrade the line, taking up no more room in a facility where floor space was already at a premium.

José Lefort, industrial manager at Carola-Ribeauvillé, commented: "It's clear that this project has been a success. It's more than lived up to our expectations. The line productivity



target has been met — and speed and line regulation have been optimised for all packaging formats."

The new line has increased output rates by 3000 bottles/h for all packs' formats. This increased productivity means that Carola can now produce greater volumes to tighter deadlines, enabling the company to respond to spikes in demand while reducing the stock managed for this purpose by an external storage provider. Lefort continued: "Increasing output speeds by around 3000 bottles/h for all formats has allowed us to switch to two, eight-hour shifts — with barely any production now taking place at night."

The most crucial stage of the project, the dismantling of the existing line and the assembly of the new equipment, took place well within schedule and the restart proved successful for all formats, which now includes packs of 6, 8 and 24 bottles. Production speed was quickly ramped up and within a month the whole line was running at 75% line efficiency. All the machines and conveyors were reinstalled as close as possible to the ground so that they were directly accessible with no need to climb up on walkways — unlike the previous line. Line control is one of the major strengths of the new system, not least the advanced management of stoppages and restarts on the conveyors and the accumulation tables between the machines. Format changeovers on the new line are also much more efficient than they used to be.

Lefort concluded: "We've had no problems at all. Thanks to this project, we've been able to introduce a new and lighter bottle design. All the new bottles are perfectly stable on the conveyors. That meant that we were able to deliver our clients' orders without interruption — while offering them new packaging options."

**Gebo Cermex at Tetra Pak Marketing Pty Ltd**  
[www.gebocermex.com](http://www.gebocermex.com)

## PET recycling solution

Bühler has introduced a PET recycling solution that is capable of improving yields by more than 30%, according to the company, whose strategic partnership with US-based National Recovery Technologies (NRT) provides plastics recyclers with a complete solution for plastic bottle and flake sorting.

The innovative, two-machine process solution delivers bottle-to-bottle grade rPET flakes. The process is based on two technologies — offering colour sorting as well as sorting by chemical signatures — that can identify invisible and same-colour polymers. The result is high-grade rPET flakes for bottle production, plus a significant increase in yield.

**Buhler AG Australia NZ**  
[www.buhlergroup.com](http://www.buhlergroup.com)

## Automatic film reel changeovers

The Advanced series by KHS enables automatic changeovers from one reel to the next on its packaging machinery. The film storage facility means it is no longer necessary to stop the machine or throttle the production speed.

With a machine stop of up to 21 s/reel, change up to 1.2% more capacity can be achieved per year in two-shift operation, the company claims. This efficiency is brought about by a built-in buffer; once the current reel of film has been unraveled to a certain minimum, the storage facility is automatically filled parallel to production.

The switch is triggered by a sensor that scans the diameter of the active film reel and recognises when a change of reel is imminent. Once the store has been filled and the active reel reduced to the absolute minimum, with clear film the drive stops directly and not at a defined position. With printed film it stops right at the eye mark.

The size of the storage facility and the short time needed for film splicing mean there is enough cooling time, thus creating a stable splicing seam. This function can also be retrofitted on existing systems to process shrink film. Adaptations to the machine control system and, depending on the machine version, mechanical and/or electrical conversions are required for operation. There is no need for special electronic components or a separate controller.

**KHS Pacific Pty Ltd**  
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# Meet Alex Fileczki — Australia's latest CPP



Alex Fileczki is the latest Australian packaging professional to attain the Certified Packaging Professional (CPP) designation.

PACKAGING

## How long have you been in the industry? What are your areas of expertise?

I have been working in FMCG for nearly 15 years. My roles have included engineering project management and maintenance management (on both utilities and packaging equipment). For the last three years I have been a part of Clover's Development Engineering Department. We are responsible for providing engineering assistance and guidance to the business (working closely with packaging development) for all new products and projects. We are also responsible for standard equipment designs and the specification of new equipment. My area of specialisation is packaging equipment.

## What made you apply for the Certified Packaging Professional designation?

I was looking for an internationally recognised packaging certification that would help with day-to-day work and improve my ability to assist our Packaging Development Department.

## How important is attaining the CPP designation to you as an individual?

The importance for me lies in the fact that the CPP certification allows people in industry to see that I have an extensive understanding of packaging. I believe that the CPD element of the certification will ensure that I personally ensure the continued development of my packaging knowledge and also that I keep up with new developments and trends within the packaging world.

## How important is the CPP designation for the greater recognition of packaging professionals?

I think that since the CPP certification is internationally recognised and well managed, it means that industry can use it as a reliable benchmark of an individual's packaging knowledge.

## A bit about CPP certification

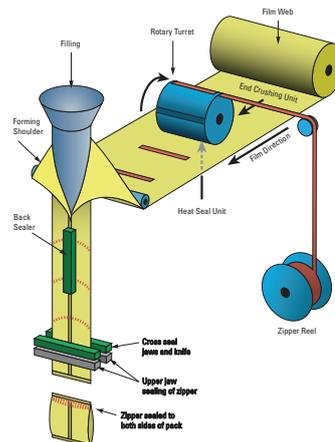
The Certified Packaging Professional credential demonstrates that a packaging practitioner possesses packaging knowledge, experience and skills to the degree that they deserve recognition as a true packaging professional.

Attaining the CPP designation is an excellent investment in your professional development and the credential defines the packaging professional and allows organisations to seek out and hire the right professional based on verified knowledge, skills and industry contributions. Using the CPP program to assess and evaluate one's professional competency validates you as internationally proficient as a packaging professional. The Certified Packaging Professional (CPP) designation is a registered trademark of the Institute of Packaging Professionals (IoPP) and is now internationally recognised by IoPP, AIP and the WPO.

For more information on the Certified Packaging Professional (CPP) program, please email [educate@aipack.com.au](mailto:educate@aipack.com.au) or visit [aipack.com.au/education/certified-packaging-professional-cpp/](http://aipack.com.au/education/certified-packaging-professional-cpp/).

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# Aokin and Pathtech

## First Choice in Food and Pharmaceutical Science

**Aokin has entered into a collaboration with Australian based Pathtech Pty Ltd to offer their food testing platform to Asia-Pacific food laboratories. Aokin offers innovative analytical systems based on rapid and sensitive fluorescence polarization analysis technology for the food, antibody, pharmaceutical, enzyme, and medical diagnostic markets.**

Pathtech believes that the Aokin range will allow Australian food and pharmaceutical producers to minimise mycotoxin contamination in their facilities, raw materials and final products. It will also allow Australian food and pharmaceutical producers to measure caffeine in their products. In addition, the Aokin range fits well alongside Pathtech's range of drug detection systems, offering a monitoring solution for medicinal cannabis, allowing hemp producers to monitor cannabinoid levels (THC and CBD) in their raw materials as well as intermediate and finished products.

"We are confident that Pathtech's knowledge of the Australian food, animal feed and growing medicinal cannabis markets will enable both of our companies to provide Australian clients with Aokin's rapid assay systems. Australia is an exciting and challenging market and one which Aokin is proud to be part of. We know that having a highly qualified distributor such as Pathtech, will enable us to provide excellent local support for the Australian market.", said Dr. Ursula Dahmen-Levison, CEO of Aokin AG.

"Our relationship with Aokin ties together many of our existing ranges, allowing Pathtech to offer a complete solution for Food and Pharmaceutical sciences, including distillation and other equipment from Buchi Glas Uster, laboratory equipment from Sartorius and Benchmark Scientific, as well as our range of wine and beer test kits from Unitech Scientific. In addition, the option to perform THC and CBD analysis on medical cannabis and hemp products, provides an interface with our Drug Detection portfolio" said Ms. Sarah Dower, National Sales Manager, Pathtech Pty Ltd. Aokin complements the Pathtech scientific range offering rapid options for mycotoxin, caffeine, THC and CBD analysis in both raw materials and finished products. The Aokin range is expanding and will continue to provide Australian food and pharmaceutical companies with a rapid analytical option at a fraction of the cost of some other analytical platforms and is ideally suited for busy labs whose staff have limited analytical experience.

Aokin's analytical systems are based on fluorescence intensity and polarization which have been used for many decades for the investigation of many biochemical systems, including protein-protein, protein-ligand and protein-DNA interactions. Traditional fluorescence analytical systems deploy only a small fraction of the available information – particularly the information at equilibrium or at fixed time points. The rapid kinetic assay technology instead utilizes the complete reaction time obtaining a 3-dimensional analysis of the available data. The usage of the additional information of this third dimension – time – allows a very precise and robust way of determining concentrations.

Rapid kinetic assays are based on determining the reaction kinetic of an analyte with a specific antibody or receptor. The reaction takes place in solution with the polarized fluorescent intensity being measured.

In sharp contrast to other conventional immunoassays, the Aokin method allows singlicate testing without the need for repetitive use of standards. This in turn allows a wider and a more flexible application range. On this technological basis, a new generation of immunoassays have been developed at Aokin, which are notably distinguished by their speed and simplicity. These homogeneous assays utilize a simple mix-and-read technology. Immobilization and wash steps are unnecessary, leading to faster assay times



**For more information about Aokin, contact our team on 1800 069 161  
or visit [www.pathtech.com.au/foodscience/](http://www.pathtech.com.au/foodscience/)**

**Contact the Pathtech team**  
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# Food profiling: the analytics of authenticity



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The quality of the raw materials and semi-finished products is a critical aspect of the procurement chain of the food industry. To check the authenticity based on the accompanying paperwork alone is a risky undertaking. Mixtures can happen by mistake in the globalised trade, but can also be the work of fakers. Modern methods of food profiling can provide security for processors and consumers.

Is it actually real strawberry jam? And do the fruits originate from Queensland as the supplier promised? Authenticity is not only important to the consumer but also to the food producer — after all, the buck stops with her/him and s/he has to be sure that what is printed on the label and advertised is what s/he is supplying.

Classic analytical techniques are great for determining the fruit and sugar content of the jam but not the provenance of the ingredients.

## Enter the isotope cosmos

At every place on the globe the mix of the stable isotopes is different. These isotope patterns can be used to identify the source of products. If the product contains water the geographi-



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“ In the face of constantly growing demands, scientists are continually working on new opportunities that give more detailed insight into the composition of food. ”

cal isotope pattern of the hydrogen and oxygen will enable the precise identification of the origin of the product. The isotope signatures nitrogen and sulfur reflect the soil where a product was grown. Each region has its own individual isotopic composition — a comparison per database can reveal whether the strawberries in the jam came from Queensland or Korea.

The isotope fingerprint of products can be determined using mass spectrometers.

This technology has been complemented recently by magnetic resonance spectroscopy (nuclear magnetic resonance, NMR), which has established itself as a method for routine use. It enables both targeted and non-targeted analyses to be carried out.

NMR demonstrates its strengths when a multitude of data is necessary for an authenticity evaluation. The multimarker method enables known, unexpected as well as hitherto unknown falsifications to be recognised. For example, with fruit juice more than 30 substances are decisive for its evaluation. The evaluation is based on regularly updated databases with over 16,000 reference juices that are sourced from all over the globe. Deviations indicate problems that are characteristic, for example, for the adding of sugar or for pesticide contaminations. The classification enables similar types of fruit such as oranges, blood oranges and mandarins to be differentiated. And that is not all: the software can determine the geographical origin as well as the difference between direct juice and diluted juice.

### Foodomics

In the face of constantly growing demands, scientists are continually working on new opportunities that give more detailed insight into the composition of food. The latest example of this is the analytic instruments that are bundled under the term foodomics. The system-wide approach not only encompasses the clear identification of the raw materials implemented, but also the determination of origin by exogenous factors.

Metabolomics is one of the technologies these instruments use. The focus lies on the characterisation of the so-called metabolome. This means the entirety of the low molecular compounds that are contained in a foodstuff. In addition to the animal and vegetable metabolites, these include residues and contaminants as well as substances that are generated during the processing.

The aim of one of the projects sponsored by the Federal Ministry of Food and Agriculture in Germany is to determine the origin and authenticity of foodstuffs using non-targeted metabolomic analysis. The non-targeted approach allows a relative quantification of all reproducible, recordable metabolites. To this end, NMR methods are coupled with other methods such as the time-of-flight mass spectrometry and evaluated using gas and high pressure liquid chromatography.

“Basically we compare the molecular, nanoscale fingerprints of the substances and processes in foodstuffs with known references,” explained Prof. Dr Markus Fischer, director of the Institute for Food Chemicals at Hamburg University. The statement illustrates the high demand of the methodology and gives an indication of the potential it holds. Already small differences in the metabolome suffice to be able to come to conclusions regarding the type, the origin or the processing.

Food manufacturers who want to protect the integrity of their brands will find a comprehensive palette of solutions at Anuga FoodTec from 20 to 23 March. The exhibiting companies will not only impress with cutting-edge laboratory equipment at the Cologne fairgrounds, but also with a comprehensive offer of services.

Further information is available at: <http://www.global-competence.net/food/>.



## Food safety IoT device

The PAR SureCheck Advantage is a handheld food safety IoT solution designed for food quality and task management. The product features the latest in Intel architecture, allowing for the integration of multiple functions in an all-in-one handheld device.

The unit provides increased operational efficiencies with its integrated temperature probe, barcode scanner and RFID infrared temperature readers. It ensures hazard analysis and critical control points (HACCP) compliance and has been shown to improve operational efficiencies by 60% compared to traditional pencil and paper, according to the company.

Suitable applications include grocery stores, restaurants, convenience stores, food distribution and food manufacturing.

**ParTech**

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

## Moisture control in cookie production

Mettler-Toledo has developed an expert package entitled 'Moisture in Cookies' which addresses the benefits of reliable moisture control in cookie production.

The free, downloadable package, includes a case study called 'Cookie Quality: A Recipe for Success', which reveals how a cookie manufacturing giant applies moisture analysis to ensure consistent quality, promote operational efficiency and improve profits.

Also included in the package is an application note: 'Measuring Moisture in Cookies', which demonstrates how Mettler-Toledo halogen moisture analysers advance productivity by delivering fast and precise moisture results.

The final element of the package details the company's collection of drying methods for 20 of the most common food ingredients and products.

**Mettler-Toledo Ltd**

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### Lupin test kits

Arrow Scientific has added lupin to its extensive range of allergen test kits that can be used for testing ingredients, food contact surfaces and equipment or final products. The kits will help food manufacturers to ensure that they meet their label claims and avoid market-damaging recalls.

Two versions are available: one measures the level of allergen using a chemistry method and equipment, while the other is a simpler test that only takes about 10 min to perform without special equipment.

**Arrow Scientific**

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



### Coffee spectrophotometer

The HunterLab ColorFlex coffee spectrophotometer measures the colour of ground-roasted coffee beans and provides the roaster with information on the colour and quality of green beans, ensuring a high-quality end product.

Lacking universal grading standards, specialty coffee roasters often perform their own quality assessments, relying on time-consuming manual inspection. The ColorFlex device offers rapid and non-destructive colour assessment, removing the need for sorting and associated visual inspection imprecision. The spectrophotometer measures colour to facilitate more precise sorting and to enhance consistency.

Quality assessment of green coffee beans commences with visual inspection, which is subjective. The same visually inspected samples can be measured by the ColorFlex coffee spectrophotometer to provide numerically objective results. These results can be stored and used to establish standards, tolerances, comparison of batch to standard and variations batch to batch, for each species and geographical origin of the beans and their blends.

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## Applications for particle size analyser and counter

Particle & Surface Sciences' POLA 2000 has been modified to include extra applications.

The system is manufactured, sold and serviced in Australia and distributed throughout the world. Applications for the system are aqueous fluids, used oils, powders, cement, algae, and pharmaceutical and biological products for research and industrial organisations.



