May/June 2016
Vol.24 No.1

what's new in FOOD technology & manufacturing

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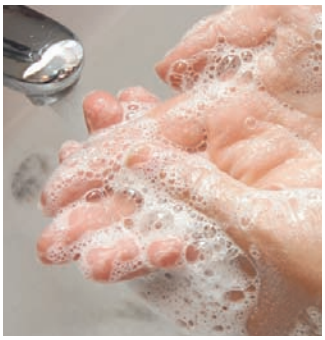
May/June 2016



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READ ONLINE!

This issue is available to read and download at

www.foodprocessing.com.au/magazine

Must-attend event

What: Food Technology Queensland 2016
Where: Brisbane Convention & Exhibition Centre
When: June 26 to 28
Pre-register: register.foodtechqld.com.au

Brisbane Conference and Exhibition Centre — Grey Street exterior

Everything you need to know about the latest trends, equipment, technology and ingredients for the food and beverage industries will be on display in Brisbane this May at Food Technology Queensland 2016.

Everyone who is anyone in food and beverage processing and manufacturing will be there and entry is free if you pre-register at https://register.foodtechqld.com.au.

At Foodtech Queensland 2016, you'll find everything you need for your food production line, including:

Food processing
- Food processing equipment
- Slaughtering equipment
- Conveying
- Vacuum equipment
- Robotics
- Filters
- Weighing
- Raw materials

Ingredients
- Ingredients
- Additives
- Flavours

Packaging
- Food packaging
- Labelling
- Canning
- Barcoding

Plant equipment
- Air conditioning
- Heating
- Food storage
- Refrigeration
- Lighting
- Flooring
- Safety equipment
- Waste solutions
- Cleaning
- Hygiene

Science and technology
- Scientific and lab equipment
- Inspection equipment
- Testing equipment
- Monitoring

Go to the 49th annual AIFST Convention at the same time

As an added bonus, the Australian Institute of Food Science & Technology will hold its annual convention alongside the event. The 49th annual AIFST Convention is focusing on 'The Pulse of the Industry', ensuring the latest trends, innovations, technologies, challenges and opportunities are explored.

Some of the program highlights include:

- Phil Ruthven, IBISWorld: Macro trends driving the food industry
- Alistair Mclachlan, Preshafruit: High pressure processing
- Elliot Chapple, Pozible: Driving digital innovation through crowdsourcing
- Maja Christiansen, Bruker: Mass spec and the confirmation of microbiological pathogens
- Josh Hemelaar, Gelita: Collagen — High value protein products
- Glen Neal, FSANZ: FSANZ Responses to the changing regulatory landscape
- Ben Lyons, TSBE & Food Leaders Australia: Australia's direct export opportunities
- Andre Teixeira, CSIRO: Challenging the innovation thought process

Visit www.aifst.asn.au to see the whole program and to register to attend.

Technology and new developments are crucial to the food processing industry and to take advantage of these you have to know about them. FoodTech Queensland will be a great place to get your finger on the pulse of what's now and what's next.

BYE BYE X-RAY

Introducing an *'INDUSTRY FIRST'* Metal Detector, capable of checking for metal and OXY ABSORBERS at the same time.

More *cost-effective* than X-ray technology, A&D's EZI-Check Metal Detector now ticks all the inspection requirements for food manufacturers with highly metallic Oxygen Absorption Sachets in their packaging.

- ✓ Check for metallic contamination
- ✓ Check that the OA pouch is present
- ✓ Check for **BOTH** at the same time with **ONE** detector

Our specialised Analog to Digital filtering (that's what A&D means!) provides a welcome alternative to X-Ray Inspection technology and can be deployed with any of our checkweighers for a complete inspection solution.

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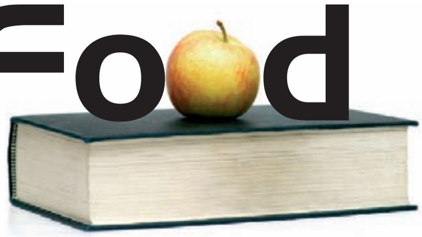

Food FOR thought

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What's the price of food and drug safety?

Just a tick over US$5 billion — that's the budget the US Food and Drug Administration is requesting for 2017. The total includes more than US$200 million for the continued implementation of a new food safety system — the Food Safety Modernization Act (FSMA).

The FDA has finalised major rules that implement the core of FSMA, the most sweeping overhaul of the country's food safety system since the first federal food safety law was passed in 1906. The 2017 budget builds on this work by supporting federal and state efforts to establish enforceable safety standards for produce farms. Funding also will enable the FDA to continue progress to hold importers accountable for verifying that imported food meets US safety standards, as well as conduct food safety audits of foreign food facilities.

The budget also includes funds to address public health safety concerns associated with antimicrobial drug use in animals to better protect antibiotic effectiveness for both human and animal populations; for supporting animal drug and medical device review; and more than US$3 million to be invested in the FDA's infrastructure to enable the agency to carry out its mission and respond to food safety and medical product emergencies.

© iStockphoto.com/Wittelsbach bernd

Robot-run lettuce farm to open in Japan

A Japanese farm will replace farm workers with robots, producing 50,000 lettuces per day while dramatically reducing labour, energy and water costs.

Dubbed the Vegetable Factory, the vast indoor farm, run by vegetable producer Spread, will use industrial robots to carry out tasks ranging from replanting young seedlings to watering, trimming and harvesting crops. Initial seed planting will still be performed by humans. The new farm is an extension of Spread's existing Kameoka farm and will use technologies such as automated cultivation, water recycling systems, specialised LEDs and an air-conditioning control system to cut labour costs by 50%, energy costs by 30% and construction costs by 25%.

The plant's recycling, filtering and sterilisation system aims to recycle 98% of the water used and reduce the amount of water required to 0.11 L