The instrument comes in two configurations: the Particle Size Analyser and the Particle Count Analyser. The size analyser features include: size range of 0.5 to 350 µm; up to 1000 user-selectable size channels;

results can be displayed by both population and volume in either graphical or tabular formats; and calibrated with NIST traceable latex standards. The count analyser features include: calibrated to required standards ISO11171; reporting (ISO4406) or SAE AS4059 Standard for Hydraulic Fluids; constant pump speed regardless of viscosity; and the resolution can be selected by the user.

The system features its own carry handle, a dedicated laptop computer and Windows Software.

**Particle & Surface Sciences Pty Ltd**  
[www.pss.us.net](http://www.pss.us.net)

## Salmonella detection kit

The Bio-Rad iQ-Check *Salmonella II* PCR Detection Kit is based on the fast, sensitive technology of real-time PCR. The kit is intended for detecting



*Salmonella* spp. in animal feed and environmental samples, as well as in food samples such as poultry, eggs and raw meats.

Due to the sensitivity and specificity of PCR, results can be obtained in little as 12 h for raw meat samples and in 20 h for all other samples following a single enrichment in a non-selective medium.

The kit uses an optimised system of primers and probes to ensure high specificity and eliminate cross-reactions. It is designed as a multiplex reaction that includes an internal inhibition control that is amplified in parallel with the target DNA for the correct result.

Developed as an open and flexible system, the kit can be used for up to 94 samples. Reactions can be run on low- or high-throughput Bio-Rad instruments, depending on the laboratory's needs. Different iQ-Check assays can be run in parallel on the same plate.

The kit's protocol has been validated by several certification bodies, with validation studies showing that the kit is equivalent to or better than the various reference methods evaluated and that it provides results in much less time.

**Bio-Rad Laboratories Pty Ltd**  
[www.bio-rad.com](http://www.bio-rad.com)

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**Cell Biosciences**

## Identifying and assessing

# risks of contaminants in food



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**U**ndesirable substances such as dioxins, mineral oils and perfluorinated substances can be present in foods along with the desired nutrients, and these substances can affect the health of consumers

To protect human health, it is imperative that the levels of contaminants in foods be reduced to toxicologically acceptable values or minimised as much as technologically feasible. Just because a substance is in a food does not automatically mean that a health risk exists, but as environmental conditions, industrial manufacturing processes and human food consumption habits constantly change, we should constantly update our understanding of the risks posed by contaminants in food.

“Our planet can be regarded as a virtually closed system. Whatever we produce and release into the environment, we will be able to detect after a given time delay — perhaps only in small traces — in foods and human samples,” explained Professor Dr Reiner Wittkowski, vice-president of the German Federal Institute for Risk Assessment. “Far-sighted approaches for identifying new risks have to be developed so that we don’t have to play catch-up.”

Contaminants are substances that are not added to foods intentionally. Such substances can find their way into foods during various stages of production, processing and transport, or as a result of environmental influences.

The state of scientific knowledge on certain contaminants is extensive regarding their origin, properties, hazard potential and exposure, as well as the knowledge derived from this regarding the possibilities for minimising levels in foods. Since the 1980s, for example, measures have been taken to vastly reduce the entry of dioxins into the environment and thereby into food, in order to protect humans and the environment. As a result, there has been a significant decline in the intake of dioxins in the past decades.

The success of the measures taken can be seen in the levels present in human milk as an indicator for the human body burden, where levels of dioxins have dropped to roughly 20% of the original level over the last 30 years. The effective and practice-orientated regulation of contaminants can thus lead to a long-term decrease of levels in the environment and therefore in the human body.

Regarding other substances, such as per- and polyfluorinated alkylated substances (PFAS), there is a greater need for research and action. PFAS are industrial chemicals that are difficult to degrade and can be detected virtually everywhere — in the environment, in the food chain and in humans. Due to their special technical properties, they are used in numerous industrial processes and consumer products in order to give materials such as water, dirt and grease repellent properties. The long half-life of some PFAS in the human body of several years will require close observation in future, because the substances can damage the liver in higher concentrations. Some of them have shown to be able to affect reproduction and to induce cancer. Levels in foods should continue to be monitored and introduction into the environment avoided, especially in regions in which conspicuously high levels have been found.

The recently published special issue of German public health journal *Bundesgesundheitsblatt*, *Contaminants in Foods*, gives an overview of the assessment strategies of possible health risks and explains what properties and hazard potential the contaminants entail, where they come from and to what extent people are exposed to them.

In addition to the persistent organic contaminants, such as the dioxins and PFAS, the special issue also deals with the latest level of scientific knowledge regarding nano- and micromaterials, as well as metals and metalloids in foods. It is also highlighted that packaging materials contain substances that can migrate into food. Thus, for example, mineral oil components can transfer from recycled cardboard boxes into food, since printed paper possibly containing mineral oil components from newspaper printing ink is part of the recycling stock.

The special issue also describes examples of contaminants of natural origin and others induced by heating. An essential determining factor of possible health risks is the exposure, ie, the actual intake quantity of potentially health-affecting substances by humans. This estimation of exposure is explained using the example of the MEAL Study (meals for exposure assessment and analysis of foods).

## Improving foodborne disease surveillance on a global scale

Foodborne disease surveillance is not easy because of the difficulties of linking cases of disease with the contaminated food source. Roughly 10% of people fall ill each year after eating contaminated food but identifying the source of the contamination is not simple, especially as symptoms sometimes only become evident weeks after the pathogen-containing food was consumed. With food now a global commodity, identifying sources of foodborne disease must be looked at and communicated globally rather than on a country or regional scale.

PulseNet International, a global network of public health laboratory networks, dedicated to bacterial foodborne disease surveillance, is advocating the use of whole genome sequencing (WGS) to improve detection of and response to foodborne illnesses and outbreaks.

Multilocus sequence typing exploits the unambiguous nature and electronic portability of nucleotide sequence data for the characterisation of microorganisms. As sequence data are truly portable between laboratories, one expanding global database per species can be maintained on the World Wide Web enabling exchange of molecular typing data for global epidemiology via the internet.

The sharing of information within regional and global public health laboratory networks will increase efficiency and enable data to be compared across countries in real time, which is currently not the case. This is especially important due to international travel and trade. Linking human cases with contaminated food sources on a global level will ultimately save lives and money.

According to PulseNet International's article in the June issue of *Eurosurveillance*, common steps for validation studies, development of standardised protocols, quality assurance programs and nomenclature have been agreed. The article also asserts that a global standard method for primary sequence data analysis based on whole genome Multiple Locus Sequence Typing (wgMLST) and derived public nomenclature will be adopted.



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## Dearer milk and milk products on the horizon

The ongoing rebalancing of supply and demand in global dairy markets has led the Fonterra Co-operative Group to increase its forecast Farmgate Milk Price for the upcoming 2018 season. The new forecast is \$6.75 per kilogram of milk solids (kgMS), replacing the May 2017 forecast of \$6.50/kgMS.

Fonterra's chairman, John Wilson, said "We are seeing growing confidence on-farm across the country and, with global demand for dairy strengthening, the signs are for a good start to the season for our farmers and their rural communities, although following a challenging period of very wet conditions for some of our farmers."

Chief Executive Theo Spierings meanwhile said the Co-operative is well positioned to take advantage of improving demand for dairy nutrition across Fonterra's ingredients, consumer and foodservice markets.



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## Wells and Miele partnership facilitates validated cleaning programs

It is a requirement (ISO/TS 22002-1) for all food processing facilities to have in place a documented cleaning and sanitising program. This program importantly also covers the cleaning of the cleaning equipment (sub clause 11.3).

Even though contaminated cleaning and food handling tools pose a great risk for cross-contamination and product rejection, food processing companies regularly struggle with implementing a simple and validated process for the cleaning of their cleaning tools.

To address this, Wells and Miele have developed a validated process for cleaning and decontaminating hygiene brushware and associated tools. Developed after extensive trials and validation with leading innovative Australian dairy company Bega Cheese, Wells launched the program at the recent foodpro expo in Sydney.

Miele has partnered exclusively with Wells as its strategic partner to supply its professional decontamination washing machines to the food processing sector in Australia and New Zealand.

## Unintended discovery of a new natural orange colour

Gregory R Ziegler, professor of food science in the College of Agricultural Sciences at Penn State University was extracting starch from avocado pits when he noticed something interesting — when avocado pits are pulverised, an enzymatic reaction produces a bright orange colour. After extracting the starch, Ziegler just couldn't get the colour to wash away.

So he and associate professor of food science Joshua Lambert put in the hard yards to identify the coloured compound. The pair's research, which proved both the stability of the colour and the wide spectrum of orange, yellow and red hues available, led them to a simple conclusion: the substance would be a perfect natural food colour.

Persea Naturals was born, with plans to bring a natural food colour product line, AvoColor, to the commercial market. 'Persea' comes from *Persea americana*, the scientific Latin plant name for the avocado plant.

Not only is AvoColor more vibrant and stable than most other natural options, it's likely to be extremely cost-effective. Avocado pits, which are the source, are currently discarded in large volumes by the prepared food and restaurant industries.

AvoColor has been highly successful in nearly every test, whether it's added to dairy products, baked goods or beverages.



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# Packing carrots

An Ishida multihead weigher at premium Irish vegetable grower Leo Dunne has played a central role in helping the company expand its operation into the supply of processed carrots.

Leo Dunne has been delivering fresh Irish products to the retail sector for generations. Recently the company recognised that oversized or irregular carrots that were not suitable for the prepared carrot market were nevertheless still high-quality products, which could be successfully marketed through further processing. It therefore required an effective processing and packing line in order to maximise the potential of this new market.

The Ishida 10-head waterproof mid-range model with 3-litre hoppers is delivering excellent accuracy and reliability, achieving around 55 packs/min on 500 g bags of carrots, with an overall accuracy rate of 98%.

Equally important, the machine's ease of operation, including fast start-up using the simple-to-use remote control unit (RCU), gives it the flexibility to cope with the varying production demands of the Leo Dunne operation.

Leo Dunne specified the Ishida weigher for the new line based on the company's established reputation in the marketplace.

"We knew Ishida had a great name in the industry and had received positive reports from other users," explained Leo Dunne Manager Emmet Dunne, "and we have not been disappointed with our choice.

"The machine's ease of operation means our staff all like it. It is also far more intuitive than other weighers, so that if there are any minor issues during production, the machine will identify these and inform operators how to fix them. This is vital to maintaining production."

And while the machine's reliability is an obvious benefit, so too, says Dunne, are the high levels of after-sales service provided by Ishida and its agent, SF Engineering.



"Knowing we have someone on the spot who can deal with any issues we have is absolutely critical to ensuring we can meet the requirements and deadlines of our retail customers," he said.

The Ishida 10-head multihead is part of a complete line devised and installed by SF Engineering which also includes a swingloader, a bespoke sorting table, an elevating conveyor and support platform, and a Ceia metal detector.

Leo Dunne anticipates that the new facility will pay for itself within three years. And while the system was designed to handle carrots, it can also be used for other products, giving the company enormous flexibility and the ability to react to market trends and developments.

In addition, by using all its surplus stock, Leo Dunne has achieved major efficiency gains and a significant reduction in its carbon footprint.

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# Well filled

Peppers, chillies and olives with a filling are classic Mediterranean starters. The tasty dishes should be fresh, full of flavour and also a treat for the eyes. The antipasti specialities can now be found in food shops in an increasing number and variety. Until now, filling the little delicacies has purely been a manual job — a time-consuming and cost-intensive one. Automation technology now makes the process easier and faster.

Even though many steps in industrial food production are already automated, filling antipasti is still a manual job. Practised employees do manage to fill up to 1000 items an hour, but it is an exhausting procedure which requires a high degree of hygienic care due to the manual processes involved. Each individual fruit has to be picked up by hand and then filled with cream cheese. During the process, food manufacturers have to work quickly and above all in a hygienically sound manner whatever happens.

## Automatic filling and cleaning

Mechanical engineering company Karb Maschinenbau has, with help from Festo, developed a machine that automatically fills peppers, tomatoes and chillies. The employees only need to place the fruit or vegetables onto filling nozzles. The machine does the rest using automation components supplied by Festo. In this way, up to 14,500 antipasti an hour can be produced.

Sophisticated, highly sensitive sensor technology — details of which Karb Maschinenbau is keeping under wraps for product protection reasons — ensures that the correct amount of fill-

ing is dispensed. The sensors automatically detect when the pepper is full and report it to the machine controller within a fraction of a second. The machine controller then sends the stop signal to the Festo cylinder EPCO, which is responsible for the filling process. Because hygiene is as important as speed in the food industry, the system has an automatic cleaning program. A solution of water and cleaning agent instead of cream cheese is flushed through the pipes to clean them.

## 20 peppers in one swoop

Two EvoGuard valves, 20 EPCO cylinders, five valve terminals CPX/MPA, 20 cartridge cylinders EGZ and an MS series service unit keep the process running smoothly. The hygienic valves EvoGuard, which are tailored precisely to the requirements of the food industry, control the infeed of the cheese at process level, while the EPCO electric cylinders take care of the actual filling process. They draw cream cheese into a type of syringe and inject it into the vegetable. The combination of system controller and sensors ensures the perfect fill quantity. 20 vegetables can be filled at a time in this way.

Because the cavities of peppers, chillies, etc, vary in size, the system uses its sophisticated sensor technology to detect the level of each individual vegetable and waits until the last is filled to the top with cream cheese before placing all the vegetables onto a conveyor at the same time. The valve terminal CPX/MPA, which controls the proportional valves for the grippers, ensures highly sensitive gripping without pressure marks. The grippers developed by Karb Maschinenbau use Festo cartridge cylinders EGZ.

The production speed has been increased by more than 3.5 times with this technology. In the meantime, the mechanical engineering experts from Karb are already working with Festo on the next development stage, which is expected to automate the feed and packaging process.

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### Mushroom-picking lorry

Currently under development at Euro Pumps is the TM 3600 mushroom-picking lorry.

Some of the features include: a full stainless steel frame with an ultrasmooth electric drive; electric lift motors; auto-creep advance for hands-free operation; and onboard scales that are interfaced with the units PLC computer.

The product also offers a removable, fast exchange and recharge battery pack which is able to be swapped in only a few minutes.

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### Stone fruit pitting machines

PIGO manufactures and supplies pitting/destoning machines for most types of stone fruits.

The PG 103 is a high-capacity pitting machine for cherries, plums and apricots, while the high-capacity PG 103 D is suited to pitting dried plums and dates. The PG 104 A and PG 104 B are low-capacity pitting machines and the PG 105 is a drum destoning machine.

All of the pitting machines are made with a drive mechanism that ensures a long operation life, with no required continuous adjustments during the operation. The construction is customised according to the characteristic of the fruit to be processed, which ensures high efficiency together with gentle handling of the product.

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# Going veggie

## has never looked or tasted so meaty

With a much smaller environmental footprint than meat, plant-based diets are much better placed to feed a growing population sustainably. But most people really enjoy their meat. Now you may be able to have the best of both worlds.

Impossible Foods is making meat directly from plants. And its target market is not vegetarians, but meat eaters.

The company's flagship product, the Impossible Burger, is made through a simple combination of plant-based ingredients. A key ingredient is 'soy leghemoglobin'. Soy leghemoglobin is a protein that carries 'heme', an iron-containing molecule that occurs naturally in every animal and plant.

The molecule was initially extracted from root nodules of soybeans, but this proved to be unviable on a commercial scale. Impossible Foods has instead genetically engineered yeast to produce heme, and now makes the molecule in vats.

Impossible Foods is no fly-by-night snake-oil company. The US Patent and Trademark Office has already issued US Patent No 9,700,067 covering Impossible Foods' technology to use leghemoglobin in plant-based meat, and the 200-person start-up has more than 100 additional patents pending.

The privately held company was founded in 2011 by Patrick O Brown, MD, PhD, formerly a biochemistry professor and Howard Hughes Medical Institute investigator at Stanford University. Investors including Temasek, Open Philanthropy Project, Khosla Ventures, Bill Gates, Google

Ventures, Horizon Ventures, UBS and Viking Global Investors have already put US\$180 million into the company and another US\$75 million has just been pledged after the company announced significant milestones in intellectual property and food safety.

### The Impossible Burger

The Impossible Burger is claimed to be the world's only burger that looks, handles, smells, cooks and tastes like ground beef from cows but is made entirely from plants, with a much smaller environmental footprint than meat from animals.

The heme in the Impossible Burger is identical to the heme humans have been consuming for hundreds of thousands of years in meat — and while it delivers all the craveable depth of beef, it uses far fewer resources.

The Impossible Burger uses about 75% less water, generates about 87% fewer greenhouse gases and requires around 95% less land than conventional ground beef from cows. It's produced without hormones, antibiotics, cholesterol or artificial flavours.

The product's full ingredient list is: water, textured wheat protein, coconut oil, potato protein, natural flavours and

2% or less of leghemoglobin (soy), yeast extract, salt, soy protein isolate, konjac gum, xanthan gum, thiamin (vitamin B1), zinc, niacin, vitamin B6, riboflavin (vitamin B2) and vitamin B12.

In 2014, a panel of leading food safety experts gave the opinion that the Impossible Burger's key ingredient, soy leghemoglobin, is "generally recognised as safe" (GRAS). GRAS means a food is safe to be consumed under US regulations.

Additional testing — including a stringent rat feeding study — provided even more objective, scientific data that the product is safe. That 2016 study examined whether consumption of soy leghemoglobin in amounts orders of magnitude above normal dietary exposure would produce any adverse effects. There were none. A comprehensive search of allergen databases found that soy leghemoglobin has a very low risk of allergenicity, and it's shown no adverse effects in exhaustive testing.

### Making 454,000 kg of plant-sourced meat per month

Impossible Foods has launched its first large-scale production facility in Oakland, California, which when fully operational will be able to produce 454,000 kg of meat per month from plants.

The goal is to make enough Impossible Burgers to serve 4 million people per month within a year.

The Impossible Burger debuted in July 2016 in New York City at Momofuku Nishi, the restaurant of chef David Chang. In addition, it is available at acclaimed restaurants Jardinière and Cockscomb in San Francisco, as well as Crossroads Kitchen in Los Angeles. It is available in New York at the Michelin-starred restaurant PUBLIC and its sister bar, The Daily, and at meat-centric bistro Saxon + Parole.

Bareburger serves the Impossible Burger exclusively at its outlet near New York University's campus, but as the facility ramps up, more outlets in the 43-unit Bareburger chain will be adding the Impossible Burger to their menus.

## Flow switch series chemical injection

The FLT93 Flow Switch Series from Fluid Components International (FCI) provides a solution for verifying chemicals or additives are being injected and ensuring injection pumps and feeders continue to operate.

It is suitable for flow detection of liquids or gases and is available in several wetted materials for compatibility with virtually any fluid. It is a dual-function instrument capable of monitoring and alarming on both flow and temperature in a single device. Dual 6 A relay outputs are standard and are assignable to flow or temperature. The flow switches can be specified in either insertion or inline styles for installation in pipe/tube diameters from 0.25" and larger.

For monitoring chemical and other additive injection flow in small line sizes, the model FLT93L is an inline-type flow switch that can detect liquid flow rates as low as 0.015 cc/s and gas flow rates down to 0.6 cc/s. Models FLT93S and FLT93F are insertion types and are the solution for liquids and gases in larger diameter pipe sizes, respectively. And, for sanitary processes, the model FLT93C provides 20 Ra electro-polished 316 L stainless steel wetted parts and tri-clamp sanitary flanges to meet the requirements in the food, beverage and pharmaceutical industries.

The flow switch utilises thermal dispersion technology, which has no moving parts to foul or clog, and requires no routine maintenance and has a long service life. Its electronics are housed in a NEMA 4X/IP67 rated aluminium or stainless steel enclosures to deliver durability and reliability under the harshest process conditions. As further testament to this reliability, the product series is SIL 2 compliant and carries a three-year warranty. Temperature compensation assures no false trips should fluid or ambient temperatures change. The product flow switches feature a universal 24 VDC/85–265 VAC power supply, temperature service up to 454°C and a broad selection of process connections including compression fittings, flanges and packing glands. Agency approvals and certifications include: FM, FMc, ATEX, IECEx, Inmetro and EAC/TR CU for Div.1/Zone 1 areas, CE, CRN, PED and RoHS compliant.



**AMS Instrumentation & Calibration Pty Ltd**

[www.ams-ic.com.au](http://www.ams-ic.com.au)



## Heavy-duty cable magnetic holder

The Adept Direct Magnetic Cable Hook heavy-duty cable magnetic holder is a magnetic bracket for hanging hoses, cables, power leads and pneumatic lines — anything that creates trip hazards on food plants. These magnetic cable and hose holders are suitable when performing maintenance around food and beverage processing machinery. They help to keep trip hazards up off the floor and power leads and electrical cables out of the inevitable water on the floor.

The product can be easily attached to any steel surface (steel site sheds, steel fencing, purlins and steel framing) using the large round zinc-plated 25 kg magnet. The non-conductive HDPE strap is simply looped under any hoses, leads and cables and clipped up into the top locking mechanism. It is designed to be secure, easy and safe.

In a few seconds, the product can be quickly detached and moved to any area that requires cable holders. No tools are needed and there are no screws to undo. Users

just need to slide the cable magnet sideways and reinstall into the new location.

Features include: safely supporting multiple cables, air lines, electrical leads and hoses; high-visibility, bright orange HDPE cable strap for increased safety; durable zinc-plated magnet and cable hook; powerful magnet supports up to 25 kg in the vertical plane; cable holder dimensions of 120 mm wide x 250 mm high; and a weight of 0.3 kg.

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## Continuous inline injection

The GEA MultiJector is designed for marination by a continuous inline injection solution. Developed to boost the yield of bone-in and skin-on poultry products such as chicken wings, drumsticks, thighs, legs and whole or half birds, the GEA MultiJector combines controlled brine injection with short massaging to optimise brine distribution.

The multipurpose brine injector does not compromise on the accuracy or performance available from an application-specific machine. It meets standards for hygiene, food safety and cleanability. The product is a flexible solution for injecting bone-in, boneless and delicate products, with advanced technology that adds value to products and processes.

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# Tomato transparency: from vine to dine

February to April is tomato harvest time in Victoria, with Australia's premier tomato processor, Kagome, processing around 180 tonnes of tomatoes every hour, 24 hours a day, for 70 days straight.

**M**ore than 4000 tonnes of tomatoes are processed each day and, by the end of the season, 40,000 tonnes of tomato paste and diced tomato products have been made.

Kagome-owned farms grow about half of the tomatoes, with contracted growers supplying the rest. But all harvesting is done by Kagome, using its own harvest fleet. Coordinating this operation through 500-odd phone calls each day and paper records was a mammoth task. So Kagome approached Microsoft's partner, Advance Computing, to digitally transform the entire process.

Kagome wanted to know exactly where the tomatoes came from, when they were picked, which truck delivered them, when they arrived at the plant, processing conditions, when they were packed and where they went ... In other words, they wanted transparency from vine to dine.

Advance Computing devised an Internet of Things (IoT) solution that incorporated data from on-farm sensors, in-truck devices and technology installed in Kagome's loading bay to ensure that the company could have a clear window on its operations. The system is based on Windows 10 IoT devices and a range of Microsoft Azure cloud technologies, reporting and analytics tools.

Kagome's CEO, Jason Fritsch, says that the Azure-based solution paid for itself five times over in its first season.

## How it all works

Using the IoT solution and the range of Microsoft Azure cloud technologies, Kagome is able to collect RFID information about its raw product at each step of its journey from the farm to the factory. All harvesters, tractors and collection bins have been fitted with RFID tags and GPS technology. Load-measuring cells on the trailers that hold the bins as they are loaded with pro-

duce give farmers visibility of the weight of the produce as it is being harvested. This enables operators to track the actions in the field, and to record the amount of produce collected.

The GPS-located IoT system means yield can be tracked against paddock boundaries and visualised in heat mapping of fields, which will be collected over time to show productivity rates and yield patterns. Kagome is working on using this information to help forecast production and plan for potential yield ahead of harvest.

A web app enables Kagome's logistics team and drivers to move the perishable product on a first-in, first-out schedule while maintaining an efficient, steady flow into the plant.

100 B-Double trucks deliver the tomatoes to the factory, where a weighbridge marries up the incoming bins with an accurate weight measure for the incoming delivery. When a bin crosses the weighbridge at the plant, and is tipped into the processing line, an IoT device reads when the bin was harvested and the GPS location it came from.

The bins are then allocated to a product line, where the contents are processed into either tomato paste or diced tomatoes.

Processed tomatoes are then fed into 'pack-off' bins and barrels, which are also all RFID tagged, and then shipped to end users across the country and the globe.

Company executives, farm owners, factory staff, end customers and food safety authorities can all access data held in the Azure cloud platform via PC or web apps accessible on mobile devices.

The full supply chain visibility afforded by the IoT/Azure system enables Kagome to be confident in the provenance of its product. This level of traceability means Kagome can tell the whole history of any packet of its tomato paste — down to where and when the tomatoes were harvested.



Kagome — Australia's largest tomato processor (<https://kagome.com.au>).



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## Hygienic dispenser for precision dosing

The VHD Hygienic Dispenser can be used for optimising precision dosing in the food and cosmetics sectors. Based on ViscoTec's endless piston principle, the dispenser is not only precise but also meets stringent hygiene requirements.

The product has the ability to dose and deliver micro doses with hygienic standards which are said to come close to those of the pharmaceutical industry. It can be implemented on the production line with ease, particularly when it comes to dosing small quantities in the production of food and cosmetics.

The dispenser is even capable of delivering or applying difficult high-viscosity liquids. Decorative finishes with icing or chocolate can be achieved with simple process steps.

The benefits of the endless piston principle include adjustable suckback, which is said to ensure clean dosing and maximum precision, and can now be implemented in all manner of delivery and dosing applications in the field of hygiene and aseptics.

**UV Pacific**

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



## Lightweight foam spray gun

Typically, compressed air is required to produce foam during washdown when using sterilising agents and cleaners. But for small areas or applications where this type of cleaning is seldom required, it's hard to justify the expense of installing compressed air lines.

The foam spray gun from Tecpro Australia eliminates the need for compressed air. Using a foaming head that's shaped like a duck's bill, the product aspirates the antiseptic and water mix within the unit.

The foam is produced using holes along the sides and back of the nozzle, which create a built-in air induction system. The foaming nozzle can be removed for rinsing and simple hose down.

In addition to removing the need for compressed air, the foam gun is lightweight and durable. It weighs 660 g, with a stainless steel spring, axel and control lever. The fixed rubber grip is made from EPDM rubber to minimise heat transfer and is suitable for temperatures up to 50°C.

It works in environments with low water pressure but can handle up to 12 bar (170 psi).

**Tecpro Australia**

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

## Touch computers

The STX X9000 Harsh Environment Touch Computer range can be used in many applications including weigh-scale stations, label printing, HMI and other rugged industrial situations.

Based on the X7000 and X8000 ranges, the X9000 range is designed to withstand challenging environments such as the outdoors in harsh chemical plants, the demanding job of the visceral tables in the meat industry and other tough situations where continuous 24/7 operation is imperative.

The range is manufactured in either 304 or 316 stainless steel, with protected IP67 (NMEA 6) connectors and a touch screen that is bonded in.

STX's products are made for a wide range of uses including meat, fish and food production, pharmaceuticals, dairy industry, cow sheds and other industrial purposes.

Available with either resistive or projective capacitive touch and multiple port configurations, the versatile product is available with a range of mounting options and a selection of screen sizes and formats.

### STX Technology

[www.stxtechnology.co](http://www.stxtechnology.co)



## Compact chamber belt machine

The B 325 combines all the advantages of MULTIVAC's chamber belt machine technology in a space-saving machine design. The economical machine can achieve a high cycle output due to an especially compact chamber. The product can be equipped with various pump combinations depending on the desired output.

The chamber is equipped with two sealing bars and enables loading on both sides. With its manual sealing height adjustment, it is suitable for packaging products of varying heights in large batches. Intelligent design, such as the tool-free removable sealing bars and the elevated service position of the chamber lid, also enables simple operability and servicing of the machine.

### MULTIVAC Australia Pty Ltd

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### Pork belly processing system

Pork processors who want to improve pork belly and bacon processing yields while reducing labour will be interested in the DSI 800 Pork Belly Processing System. The product automatically inspects, trims and sorts pork bellies by employing sophisticated software combined with a machine vision system and high-pressure water jets.

This system can sort products by weight, thickness or other attributes and can optimise yield in consideration of the user's daily production targets. An integrated statistical process control system provides valuable insights and stores production information.

**JBT FoodTech**

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### Frying oil life extender

The Dallas Group of America's MAGNESOL filter media is claimed to extend the usable life of frying oil, improve product quality and reduce frying oil costs. Being a preferential adsorbent, MAGNESOL reduces soluble impurities formed during the frying process that cause off-odours, off-flavours, off-colours, free fatty acids and polar compound formation.

This safe, pure white compound removes both solid and dissolved impurities so that users can create consistent, crisp and golden fried foods.

MAGNESOL meets the food-grade specifications of the FDA, NSF, and JECFA of WHO.

Use of the filter media results in lower oil consumption, hence creating a positive impact on the environment and a safer work space.

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### HACCP certified gloves

Recognised by the FDA as a skin protectant, Mun Australia's HACCP certified GloveOn COATS gloves are suitable for everyday use in all professions, including the food and beverage industry.

Mun Australia's GloveOn COATS gloves contain a coating of all-natural oats that protects and moisturises users' hands while they work, leading to healthier skin. Users can expect better skin barrier integrity, the prevention of skin irritation and hydration dermatitis, pH buffering and a comfortable feel.

The gloves are available in both nitrile and latex.

**MUN Australia**

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

## Wi-Fi accelerometer and data logger

The BeanDevice Willow AX-3D is an ultralow-power Wi-Fi accelerometer with a built-in data logger. It is designed for wireless structural health monitoring, condition monitoring, dynamic measurement on rolling stock and vibration analysis.

The BeanDevice integrates an antenna-diversity design, boosting the radio link quality in environments subject to random and diverse disturbances. Antenna diversity improves both the quality and reliability of a wireless link by 30%.

Due to an onboard shock sensor coming with SSD (smart shock detection) technology, the user can trigger both data acquisition and device wake-up on a shock threshold. A smart energy management system (USB and energy harvesting) allows the product to be powered by the internal lithium-polymer rechargeable battery, a USB power bank or directly from a solar panel. Store and Forward+, a lossless data transmission mechanism, enables a large-scale deployment of Willow wireless sensors in industrial applications where data transmission is critical.



Ready for IoT applications, the unit integrates MQTT, a lightweight and open-source IoT protocol. Users can quickly set up a scalable IoT application.

With the ability to store up to 5 million data points, the device is IP67 protected and has a lightweight aluminium casing. It is capable of low noise operation (45  $\mu\text{g}/\sqrt{\text{Hz}}$  for the  $\pm 2\text{g}$  version), has an antenna range of 200 m and consumes only 60  $\mu\text{A}$  in sleep mode.

**Bestech Australia Pty Ltd**  
[www.bestech.com.au](http://www.bestech.com.au)

## Food-grade belting

Ammeraal Beltech SOLICORDBLue food-grade round, vee and specialised belts are BEHA FDA compliant. The belting is produced in an easy-to-identify blue colour making it easy to see, should a small piece get into the food during the production process.

The line of metal-detectable food-grade belting increases food safety. PU80A SAFE belts are made of a thermoplastic recipe that allows very small particles to be detected by most standard metal detection equipment used in the food industry.

Metal detection with PU80A SAFE are FDA/EC compliant, can be used in dry and wet applications, and allow small pieces to be detected, ensuring food safety by reducing the risk of contamination. The belting is available in: round, vee, flat belt and special profiles.

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# Machine use optimisation in Australian wineries

**Artificial intelligence is helping the Australian wine industry to significantly increase production efficiency by optimising machine use. Surely this system would have applications across at least all beverage manufacturers, if not the entire food industry.**

The artificial intelligence (AI) program has been developed Ailytic, a South Australian-based company that devises decision support solutions for manufacturing, food and beverage, packaging and general process and discrete industries. The company's software enables decisions that generate significant returns by utilising AI-enabled algorithms to create production schedules in a full web-based application. Lightweight, easily deployed, cloud-based or on-premise with significant end-user focus, the company's solutions turn planners and schedulers into analysts with easy what-if comparative modelling of complex operational environments.

Pernod Ricard, Accolade Wines, Angove Family Winemakers and Treasury Wine Estates are some of the wineries that are streamlining their manufacturing through Ailytic's AI technique — prescriptive analytics. This enables users to account for all the variables that go into mass-producing wines, such as grape variety, packaging and finished product inventory.

The program then creates the best possible operation schedule, allowing companies to save considerable time and money.

Pernod Ricard Global Business Solutions Manager Pauline Paterson said AI was highly beneficial for the wine industry and helped to increase the bottom line. "We use it mainly around production line and use it to derive the most efficient way to produce our product," she said.

"It is definitely helpful with changeover, how many bottles we need, how much wine and what order to do everything in."

Ailytic's system is able to obtain essential information from wineries using remote sensors, which are placed on equipment and around winemaking facilities. These sensors track a number of key metrics, including throughput, machine uptime and changeover time from red to white when bottling. This includes the subclassification of each colour, such as sweet red, dry red, aromatic white and fortified wines.

Ailytic's program ensures that wine is changed quickly, without contamination, bottled using appropriate glassware, labelled and then packaged appropriately. The sensors then transmit the data to a computer in real time using Wi-Fi.

A single production run for bottling can take anywhere from one hour to two days, but Ailytic's system reduces time spent changing the line set-up by up to 30%.

Pernod Ricard is the world's second leading wine and spirits company, with a network of growers across six countries and €8.68 billion in sales in 2015. Its brands include Jacobs Creek, Campo Viejo, Brancott Estate, Kenwood Vineyards and Wyndham Estate.

Ailytic co-founder and CEO James Balzary said the company's AI program was perfect for the wine industry because it thrived in complex environments.

"Our algorithms work well for things like packaging, bottling and general manufacturing — the wine industry is where we are seeing a lot of appetite and the most uptake," he said.

"People think of wine as a romantic artisan type of process, and it is when you are producing small batches or super-premium wine, but the majority of wines we drink are mass-manufactured in big, complex tank operations. That's where we come in — the more complex the business, the bigger the benefit.

"Even though the bigger wineries would find this more useful, even smaller operations will benefit from this," Balzary said.

"It's an affordable solution that used to only be accessible to bigger companies, but we try to focus on bringing advanced capabilities to Tier 2 and Tier 3 manufacturers and service providers."

*This is a modified version of a story published by The Lead South Australia under Creative Commons.*

**Ailytic**  
www.ailytic.com

## Stainless steel motor/gearbox unit

Hydro-Mec has launched a completely stainless steel motor/gearbox unit. The motor and gearbox are said to solve problems on the production line including corrosion, poor hygiene, contamination in food and even health inspector visits.

The gearbox combination is designed and manufactured to operate in extreme conditions with high or low temperatures, high humidity, steam, water, etc. It can be hosed down with any caustic cleaning solution and will remain in good condition. It is suitable for any food processing company that has to wash down its machines to keep them clean.

**Lafert Electric Motors**

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

## Odour control systems

Hydroflux's Neutralox photoionisation odour control systems addresses the poor or unmanageable odour control wastewater treatment and sludge handling facilities.

Traditional odour control systems have been around for a long time, but unfortunately, they also have a lot of downsides: carbon absorption systems require expensive media replacement and disposal; liquid scrubbers use large volumes of expensive chemicals and produce yet more effluent; and biofiltration systems take months to start working, take up a large area of land and again produce more effluent to treat.

Internationally, especially in Europe, these technologies are rapidly being phased out and this process is now available in Australia and New Zealand. This low-energy and sustainable odour control process is designed to replace the older unsustainable and expensive technologies.

Photoionisation systems are incredibly compact, operate without chemicals, do not produce effluent and do not work by absorption. They also work the moment they are turned on and can be turned on and off as needed.

Essentially based on the application of high-intensity UV-light and using specialised catalysts, in addition to highly effective odour reduction, the process also provides extensive air disinfection.

However, of most appeal is the low power demand. With a compact size and no air restrictions, the system can use smaller fans than are required with bio filters, carbon adsorption filters and scrubbers.

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# Implementing Industrie 4.0 on an international scale

**G**erman researchers are in the process of establishing the Industrial Data Space, a virtual construct for secure data sharing based on standardised communication interfaces.

Its key feature is data sovereignty: it allows users to monitor and maintain control of their proprietary data by enabling them to decide who has the right to access these data and for what purpose.

The research project, for which the German Federal Ministry of Education and Research has granted funding of €5 million, is now moving on to its second phase, which aims to see this architecture adopted internationally.

Data represents a resource of growing strategic importance to businesses in every sector of the economy. But this places data owners in a quandary, because the higher the value of their data, the greater the need for protective measures that conflict with the data-sharing imperatives of an economy based on increasingly complex data-based services and new digital business models. To resolve this dilemma, 12 Fraunhofer Institutes have spent the past two years working on a solution they call the Industrial Data Space. They recently completed the first phase of the project, in which a reference architecture model for a secure data space has been defined, based on the latest IT technologies, and the first cross-sector use cases have been implemented.

“Germany must secure itself a position at the cutting edge of system-related innovations. Right here and now, we have a compelling opportunity for Germany to take the lead in the digital transformation of industry by creating a de facto standard that has every chance of being adopted throughout Europe and even worldwide,” said Professor Reimund Neugebauer, president of the Fraunhofer-Gesellschaft. “Data sovereignty is the key to

success for many businesses. Our initiative provides the ideal data security framework.”

“Companies operating in Germany and throughout Europe can rest assured that the Industrial Data Space is a concept that will keep their data safe. And if we can establish the concept as an international standard, German industry will be the first to benefit,” said German Federal Minister of Education and Research Professor Johanna Wanka.

The next project goal is to carve out a position for the Industrial Data Space in relation to and in interaction with other reference architectures, such as those being developed by the Industrial Internet Consortium in the US or the Japanese Industrial Value Chain Initiative — because, in today’s global supply chains, the flow of data is not restricted to a single country and companies therefore need integrated, cross-border solutions.

“The Industrial Data Space concept has met with considerable interest in many workshops and forums held in connection with Germany’s G20 presidency. Data sovereignty made in Germany is a popular concept,” commented Professor Boris Otto, head of research for the Industrial Data Space initiative and director of the Fraunhofer Institute for Software and Systems Engineering ISST. “We are currently in discussions with partners in many countries, including Argentina, China, India, Japan, Mexico and the United States, with the goal of establishing the Industrial Data Space architecture on an international basis.”

To ensure interoperability with the many different digital standards in use around the world, the project teams are developing technological blueprints for data sovereignty solutions. Fraunhofer researchers are working closely with the Industrial Data Space Association to apply their results in the form of use cases for partner companies.

## Modular tower lights

Tower lights are commonly used on equipment in industrial manufacturing and process control environments to provide visual and audible indicators of a machine state or process event to machine operators, technicians, production managers and factory personnel.

The QT70 series tower light is 70 mm in diameter and allows for customisation to specific needs using modular components such as the lens, buzzer (buzzer module position can be freely chosen), Ethernet cable, USB cable and mounting brackets. Additional tools are not required for assembly.

The product consists of LED modules, a base module, a sounder module and a pole module. The modular LED components colour combinations are red, amber, green, blue and white, and can be arranged to the user's desired position.

Users can select from a variety of pole lengths to fit their application needs: 100, 250, 400 or 800 mm. The ambient operating temperature range is -30 to +50°C and the protection rating is IP54.

**Leuze electronic Pty Ltd**

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



## Fanless embedded computer

The Neosys Technology POC-300 Series fanless PC controller has ultracompact dimensions of 149 x 105 x 57 mm.

Its footprint is similar in size to a 3.5" hard disk drive. Powered by the Intel Apollo Lake Pentium N4200 and Atom E3950, the product is capable of supporting a maximum of 8 GB memory to meet the demands of high-performance applications. The isolated I/O provides users with connectivity for digital devices, while the interior design minimises compatibility and cabling issues.

The product supports rich I/O interfaces, including 4 x COM ports, 4 x USB ports (3 x USB 3.0, 1 x USB 2.0), 4 x isolated digital I/Os, 2 x PoE Gigabit Ethernet ports, 1 x Gigabit Ethernet port and 1 x mSATA port. The product also provides one Mini-PCIe slot with one USIM socket for wireless requirements.

Users can add many expandable modules to the system, including extra COM Ports or an additional PCIe socket.

The product's mechanical and thermal design improves the heat dissipation more efficiently by utilising an aluminium alloy chassis. Supporting industrial SSD storage, the product meets an extended operating temperature range of -25 to +70°C suitable for harsh Australian environments.

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The safety gate system **PSENmlock** offers a safe interlock and safe guard locking in the one slimline device.

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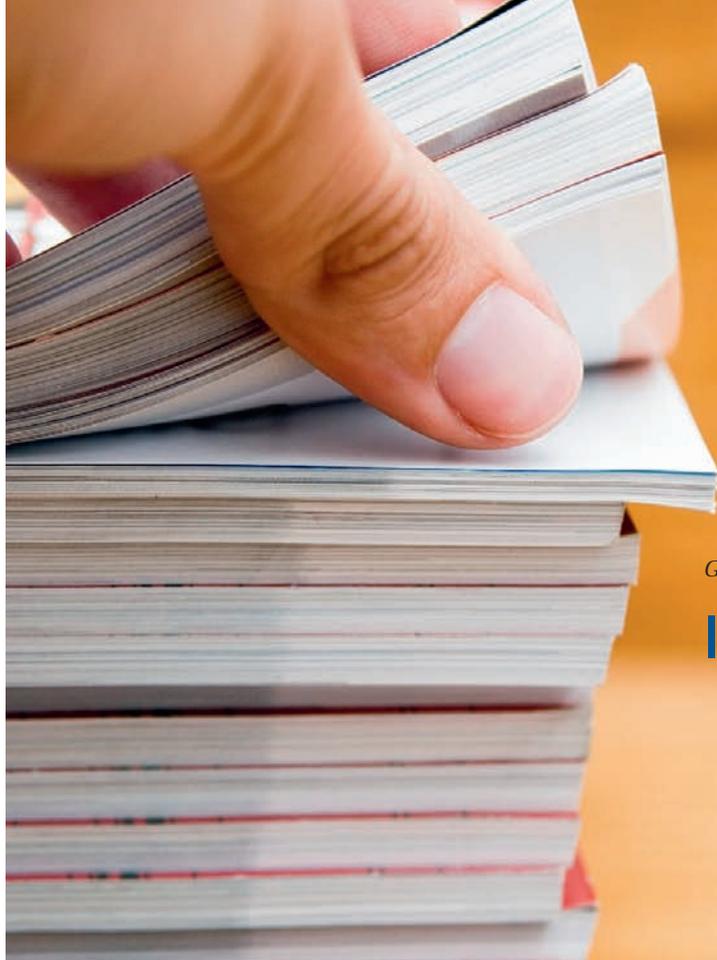
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Gareth Higgins

## Implementing a paperless HACCP system

**F**ood safety is an ongoing issue for any manufacturers who produce or package edible materials. As such food safety programs must be developed to document a business's practice of handling food. Hazard Analysis Critical Control Point (HACCP) provides a systematic preventive for food safety planning and is encouraged within Australia to uphold and ensure correct practices. HACCP is also internationally recognised and often a requirement when importing or exporting food, beverages or raw material.

Businesses should record and retain copies of action taken demonstrating compliance with the food safety program and ensure it is audited by a food safety auditor. Paperless inspection software in combination with mobile devices simplifies this process by providing automated inspection processes, allowing employees to create routine checks of critical control points and identified potential hazards. Not only does this save time, energy and money, it allows for employees to prepare and anticipate potential threats and create effective work routines and high-quality workplaces.

### How to create a thorough and effective seven-stage HACCP system

1. Hazard analysis: This stage can be completed by identifying any hazardous biological, chemical or physical property in raw materials and processing steps, and to assess their likeliness of occurrence and potential to manufacture food unsafe for consumption. This stage can quickly be completed by using mobile devices to photograph and annotate potential hazardous areas at all touch points raw materials coincide with.

2. Critical control points: An area which is controlled to prevent/eliminate the possibility of a hazard occur. By referring to collected images and notes, a logical decision can be concluded whether preventive steps need to be introduced.

3. Critical limits: This stage concludes an acceptable or unacceptable level of use ie, temperature, humidity, water activity etc. Once evaluated appropriately, it can be noted for

future use alongside the existing imagery. This imagery also acts as references for employees as they now have photographic evidence of what acceptable levels refer to.

4. Critical control monitoring: Through paperless software it allows the ongoing input of data, both imagery and notes, in a logical, systematic order. This then allows a business to review trends in data input which will act as warnings and highlight areas that need attention. At this stage employees can input their name and time/date data was collected.

5. Corrective actions: Preventive procedures must be in place and developed so employees are able to intervene with different points, processes and materials before the raw material is affected. Employees may refer to electronic procedure notes allocated through the paperless solution to perform the corrective procedure correctly.

6. Evaluation procedures: Testing is needed for the ongoing evaluation of the HACCP plan and its recognised procedures. Evaluation is made easy with paperless software as after the correct evaluation is assigned, ie, observation, levels, sampling etc. Employees can then simply input data via annotating imagery on their mobile device, uploading forms and making notes using the speech-to-text capabilities of the paperless application.

7. Record keeping: Detailed records are essential to create accurate and useful data. These records encourage high-quality workspaces and correct process and are helpful for the:

- documentation of the HACCP plan;
- tracing ingredients and different process points when problems occur;
- identifying both long- and short-term trends.

By combining the tools of mobile data collection and automation, a food inspector and the community can achieve a safer food future for all.

Techs4Biz  
www.pervidi.com.au

## Liquid-state anaerobic digestion technology

Global Water Engineering anaerobic digestion technologies extract biogas from virtually any biological waste stream, including municipal food wastes from restaurants, foodservice facilities and grocery stores; municipal solid waste; and organic wastes from industrial processing facilities, food and beverage plants, and agribusinesses.

The company's RAPTOR (Rapid Transformation of Organic Residues) product provides a powerful liquid-state anaerobic digestion process that consists of enhanced pretreatment followed by multistep biological fermentation. It is suitable for both industrial and municipal applications in Australasia.

**CST Wastewater Solutions**  
[www.cstwastewater.com](http://www.cstwastewater.com)

## Data logger for pressure and temperature

The Patbox from Witt-Gasetechnik is a contact-free mobile data logger for measuring pressure and temperature rapidly everywhere in production.

The compact instrument with OLED colour display is easy to operate. It does not have to be connected, instead registering pressure and temperature via integrated sensors using NFC communication.

Once initiated via the button or timer, the box registers its measurements at intervals of 100 ms, 1 s, 10 s or 1 min. The logging runs until cancelled by pressing a button, the memory is full or the battery is empty.

The internal flash chip records 600,000 entries. At 10 measurements per second, precise progress monitoring over up to 16 hours is also possible in addition to purely random sampling.

Only 90 x 50 x 20 mm in size, the product communicates pressure and temperature data via the NFC standard. This cordless near-field communication based on RFID ensures simpler data transmission — an advantage in comparison to USB as in other systems. The measuring range extends from 1 to 2000 mbar or -20°C to 60°C. The data can be read via a smartphone or tablet app for Android.

The 550 mAh battery is charged wirelessly on a charging base. According to the manufacturer, 1.5 to seven days operating time are possible once charged, depending on the measuring interval. The device is also waterproof and dustproof according to IP55.

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### Laser for reflective surfaces

The Micro-Epsilon optoNCDT 2300-2DR blue laser sensor is specially designed for displacement and distance measurements on directly reflecting surfaces. The compact sensor operates at high speeds on these surfaces and provides maximum precision in the nanometre range.

It can be used for thickness measurements of flat glass, distance measurements on annealed glass and assembly monitoring of extremely small parts. The measuring rate can be set up to 49 kHz, making the sensor suitable for process monitoring tasks. While operating with advanced real-time surface compensation (A-RTSC), the sensor enables a precise real-time surface compensation of different surface types. Data output is via Ethernet, RS422 or EtherCAT.

The sensor is designed for a parallel installation to the measured object. The blue laser light is directly reflected onto the receiving optics by the measured object and, unlike red laser light, the blue laser light does not penetrate the object. A sharp point is projected onto the surface, which enables a stable signal on the receiver element— achieving nanometre resolution. In addition, the extremely small laser spot size allows the sensor to detect very small objects.

**Bestech Australia Pty Ltd**

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

### Chip trapper

EXAIR's High Lift Chip Trapper offers a fast, easy way to clean coolant sumps, waste oil pits or wells. The product removes the solids such as chips, swarf and shavings out of used coolants and other liquids with up to 4.5 m of lift or 6 m of horizontal vacuum. It extends the life of coolants and eliminates the worry of waste oil solids damaging equipment.

Metal chips in a machine sump can block the intake of the coolant pump, which reduces the coolant flow and causes heat-related damage to the parts and tooling. Regular cleaning of the sump with a High Lift Chip Trapper eliminates this problem, as well as lost production and downtime.

The compressed air-powered product vacuums the dirty liquid into the included drum, trapping all the solids in a re-usable filter bag. With a turn of the flow valve, clean liquid pumps back out. There are no motors or impellers to clog or wear out. Safe operation is assured with built-in pressure/vacuum relief and an automatic safety shutoff to prevent spills or overfilling.

The Model 6190 High Lift Chip Trapper is available in 113, 208 and 416 L capacities. Systems include the stainless steel two-way pump, directional flow valve, drum, lever lock drum lid, shutoff valve, 6 m vacuum hose, 6 m compressed air hose, chip wand, two filter bags and a drum dolly. The product is CE compliant.

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### In-line blender for dairies

The Tetra Pak In-line Blender D features an automation platform that continuously collects data and controls the precision of blending. This helps dairy manufacturers to improve consistency, ensure product quality and reduce costs.

The In-line Blender D is claimed to achieve a minimal variation of  $\pm 0.015$  g/100 mL, down from the average 0.050 g in conventional systems.

The blender handles a wide range of ingredients and can be customised to handle a variety of recipes, including flavoured milk, cheese milk, standardised milk for dairy powders, lactic acid drinks, condensed milk and liquid formulated products among others.

**Tetra Pak Marketing Pty Ltd**

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



## Radar level transmitter

Emerson Automation Solutions has launched a non-contacting radar transmitter that helps operators increase safety. The SIL 3-capable Rosemount 5408 non-contacting radar level transmitter uses enhanced technology and Human Centered Design to deliver accurate measurement and ease of use, supporting worker efficiency and plant safety.

To reduce complexity and enable less experienced workers to easily manage their level measurements for tank monitoring, process control and overflow prevention, the Rosemount 5408 has been designed to simplify operator tasks. Pictorial instructions and an intuitive software interface guide the operator through installation, commissioning, proof-testing, operation and maintenance. Enhanced onboard diagnostics support preventive maintenance and provide actionable information, streamlining the troubleshooting process. The ability to perform proof-testing and site acceptance tests remotely saves time, increases worker efficiency and reduces the reliance on highly experienced staff.

The Rosemount 5408 uses two-wire frequency modulated continuous wave (FMCW) technology that uses a continuous echo to maximise radar signal strength and produce a more robust and reliable measurement. In addition, radar-on-chip technology replaces a circuit board, thereby removing sources of EMC noise that can cause signal disturbance. An embedded power back-up removes vulnerability to intermittent power losses.

Supporting efforts to increase plant safety, the Rosemount 5408's SIL 3 capability enables it to be seamlessly integrated into a safety instrumented system. ATEX and IECEx approvals allow installation in hazardous locations.

**Emerson Automation Solutions**

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



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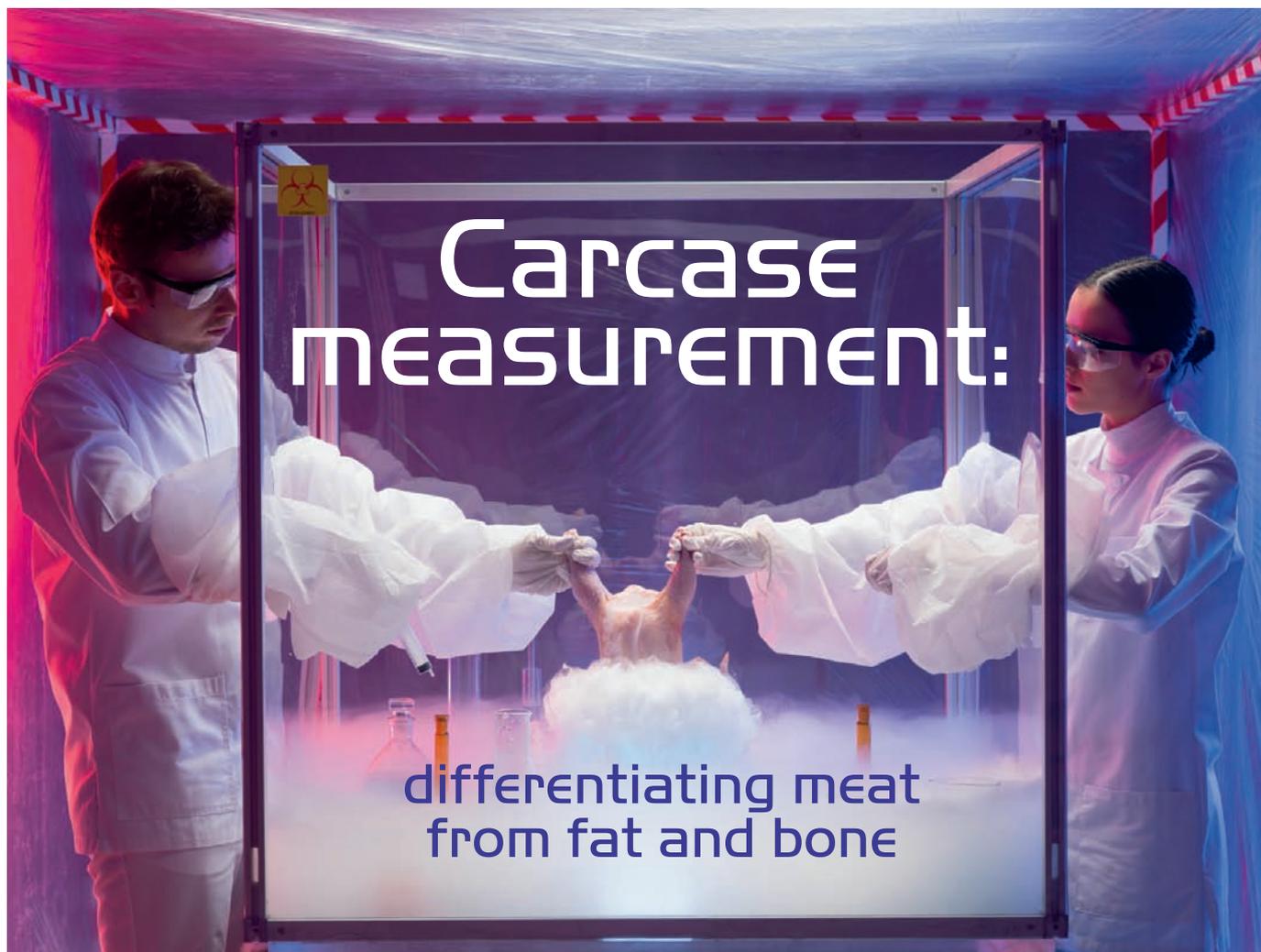
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 TECHNOLOGY



Commercial trials of a Murdoch University developed carcass measurement system which can accurately differentiate meat from fat and bone has delivered significant results.

Currently farmers are paid on the predicted amount of meat on a carcass, based on assessment of weight and fat depth. Now a new scanning technology will give much more accurate figures, even letting farmers know which specific animals are better.

DEXA (dual x-ray absorptiometer technology) was developed by Murdoch's Associate Professor Graham Gardner in collaboration with Scott Automation & Robotics. The scanning system technology provides concise information about a carcass including the amount of meat, fat and bone.

"Cattle are sold mainly based on their weight. This method is a poor indicator of the amount of meat on a carcass. Our analysis of this traditional method, using beef datasets, found that accuracy varied from 10–80%," said Assoc Prof Gardner.

"Results from the latest commercial trials shows that DEXA can accurately measure beef and differentiate meat from fat and bone with good precision.

"DEXA described 88% of the variation in carcass fatness within the mob of 50 cattle scanned, with the bulk of these predictions ranging within three carcass fat % units of their true value."

The first commercial trials of the system were carried out in a lamb processing facility where improvements in precision and accuracy were achieved. Now a Victorian abattoir has achieved similar positive results when processing beef.

Meat & Livestock Australia (MLA) has already announced

plans to install the technology at meat processing facilities throughout Australia.

In May last year, MLA announced that Murdoch University would lead a \$12.5m project to develop DEXA and other carcass measurement technologies.

The Advanced Livestock Measurement Technologies project is funded by the government's Rural R&D for Profit program. It is focused on further refinement of the lamb and beef DEXA algorithm, the development of eating quality and live animal measures, industry database alignment and the promotion of processor-producer feedback.

"This project will enable supply chains and the businesses within them to drive new efficiencies, generate more value and better meet market demands, which ultimately improves our industry's international competitiveness," said MLA Managing Director Richard Norton.

Professor Gardner said he was delighted that the DEXA scanning technology has now been selected by the Australian meat industry as the key to future efficiency savings.

He said: "Once the system has been fully implemented, Australia will set the standards which the international industry will follow."

The rollout of DEXA technology will not only bring greater accuracy in terms of meat yield and improved profit margins, it will also provide vital data that will help raise meat quality and consistency across the industry.

## Stainless steel hose reels for food and beverage businesses

Food and beverage businesses can't take the risk of buying unsuitable equipment that may need to be replaced regularly. Reel Tech supplies a complete range of Hannay Stainless Steel hose reels for any food industry application requiring robust construction, safety and corrosion-resistant properties.

In sanitary or harsh environments, the stainless steel reels offer protection against contamination and corrosion. The reels ensure no paint flaking or rusting, making them suitable for food and beverage, dairy and pharmaceutical industries. Applications include chemical transfer, washdown, potable water and more.

The stainless steel reels are used to transport filtered water for fermentation processes, proofing and general sanitation, maintaining cleanliness and safety. Their stainless steel construction is suitable for the beverage processing.

Various models of the reel are available and handle 1/4" to 1" hose diameters. They are available with either spring or manual rewind functionality.

To minimise the chance of employee and equipment damage due to excessive hose 'speed whip' during rewind, Reel Tech also offers optional Safe-R-Reel, an add-on rewind speed control system designed for Hannay spring reels. The maintenance-free Non-Belt/Chain Direct Drive System ensures a controlled speed during rewind to reduce hose handling injuries. Safe-R-Reel can be optioned in full stainless steel that is chemically resistant, robust and durable, with a high level of safety.

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## Non-intrusive temperature instrument

Emerson Automation Solutions has introduced its X-well Technology with a Rosemount 3144P transmitter in addition to its original WirelessHART X-well Technology to extend this non-intrusive temperature sensing technology to a conventional wired I/O environment.

Users have found X-well to be a useful replacement for difficult thermowell installations, which often have

a wired connection already available and can be re-used with the wired version of X-well. The technology works by measuring the pipe surface temperature and ambient temperature, combining this information with an understanding of the thermal conductivity properties of the installation and process piping to produce a process temperature measurement.

The technology provides process temperature measurement without requiring any intrusions or penetrations into the process, allowing for quick and easy installation along with simplified long-term maintenance. Users do not have to design, size or maintain thermowells. Wake frequency calculations are eliminated, as well as time spent determining material compatibility, the right insertion length and the necessary profile.

Applications that can benefit from the technology include pipelines, small line sizes, high-velocity flows, slurries, heavy particulate fluids, wellheads, clean-in-place processes, high-viscosity fluids and harsh processes in the oil and gas, chemical, refining, food and beverage, metals and mining, pulp and paper, and other industries.

With X-well Technology, users can also add temperature measurement points without having to shut down a process. X-well Technology instruments can be installed with a standard pipe clamp procedure and ordinary hand tools.

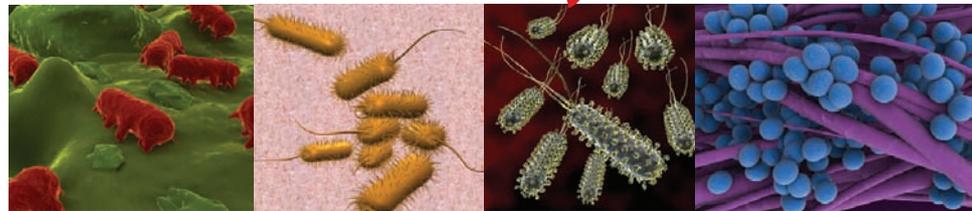
Pairing an X-well Technology pipe clamp sensor with the 3144P transmitter combines the versatile sensing technology with a widely used temperature transmitter. Users can now quickly add temperature measuring points wherever they can provide the greatest benefit and choose between a conventional wired or a WirelessHART connection.

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# Self-learning machines and smart robots are coming to an industry near you

Andreas Wartenberg\*

**Artificial intelligence (AI) gives computers humanoid and cognitive abilities that can lead to an increase in productivity. In addition, machine learning (ML) systems can be employed to assess problems and needs and resolve them accordingly.**

In recent years, extensive progress has been made with artificial intelligence: Watson, Siri and deep learning are just a few examples which show how AI systems can now perform services which can be classified as intelligent and creative. Companies that want to optimise their business or save costs will hardly be able to dispense with artificial intelligence. A computer, much like a human, saves knowledge gleaned from experiences and can then independently derive solutions — based on algorithms — to new and unknown problems. To do this, a computer program

analyses samples and, using self-learning algorithms, tries to recognise certain patterns and regularities in the data.

## **AI systems are, without a doubt, extremely useful**

The world is becoming ever more complex, meaning that a well-thought-out and wise use of our human resources is required. This is where high-quality computer systems can help. It also applies to applications that require intelligence. The downside of AI is that the possibility of intelligent machines is something that scares many people who argue that intelligence is something unique, something that sets *Homo sapiens* apart from mere machines.

The quest for an artificial copy of man and the issues associated with this are not entirely new. Our ancestors already invested much thought in the reproduction and imitation of thinking.

Economists expect that this technology will greatly increase prosperity. Previous studies have been restricted to investigating the impact of intelligent automation; for example, when machines in networked factories communicate with each other or when autonomous vehicles transport goods or people without drivers. This view, however, neglects other

growth-stimulating effects of intelligent systems: artificial intelligence will support people in their work and make them more productive.

### Economic growth through AI

According to a recent study by consulting firm Accenture, artificial intelligence will give the German economy a huge growth spurt. Many work processes will become more efficient and staff will be able to focus more on tasks with a high value added, as machines and programs take care of many routine activities formerly dealt with by not only assembly line workers, but also knowledge workers. According to a different study by McKinsey, the global market for AI services has an annual growth rate of up to 25% and is projected to be worth around €25 billion by the year 2025.

Machine learning is becoming more and more mainstream. While self-learning programs were only to be found in universities, research institutions and some technology companies up until a few years ago, nowadays they are finding their way into ordinary products and solutions. Our everyday lives and our business lives are increasingly being determined by intelligent programs that learn from data and extrapolate from what they have learnt.

Speech recognition on mobile phones, for example, is essentially controlled by machine learning algorithms — much like the spam filters in PCs and notebooks or face detection in the management of photos. We are often in contact with learning systems without being aware of it — such as personalised online advertising. More and more companies are recognising the value of machine learning when it comes to optimising their business and saving costs.

### What work is left for the people?

Although robots can take over communications, computing and thinking,

there will be limits even here. There will be still be the need for highly qualified professionals, such as engineers, architects or judges. Also, tasks which rely on dexterity beyond that of robot fingers will remain for the foreseeable future.

Machines cannot replace the emotional intelligence of a person. Occupations that require social skills or creativity or represent a high-quality personal service cannot be substituted by AI.

Certainly, some professions will disappear completely and, in many areas, the requirements will change greatly. However, there is no need to panic just yet.

### Flexibility is needed

Tech companies such as Apple and Microsoft want to automate as many working processes as possible with learning machines.

The employees of tomorrow must be more flexible, because in the future man will have to adapt to the computer and not vice versa.

Employees will have to adjust to more flexible working practices: a fixation on permanent locations and times is often no longer required. This implies more flexibility and freedom on the one hand; but on the other hand, that work and personal time will intermingle.

In addition to the technical expertise, specialist and managerial staff must bring a more in-depth process knowledge and have a higher willingness to undergo independent and ongoing training in the appropriate technologies. What

is more, a good understanding of all security-relevant questions relating to IT technology and legal security will be a basic requirement.

### New careers in IT

According to Bernhard Rohleder, managing director of BITKOM, new, exciting

and challenging jobs will be created. However, they require a good education and offer much creative freedom and responsibility.

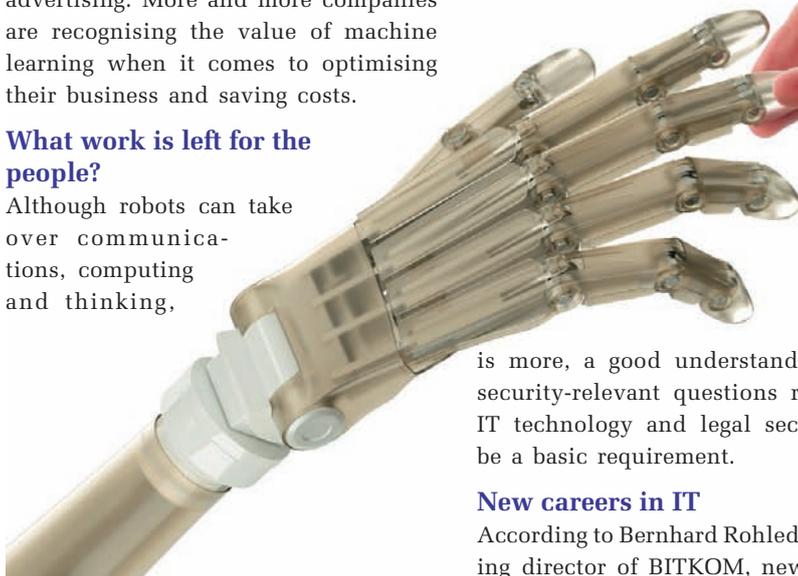
The number of workers with low-grade qualifications will fall, but staff with correspondingly high, mainly digital skills are now already increasingly in demand. The number of employees in the IT industry has been increasing continuously for years, as do the number of vacancies in this sector that are difficult to fill.

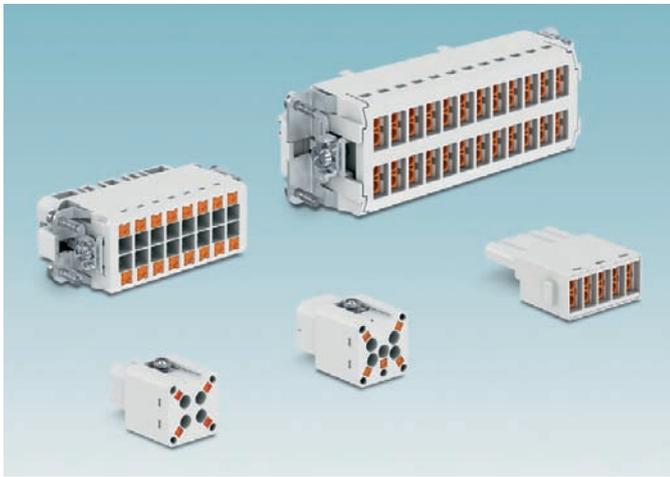
And there's more: even if artificial intelligence means that we are talking about machine learning, a harmonious combination of machine and human intelligence working as a single unit is required to develop theories and to confront new challenges. Working on the basis of the existing data, it is possible to develop company-specific business ideas, whether in the form of products, processes or new data-based business models.

### Conclusion

Artificial intelligence will bring about a tremendous shift in the labour market. The important thing is to remain flexible and open to new ideas.

*\*Andreas Wartenberg has been an executive search consultant for nearly 25 years, filling management positions in the technology sector and other industries. Wartenberg set up and led national and international teams before joining Hager Unternehmensberatung as a Managing Director in 2008. He is a leading topic expert in the DACH region in regards to all aspects of technology management and digitalisation within all type of corporations. Since early 2015 the Hager Unternehmensberatung has become a partner of Horton International. Wartenberg is currently Chairman of the Board at Horton Group International.*





### Push-in contact inserts for heavy-duty connectors

Phoenix Contact has released the PT-TWIN Push-in contact inserts for heavy-duty connectors.

In addition to offering Push-in connection technology, the device comes with a double conductor connection. This feature provides additional user convenience as two conductors can now be wired into one contact point quickly and easily to save time. The double conductor connection also eliminates the need for an additional marshalling level, further simplifying the installation process and minimising the time required. This simplifies the connection process for the user and ensures greater choice.

Created for fast assembly, the device features tool-free installation. The technician pushes the wires in, thereby setting up the connection, and then places the contact insert into the connector, making the process hassle-free and quick, to help save on time.

Suitable for control and power transmission, the unit also provides user flexibility, as it is available with a fixed number of positions and in a modular design for series B housing.

To ensure a high level of performance, the inserts are shock and vibration resistant. They are also safe to use and operate, and meet all required standards.

**Phoenix Contact Pty Ltd**  
[www.phoenixcontact.com.au](http://www.phoenixcontact.com.au)

### PC-programmable Modbus temperature transmitter

Moore Industries' TMZ Dual (2TPRG) PC-programmable Modbus temperature transmitter allows users to increase density with dual RTD, thermocouple, mV, resistance or potentiometer inputs by doubling temperature monitoring capability in a single unit. The two independent sensor inputs are easy to configure using a free copy of Intelligent PC Configuration software available for download from the company website. The data from both sensors is available on the Modbus output, allowing the host to use the data for averaging, differential or sensor backup.

Up to 32 (without repeaters) TMZs or TMZ Duals can be multiplexed onto a single communication link (such as a twisted wire pair), eliminating the need to run a dedicated wire for each signal. The transmitter provides increased sensor density, delivering even more savings on installation, cable, conduit, connection and wire tray costs.

The product features long-term stability (five years), 20-bit input resolution, isolation and RFI/EMI protection. Since the measurement is delivered to the user's control system as a digital signal, the output error produced by a traditional analog transmitter is eliminated.

**Moore Industries Pacific Inc**  
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# Off-grid winery GOES GREEN

Already a certified organic and biodynamic vineyard, Cape Jaffa Wines has responded to its customers' expectations and committed to going 'green'.

Being away from the national three-phase power grid meant that the winery relied on load matched diesel generators for their three-phase power requirements. The winery office and cellar door were already solar powered but it had been thought that using solar power for the seasonal use of the winery equipment and refrigeration during vintage would not be economically viable. Another issue was ensuring return on investment when, as the winery is off-grid, there is no opportunity to sell any excess power back into the system. Applications for government grants for renewable energy had been unsuccessful because of these unique circumstances. However, as the costs of both solar and battery storage have reduced the business case has changed.

Cape Jaffa has now installed 297 solar panels on the winery roof with a capacity of 81 kW and 96 400 Ah lithium battery cells. This is expected to create an emissions savings of about 60 CO<sub>2</sub>e/year.

To better understand energy efficiency, Cape Jaffa went through the process of a detailed energy audit. Although the audit was supported by a government grant, there was no funding available to invest in the improvements recommended. Reducing usage, and in particular peak loads, became the focus and substantial savings were achieved through a number of changes to the process.

The winemakers began co-inoculating for secondary fermentation to reduce requirements to warm wines and also moved away from traditional cold stabilisation. The expectation is that the new system will run carbon neutral operation for nine months of the year and a diesel back-up generator will occasionally be needed to top up the power supply during vintage.

Zen Energy supplied the lithium battery system and local electrician Anthony Moore and his team at Robe Electrical completed the installation.





## Valve actuator

Alfa Laval's Unique DV-ST UltraPure actuator is designed to fit all of its standard diaphragm valves. It simplifies inventory management and makes the specification process quick, easy and secure. Regardless of the process or application, the same actuator can be stocked as a spare part for all Alfa Laval Unique DV-ST UltraPure diaphragm valves.

The actuator withstands the high temperatures required for sterilisation. It operates at working pressures up to 10 bar (6 bar TFM/EPDM) and is able to close the valve at the same working pressures at 0% pressure drop.

Alfa Laval sensing and control units can be easily integrated with the actuator, which enables users to take advantage of the company's valve automation solutions. Alfa Laval sensing and control units feature tight tolerance bands to provide maximum process safety and no-touch, set-and-forget sensors with simple set-up. This minimises human error and promotes safe and efficient production, ensuring more uptime.

**Alfa Laval Pty Ltd**

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



## Antimicrobial food safety systems

The AutoJet Food Safety System from Spraying Systems Co ensures food safety through minimisation of contamination, while extending product shelf life.

Delivering exact application and uniform coverage of antimicrobials and sanitisers, the system also minimises waste. Consisting of an AutoJet spray controller and PulsaJet automatic spray nozzles fitted with UniJet spray tips in food-grade materials, the system is suitable for applying antimicrobial agents to bagged whole muscle products, formed products, fresh meats, packaged poultry and sliced meat products. It can be used for effective and repeatable sanitising of conveyors and surrounding equipment.

The systems have the ability to allow for numerous volumes of antimicrobial and sanitising agents to be used on a single conveyor line and can be easily incorporated into existing product lines. They have been proven to effectively control the prevalence of pathogens and are able to be incorporated into existing HACCP plans.

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## High-shear mixer

Tetra Pak has launched its next-generation high-shear inline mixer, offering high ingredient-mixing performance. Featuring a design that produces fine, consistent and stable emulsions, the R370-1000D reduces the need for downstream homogenisation and delivers a better quality end product, according to the company.

The mixer features the integration of a built-in deaerating system, a flexible powder introduction system and a redesigned mixing head. This allows the machine to handle high viscosities at up to 2,000 cP and break the size of the droplets to 1  $\mu\text{m}$ , significantly smaller than the industry average of 7  $\mu\text{m}$ .

The output of a finer, more consistent and more stable emulsion reduces the need for downstream homogenisation, a highly energy-intensive step in food processing. This means that it is now possible to eliminate the homogenisation step altogether in the production of certain types of ice-creams, cutting energy consumption by up to 50% in the overall process. The mixer can also handle ingredients with up to 65% dry matter — the highest concentration for infant formula production — cutting down the need for evaporation.

The mixing machine produces at a capacity of up to 30,000 L/h and can be applied in the production of liquid dairy and beverages, ice-cream and prepared food, as well as for most pre-mixing needs in food manufacturing.

**Tetra Pak Marketing Pty Ltd**  
[www.tetrapak.com/au](http://www.tetrapak.com/au)



## Check valve maintenance video

SPX FLOW's APV Delta RUF check valve maintenance video covers disassembly, seal replacement and reassembly of its APV Delta RUF Check Valve.

It is the latest in a series of easy-to-follow online tutorials designed to help reduce maintenance overheads and ensure continued smooth operation of production lines.

SPX FLOW offers a vast range of valves to meet wide application needs. All are designed to ensure trouble-free operation. As with any mechanical device, routine maintenance is required to keep units operating at peak performance and to maximise operating life.

The APV Delta RUF check valve is used where the prevention of backflow of product is critical to the production process. The non-return valve offers high operational assurance in a compact design and is widely used across the brewery, dairy, chemical and pharmaceutical industries. Designed for easy maintenance, the valve has robust bearings and profile seals that eliminate any gaps through which product could leak.

The SPX FLOW maintenance video walks the operator through every stage of valve disassembly, seal removal and replacement, and reassembly. It explains in detail the tools and processes needed to ensure correct maintenance without damaging the valve. These procedures aim to ensure continued operational safety and longevity of the valve.

**SPX Flow Inc**  
[www.spxflow.com/au](http://www.spxflow.com/au)

## ELF accelerometer

Dytran Instruments' model 7705A1 Extended Low Frequency (ELF) accelerometer combines both a piezoelectric and a variable capacitance MEMS element, combined as a single output, to create what the company claims is the widest frequency response bandwidth in the industry, from DC (0 Hz) to 10 kHz. The technology combines the high frequency response of piezoelectric sensors with the true DC response of variable capacitance accelerometers, eliminating the need for two different technologies to cover the bandwidth of interest in an application. Slow rotation speeds in the sub-1 Hz range and gear mesh frequencies up to 10 kHz can now be made using the same sensor.

The accelerometers are suitable for flight testing, ride quality, health and usage monitoring systems, wind turbine measurements, machinery monitoring and a wide range of structural response applications.

The product is offered with a 200 g range and operates on 5–28 VDC power at 7–9 mA of current. Signal/power is handled via a 4-pin M4.5 x 0.35 radial connector. The lightweight titanium housing weighs just 15 g and is hermetically sealed for use in rugged environments, from test tracks to outer space. The product incorporates a 10–32 tapped mounting hole and a hex base.

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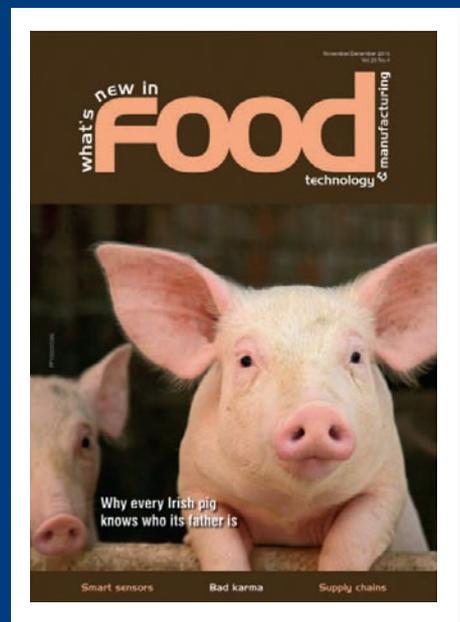
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what's new in  
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# Bulk handling

## Tetra Pak invests US\$110 million in an automated dairy plant

The demand for dairy products is increasing in Vietnam, and Vinamilk is capitalising on this by installing a liquid dairy plant with Tetra Pak's investment of US\$110 million. Ranking first in the country for manufacturing dairy products, with a 48.7% market share according to data from Nielsen, the company plans to continue to expand on a global scale.



The plant, also known as the Vietnam Milk Factory, is located in the Binh Duong Province near Ho Chi Minh City and spans 20 hectares. It is designed to process 400 million litres of milk per year, which highlights its sheer scale.

Vinamilk's chairwoman and general director, Madam Mai Kié Liên, explained: "This new plant has laid solid foundation for Vinamilk to achieve our goals to become one of the world's top 50 dairies, with over \$3 billion revenues by 2017."

As a stepping stone towards conquering this global market, the company aimed to produce a plant that was modern and technology-focused. Not only will the factory feature nine A3/Speed filling machines and eight A1 filling machines by Tetra Pak,

the most significant technology feature is the PlantMaster system. With all production equipment connected, this gives Vinamilk full control over all processes, allows them to trace products from end to end and reduces downtime.

"All of the individual machines are working together 'as one' to deliver optimal performance, with factory-wide integration ensuring high levels of efficiency and uncompromising food safety," said Bert Jan Post, managing director of Tetra Pak Vietnam.

Vinamilk developed from a state-owned enterprise and some revenues between 2008 and 2015 had a growth rate of 40%. The company's growth over the past few decades has been undeniable, and this is something it plans to continue with the development of the dairy factory.

With the help from Tetra Pak, Vinamilk's technology-first, large-scale factory aims to tackle the dairy market not just nationally, but internationally.

## Bulk bag discharging system

The BULK-OUT Bulk Bag Discharging system from Flexicon is designed for use in explosive environments. It features a pneumatically powered hoist and trolley to raise and position the bag inside the discharger frame, eliminating the risk of potential sparks from electrical equipment or fork trucks that might be otherwise used for this function.

A SPOUT-LOCK clamp ring forms a high-integrity, dust-tight seal between the clean side of the bag spout and the clean side of the equipment, while a TELE-TUBE telescoping tube maintains constant downward tension on the bag as it empties and elongates, promoting complete discharge of free- and non-free-flowing material from the bag.

The all-stainless-steel construction is designed to withstand corrosive environments and allows rapid washdown with caustic cleaning solutions.

The unit is available with a hopper and pneumatically driven flexible screw conveyor, a tubular cable conveyor or a rotary airlock valve to feed material into a pneumatic conveyor line.

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## World's largest poultry processing facility coming to South Korea

South Korean chicken processing company Harim Co is modernising its Iksan plant. The company processes nearly 120 million chickens annually, supplied by 600 nearby poultry farms, and employs 1900 workers across multiple plants in Iksan and Jeongeup.

### The plant upgrade

With two existing lines being overhauled and re-used and four new high-speed Marel Poultry lines being installed, the plant will be one of the largest poultry processing facilities in Asia. When the proposed seventh line is added it will be the largest facility in the world.

Marel's four new processing lines will be spread over five different floors in the fully modernised Iksan plant.

The new poultry lines will make use of Marel's latest technologies in scalding, defeathering, evisceration and chilling. The Stork Nuova, claimed to be the world's most efficient eviscerator with integrated giblet harvesting line, will be at the heart of the evisceration department. All four lines will include low-maintenance, self-calibrating, high-speed SmartWeighers.

### This is one tall plant

With land suitable for buildings at a premium in Korea, Harim has elected to construct a five-storey building, attached to the existing plant, extending its existing 80,000 m<sup>2</sup> production area to 150,000 m<sup>2</sup>. Spacious air chill tunnels, which use Stork DownFlow 'Plus' technology, will be positioned on the top floor.

An overhead conveyor system will distribute broilers to all departments, keeping all processes completely inline. The system features ATC (Automatic Tension Control) technology, which makes for increased reliability as well as reduced wear and tear. In Harim's Iksan plant, ATC allows a spectacular height difference of more than 20 metres to be bridged.

Innova food processing software will ensure the overall monitoring of all equipment installed in the Marel Poultry lines at Harim.

Because of the size of the plant, preventive maintenance is an important issue to protect the four lines from unnecessary downtime. During the first years, Marel Poultry's field service engineers will pay regular visits to the Iksan plant, a wish clearly expressed by the Harim Group.

Guests entering the plant will have an impressive experience. After an introduction movie about Harim in the company cinema, the film screen will lift to give access to the Harim museum and information centre. A 500 m-long visitors' corridor will show the production process and provide a complete overview of the poultry processing lines.

### Marel

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



## Air-cooled industrial water chillers

The TAEvo Tech range of air-cooled industrial water chillers with scroll compressors and R410A refrigerant has been expanded with two new models particularly suited to the food industry. The HE (high efficiency) and LT (low water/brine temperature) units expand the already wide technical equipment working range of the standard TAEvo Tech unit and ensure a secure, reliable and repeatable production process while saving users money and protecting the environment.

The TAEvo Tech chillers are compact units designed for use in industry, supplied with hermetic scroll compressors and the innovative finned pack evaporator installed inside the hydraulic storage tank.

The eco-friendly refrigerant R410A (ODP=0) ensures high performance due its heat conductivity properties.

The air-cooled chillers have a cooling capacity of 5–175 kW.

### MTA Australasia Pty Ltd

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



## Low-profile IBC discharger

Flexicon's BULK-OUT low-profile discharger positions intermediate bulk containers (IBCs) weighing up to 1450 kg in the frame using an electric hoist and trolley, discharges bulk solid materials into a surge hopper and conveys the material to a downstream process dust-free.

Lifting arms fitted with four eye hooks connect to the mobile IBC frame, which is equipped with four inverted cradle cups that mate with corresponding posts on the discharger frame for precise positioning of the IBC outlet.

When lowered into position, the tapered outlet of the IBC's butterfly discharge valve mates with a gasketed receiving ring on the lid of a surge hopper, allowing opening of the valve and discharging of material with no dusting.

The surge hopper is available with an integral flexible screw conveyor, tubular cable conveyor or pneumatic conveying system also produced by the company.

The purpose-built stainless steel IBC hopper frame measures 914 mm square by 965 mm high and includes two swivel and two rigid castors with brakes. Quick-release clamps secure the hinged hopper lid during transport and discharge of material.

A port on the lid of the surge hopper is vented to a BAG-VAC dust collector that puts the sealed system under negative pressure, preventing displaced air and dust from entering the plant atmosphere.

All material contact surfaces of the system are of stainless steel with the exception of the flexible screw conveyor's polymer outer tube.

**Flexicon Corporation (Aust) Pty Ltd**

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# Better food businesses through BIM

**Building information modelling (BIM) is of great value to food facility operators throughout the life of a facility. From the first idea of a facility through to concept development, design, engineering, procurement, construction, commissioning, training, operation, maintenance and futureproofing your facility, BIM can deliver immense value.**

**M**any food facility stakeholders are becoming increasingly engaged with 5D BIM in particular and are extracting great value from it. 5D BIM is an information model that takes the 3D virtual model and adds in a time dimension (4D) and a cost dimension (5D). There are other dimensions to BIM that provide platforms for managing issues like services, data and maintenance that can lead to a complete food facility management solution.

A good BIM approach is an all-encompassing database of all the relevant information relating to a facility. In other words, BIM is an information model that stakeholders can and should use. BIM provides a system on which alternative operating and commercial scenarios can be analysed and business decisions can be more effectively made.

The value that can be extracted for a food facility operator, from the board down, includes the ability to:

- access more information in real time
- make clearer, better informed decisions
- accurately inform strategic recommendations across the business
- test alternative operating and commercial hypotheses and analyse the potential outcomes in a virtual environment

without the risk of experimenting in the real world (particularly if that world does not exist).

It is important for all stakeholders to understand how a well-developed BIM model will integrate with emerging technologies such as augmented reality and automation. For example, imagine a scenario where your complex food facility had a technical issue that required the input of a specialist (analysis, repair or training) located on the other side of the world. With a well-developed BIM model, that specialist could provide input in real time just like they've teleported there instantly.

Wiley believes in and practises a people-centric design-build approach. The company knows that successful facilities are created using highly collaborative and integrated BIM tools. It offers high levels of collaboration, visualisation and communication between key stakeholders throughout the design, delivery and operational life of the facility. The more complex the facility, the greater the value.

In the end, applied well, BIM provides all stakeholders with a better food facility and a better business.

**Wiley & Co Pty Ltd**  
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## LED bar work light

The QMFL is an LED bar work light from Qlight that has an epoxy sealed structure that provides oil resistance in environments such as machine tools with cutting fluids.

These work lights are suitable for high-temperature and high-pressure washdown with an IP69K rating, with the fascia made of tempered glass to prevent damage from accidental machine tool chips. Its strong design provides resistance against impacts and vibrations. Even in harsh environments, such as with dust/dirt and cutting fluids, it performs well.

With the inclusion of a bracket, it has a tilt adjustment with an angle of 120°. The user can select from a variety of body lengths of 200/300/400/500/600 mm to fit their application needs. The light is also equipped with an anti-glare filter, suitable for places that require stable illumination.

For the cable entry structure, the user can select between external cable type (standard) and an M12 connector type (customised). For the external cable type, a customised oil-resistant cable is available.

The ambient operating temperature ranges between -30 and +60°.

**Leuze electronic Pty Ltd**  
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## Re-usable straps

VELCRO Brand LOGISTRAP straps enable quick and easy palletising of cartons to replace shrinkwrap and banding methods. The products are designed to provide savings in both labour and materials for many efficient and sustainable warehousing operations.

Made from woven hook and loop, the strap is soft to the touch and does not damage packaging. It also does not cover barcodes or other identifying labels, so warehouse scanning is not interrupted.

The straps are secured and released easily and quickly, with no special equipment. They are available in lengths of 5 m in 50 and 100 mm widths, each with a minimum breaking strength of 1 kN.

**Velcro Australia Pty Ltd**  
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BULK HANDLING

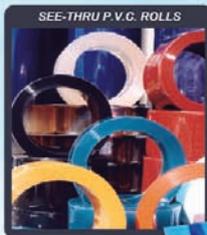
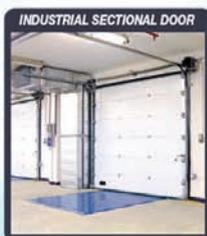
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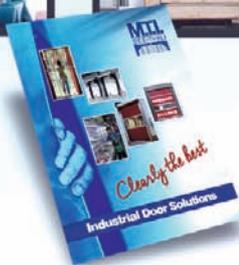
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## Bulk bag unloader

National Bulk Equipment's Bulk Bag Discharger with integrated clean-in-place (CIP) features is designed to speed changeover during sanitary process operations.

The process-specific bulk bag unloader with chain-style tubular drag conveyor is engineered and built to withstand rigorous duty cycles and stringent process demands. Process requirements include a target material infeed rate of up to 13 t/h and frequent changeovers that demand system-wide cleaning to microbiologically safe levels.

The bulk bag discharger uses two integrated hydraulic massage paddles, each with 997 kg of paddle pressure, to condition the material and aid material flow. The material flows through the NBE E3 enclosed bag spout interface where the closed-cycle dust collection system filters migrant material generated during bag unloading and reintroduces the material back into the process flow. The E3 also works during bulk bag unloading to elongate the bulk bag, further ensuring complete material discharge.

Changeover times are reduced as a result of sanitary design features, including the elimination of internal angles, corners and dead spaces to reduce accumulation of contaminants as well as angled planes, rounded-radius framework, a 32 Ra finish plate and stand-offs to speed moisture run-off away from product contact areas. Subassembly access, removal and replacement is engineered to be completed as a single-operator, tool-less action that reduces time and labour per event.

The chain-style tubular drag conveyor minimises product breakage and degradation while providing a dust- and airtight material transfer method. Integrated CIP capabilities are provided by an automated CIP cart which enables a complete washing and drying procedure and aids in meeting regulatory requirements for food-grade system design.

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### Rod-end load cell

The FUTEK LCB200 Rod End Load Cell (tension/compression) is designed for applications involving inline actuators or hydraulic jacks with male/female threads. The load cell has low deflection and can easily thread in line into a threaded rod actuator.

It is built from robust 17-4PH stainless steel and weighs approximately 99 g. It is suitable for mid-range capacity requirements (453.6–1361 kg), offering high endurance.

The load cell features high stiffness, nonlinearity of  $\pm 0.5\%$ , bridge resistance of 1000 ohms and deflection of 0.001" nominal. It can be modified or customised to meet customer requirements. It utilises metal foil strain gauge technology.

**Metromatics Pty Ltd**  
[www.metromatics.com.au](http://www.metromatics.com.au)

### Spiral conveyor

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

The conveyors have a comparably small footprint and their ease of cleaning along with almost maintenance-free operation ensures they are suitable for a large variety of food production environments.

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

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

The product has no crushing points or exposed rotating parts. This creates a very safe method of conveying while keeping noise to a low level.

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

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### Contactless product conveying

Gebo Cermex's AQFlex is a product handling technology that offers agility and contactless product conveying and accumulation in a compact space.

The technology accommodates any product, whatever the application, whatever the market, in all container materials, formats and shapes, full or empty, while also enabling automatic changeovers via an intuitive and user-friendly human machine interface.

Care of product integrity is enabled by the single-lane, contact-free product handling and accumulation system that is able to process even fragile, unstable or premium containers.

The product can operate at any speed, from 1000 to 100,000 containers/h, delivering energy savings of up to 60%, without compromising high efficiency (99.5% even at high speeds) or sustainability, according to the company.

All the conveying functions of the technology, including contactless accumulation and multilane machine infeed, are regrouped into this single, universal, handling solution. As all conveying and accumulation is carried out as a single-file process, the usual peripheral conveying functions associated with mass accumulation — such as deceleration, de-grouping, combining and laning — are eliminated.

The company claims its compact design provides up to 40% space savings compared to traditional solutions and, as a result of its compact footprint, the product is easily integrated into existing production lines. It has a clear and open design that gives full accessibility at floor level for enhanced ergonomics and easy cleaning. Having only a few added mechanical parts compared to a conveyor, maintenance of the product is comparable to that of a standard conveyor — without the need for any lubrication.

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## Bag placer for valve bottom bags and flat valve bags

In order to increase the performance and efficiency of the BEUMER fillpac, BEUMER Group has developed the BEUMER bag placer for valve bottom bags and flat valve bags.

With its standardised modular design, the bag placer provides numerous set-up options. The user can set it up at any angle by adding an optional turntable for example. This reduces the required floor space considerably. The system is equipped with an ergonomic control terminal. The improved human machine interface concept makes controlling the bag placer easy and intuitive. It can also automatically adjust to different valve bag formats.

The drive unit and the gripping arm are driven automatically by servomotors, ensuring precise positioning and energy efficiency. The drive technology used in combination with the electric coupling of both servo drives of the gripping arm and the application unit minimises the number of necessary mechanical components. The kinematics also reduce the vibration of the machine, increasing its service life.

The operator can use this version for PP, PE and paper valve bottom bags. Bag lengths of 350–650 mm and bag widths of 230–550 mm are possible as well as valve widths of 80–160 mm. The system can handle 3000 bags/h; the high-capacity version up to 6000 bags.

In order to considerably reduce its footprint, the bag placer can be set up at an angle of up to 60° by using the optional turntable. The product is used for woven PP and PE bags with lengths of 600–800 mm, widths of 400–550 mm and valve widths of 125–150 mm. Its capacity is up to 2400 bags/h.

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# Controlling rising energy costs with VSD



Whilst a majority of food processing plants use compressed air as their major power source, many are unaware of the significant cost and the potential energy savings that can be achieved through the application of variable speed drive (VSD) technology, which can lower the cost of compressed air by as much as 35%.

Energy expenses contribute more than 70% of the long-term cost of owning an air compressor. Over the life of a compressor, energy costs will add up to many multiples of the original equipment investment. Often, much of this energy is wasted through inefficient part load controlling of the compressor.

During production periods, air demand can vary considerably. Using variable speed drive technology to match compressor output to demand, excessive energy consumption caused by wasted 'off load' power can be reduced.

As wasted energy is reduced, savings of as much as 35% are possible. Significant energy savings will generally result in the additional cost option of a variable speed drive typically being recovered very quickly.

## VSD — controlling your energy costs

In VSD systems, the compressor rotational speed is automatically adjusted to match output to demand. The compressor carefully

varies its output, as demand constantly varies throughout the production period. The system pressure is maintained at a constant set point, which is lower than that of a fixed speed compressor, saving additional energy.

Key features of a VSD compressor include:

- Gradual motor speed ramp-up, eliminating starting current spikes
- No limitation on the number of motor starts
- Excessive part load energy consumption eliminated
- Steady system pressure
- Lower plant pressure, reducing artificial air demand
- Reduced plant leakage due to lower system pressure
- Reduced noise levels
- Wide turndown range

## Networking for up to 16 compressors

On board every SCCA VSD compressor is a PLC-based controller that takes care of both the compressor functions and the integrated Schneider Altivar 61 inverter. The controller also offers networking capabilities for up to 16 compressors. The speed of the motor and direct-drive air-end combination are controlled to exactly match output to demand at steady pressure. At part load, compressor shaft power varies almost linearly with demand. The inverter is independently cooled, allowing operation in ambient temperatures up to 50°C. The Altivar 61 is protected against damage from dust and moisture in the harshest environments.

**Southern Cross Compressors (Australia) Pty Ltd**  
[www.southerncrossairccompressors.com.au](http://www.southerncrossairccompressors.com.au)



## Submerged aerator wastewater pumps

Tsurumi's TRN submerged aerators mix the tank and add large quantities of oxygen. They do not require membrane jets, which means they cannot become blocked. This allows breweries, producers of mineral water and dairies to satisfy the discharge limits.

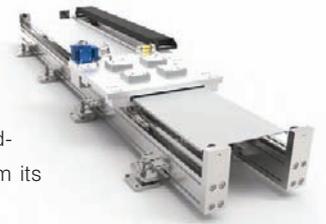
The oxygen bubbles required for the biological preclarification phase are generated by means of rotation. Almost as a side effect, the content of the tank is kept in motion to prevent sediments forming. The fans do not require a compressor, nor do they need to be attached to the structure because they are simply lowered onto the base of the tank. Only a power cable, suction line and retaining chain are required. The shape of the tank is also irrelevant.

If several fans are used, the clarification process runs without interruption should one unit need to be removed. There are 10 models with motor outputs ranging from 0.75 to 40 kW in the product range. The aerator adds up to 600 m<sup>3</sup> air/h. It is suitable for expanding capacity levels or as a backup for existing systems. It is also possible to use the unit together with aerators from other manufacturers.

**Australian Pump Industries Pty Ltd**  
[www.aussiepumps.com.au](http://www.aussiepumps.com.au)

## Motorised linear stage for robot applications

To extend the reach and versatility of modern robots, a motorised linear stage is often needed. Rollon Italy has now developed a standardised Seventh Axis system from its extensive linear product range.



Mounts are available for height-adjustable floor-, wall- and ceiling-mount applications. Larger sizes can be fitted with a walk-over plate. Energy chains come with all sizes.

Available in strokes of up to 46 m and with a total load capacity up to 2000 kg, the range features precision aluminium extrusions, rack and pinion drives, as well as mounting pads to suit common robots such as FANUC, MITSUBISHI, ABB, KUKA and NACHI. Units are supplied servo motor-ready to suit a wide range of manufacturers.

Designed around speeds of up to 4 m/s, acceleration up to 4 m/s/s and repeatability of ±0.05 mm, the products are suitable for robot OEMs and end users alike. The range can also be factory customised as needed.

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# Malt house retrofits 100 new drives



*An experienced supplier of malt houses, Czech plant manufacturer MOPOS has replaced and modernised eight turners for Saladin boxes.*

BULK HANDLING

In the selection and configuration of drives for the food and beverage industry, food safety is the most obvious major concern. Various other issues must also be addressed with common challenges including adverse environmental conditions that must be kept under control from the outset. NORD Drivesystems has configured clean and resilient systems based on efficient smooth-surface motors for a Czech malt house.

Traditionally, beer brewers used to prepare their own malt. Now, specialised malt houses often handle this job for them. The processes in these facilities are largely automated and carried out with state-of-the-art equipment. One large, modern malt house can be found in Nymburk, near Prague.

In the first phase of processing, grain is steeped in water until it is ready to germinate. Next, the grain is placed in a so-called Saladin box, where it sprouts leaves and roots. Enzymes are formed and enriched. They convert the starch into malt sugar. All the while, the grain is regularly raked and aired. After about five days, the green malt is transferred to a drying kiln.

## Retrofit with over 100 new drives

Before the advent of automation, turning the barley and clearing the malting floor were strenuous physical tasks that took many hours to complete. Modern malt houses have long ago switched to large mechanical turners, which enable production volumes of tens of thousands of tons per year. When the Nymburk malt house required a full-scale retrofit of these machines, they turned to Moravské potravinářské strojírna (MOPOS), a Czech OEM for the food industry with a particular focus on malt house and bakery machinery.

Eight turners, each over 7 m wide and weighing over 7.5 tons, were refurbished. A total of 120 drives had to be replaced with new, state-of-the-art systems. Each turner includes a main drive which moves the machine on rails that span the length of the Saladin box — over 53 m. These boxes are about 2 m deep. In addition, there are 14 individually driven vertical screws per turner. These rake the germinating grain once or twice per day as needed to keep it cool and aerated. Finally, a scraper mounted on the machine serves to discharge the green malt.

In this project, as the single source of drive solutions, NORD supplied 112 geared motors for the screw agitators as well as eight main drives with drive electronics for speed control. The drive manufacturer's Czech subsidiary, NORD-Poháněcí technika,

s. r. o., worked closely with its long-time customer MOPOS to configure these systems to suit the application.

The ambient conditions in the malt house are tough. The atmosphere is saturated with 100% humidity. Moreover, water vapour reacting with carbon dioxide also leads to the permanent presence of weak carbonic acid ( $H_2CO_3$ ). Given these very tough operating conditions, MOPOS selected smooth-surface motors. In contrast to conventional motor types, the casings of these motors have no cooling fins, which eliminates typical dirt traps and surfaces prone to attract condensation moisture. The standard versions of these systems already provide IP66 ingress protection. Their terminal boxes are filled with solid resin. Both the rotors and stators are treated with a special, moisture-resistant lacquer.

## Efficient thermal management

The smooth cases of the motors provide extra resistance against harmful influences as noted above.

However, this design requires careful thermal management, especially since the drives in the MOPOS machine run in continuous operation. The smooth-surface motors on the screw agitators feature a temperature sensor and a cooling fan. This allows for smaller sized motors without a risk of overheating. The motor on the main drive is non-ventilated and therefore solely cooled by surface heat dissipation. These motors are controlled by frequency inverters to be run at different speeds at various stages of the process.

Like all AC vector drives manufactured by NORD, the SK 500E units on the main drives use field-oriented vector control and partial load detection. Due to the harsh environmental conditions, the inverters are installed in a control cabinet.

## Sturdy, food-grade drive configuration

Robust BLOCK series parallel-shaft gearboxes were selected for the main drives. These multistage gearboxes feature a high gear ratio to enable slow and gentle agitation of the grain. The parallel-shaft gearboxes on the agitators are filled with a fully synthetic oil certified for the food industry. They feature stainless steel output shafts. They ensure corrosion resistance as well as high resistance against cleaning chemicals used in the facility. All drives were supplied with a special coating adapted to the wet environment in malt houses.

**Nord Drivesystems (Aust) Pty Ltd**  
[www.nord.com](http://www.nord.com)



### Safety laser scanner

IDEC Corporation has introduced the SE2L safety laser scanner, claimed to be the world's smallest and the world's first with master/slave functionality and dual protection zones.

Master/slave functionality allows one scanner to act as master and communicate with up to three other scanners. The safety controller only needs to communicate with the master, reducing the required number of input and communication channels on the controller. This can allow safety controllers to be used in applications such as providing full 360° protection for an AGV, which requires four scanners.

Dual zone protection allows one scanner to scan two adjacent zones simultaneously and independently, performing the work of two scanners for the cost of one. A common application is providing dual light curtain protection for two robots mounted side by side. In many applications, dual zone protection cuts costs in half.

**IDEC Australia Pty Ltd**  
[www.idec.com/australia](http://www.idec.com/australia)

### Positive-drive conveyor belting

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

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

The technology, combined with Volta's sprocket-driven Super-drive and DualDrive designs, incorporates strict hygienic standards with minimal maintenance and running costs, according to BMA, making it suitable for all unpackaged food processing conveyors. The integral teeth produced on the underside of the belt create a positive-driven, low-tension, 100% closed hygienic surfaced belt suitable for use in the food industry.

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# What you can do with 50,000 tonnes of mushroom waste each week

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In Europe, the Funguschain project seeks to obtain mushroom-based, high-value antimicrobial and antioxidant components from the 50,000–60,000 tonnes of mushroom waste generated each week. It is hoped that the innovative and sustainable compounds will have applications in a wide range of products such as antimicrobial and eco-friendly cleaning solutions for household products, bioplastics for bags, film and gloves, or enriched food supplements for the elderly and sportsmen.

Led by Dutch company BioDetection Systems, the project brings together a total of 16 partners including universities, research centres and companies from Spain, the Netherlands, Ireland, Germany, Italy, the United Kingdom, Belgium, Croatia, Sweden and Portugal.

The scientific committee of Funguschain is coordinated by University of Alicante NANOBIOPOL Group Director Alfonso Jiménez, who points out: “The project includes a four-year work and will lead to results that allow the integral valuation of mushroom residues and the resulting by-products.

“Our ultimate goal is to obtain high added value, sustainable and innovative compounds for cleaning products, enriched food supplements and bioplastics for bags, plastic films and gloves,” he added.

“The microwave-assisted extraction technique of antimicrobials, antioxidants, proteins, polyols and polysaccharides from the laboratories of the UA is being developed, which will be part of the subsequent processes for the cleaning, food and plastics sectors,” Jiménez explained.

Funguschain project is a new concept of biorefinery which will be created to valorise outcomes with a cascading approach, following these steps:

1. Microwave-assisted extraction — a fast and reliable extraction technique based on improvement in extraction kinetics provided by heating induced by microwave radiation. Results will be molecules such as antimicrobials, antioxidants or polyols which will be applied in further processes for the cleaning, food and plastic sectors.
2. Pressurised hot-water extraction — a powerful extraction technique using high pressures to maintain aqueous solvents in liquid state at high temperatures. Results will be bioactive proteins and polysaccharides that can be directly used as food supplements with enhanced texturing and prebiotic properties.
3. Saccharification fermentation — a deconstruction methodology of the biomass into a sugar platform, which constitutes the starting point for the production of fermented biopolyesters. The biopolyesters obtained from treated biopolyesters will be used to formulate new bioplastic blends. Biopolyesters will be produced using the sugar platform to formulate novel bioplastic blends in compounding facilities for the plastic sector.
4. Anaerobic digestion — remaining biomass will be dedicated to generate compost and biogas by anaerobic digestion. The result will be compost and biogas, which is produced by the breakdown of biodegradable waste inside a landfill due to chemical reactions and microbes, or as digested gas, produced inside an anaerobic digester.

The project, with a budget of €11 million, is co-financed by the Bio-based Industries Consortium under the European Union Horizon 2020 research and innovation program.

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## Pallet wrapping solution

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

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

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



## Stretch wrapper redesign

The Qimarox OEM stretch wrapper machine has been redeveloped from the standard machine.

The lack of a framework (in which the tensioning arms are traditionally connected) improves the flexibility of the design of the standard stretch wrapper. The position of the guideposts is determined in the project specifications, allowing the stretch wrapper to adapt to project specifications. This opens up the possibility of processing pallets from two different directions, allowing the machine to be used in corners. The design is furthermore standardised and the machine fully modular, making the stretch wrapper suitable for many different projects.

Qimarox supplies the stretch wrapper to specialised and trained certified system partners without a control system. These system partners can combine the control system of the machine with other end-of-line packaging system components.

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## Jellyfish crisps: the snack that will curb problematic numbers

With an increasing number of jellyfish swarming the sea, scientists have found a new method of controlling these 'blooms' — jellyfish crisps.

The benefits of using jellyfish to create this unusual snack would be felt by fishermen especially. The high numbers of jellyfish weighing down fishing nets require fishermen to empty their nets into the sea and therefore lose their fish.

A gastrophysicist from University of Southern Denmark (SDU), Mie Pederson, worked alongside SDU researchers Jonathan Brewer, Lars Duelund and Per Lyngs Hansen to create a more efficient process to dry out jellyfish, therefore curbing this problem. The results were published in *The International Journal of Gastronomy and Food Science*.

Although hundreds of dried jellyfish are produced every year, with the sea creature being a delicacy in Asia, the drying process takes between 30 and 40 days to make them consumer-ready. Traditional processing plants use kitchen salt and alum to remove excess water, and the jellyfish are continuously moved to different tanks during this process. However, Pederson's research has reduced this to a couple of days.

Comparing jellyfish to a gel, Pederson explains the dehydration process that creates the crisps.

"Gels respond differently when put in different solutions. In alcohol some gels simply collapse, and that is exactly what we see a jellyfish doing. As the jellyfish collapses, the water is extracted from it and its volume is reduced."

By soaking the jellyfish in alcohol, the water is extracted and this replaces the gummy consistency with a thinner, crunchier alternative, making it the perfect snack.

Although the jellyfish crisps are not distinctive in taste, it has been suggested that further flavouring using alcohol may be developed.

"The mouthfeel and the aesthetic appearance in particular have gastronomic potential," said Pederson.

The snack also boasts some health benefits, with scientists claiming it could be a healthier alternative to regular potato crisps. A 25 g portion of crispy jellyfish contains 0.5 g of fat, compared to 8 g in a bag of ready salted crisps.

The high levels of selenium present in jellyfish also fight the ageing process, preventing oxidative stress and defending against prostate and colon cancer.

However, one bag of jellyfish crisps surpasses the recommended daily intake of salt, which scientists are hoping to address in the future.

With Pederson's drying technique, jellyfish crisps could not only please angry fishermen battling with the rising numbers of jellyfish, but also break into the western food culture as a healthy snack.



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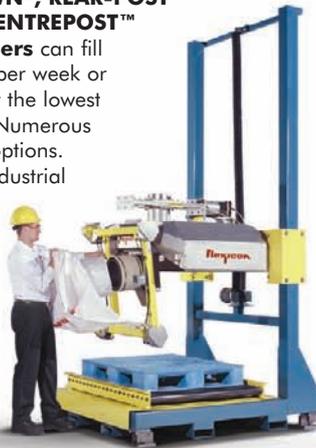
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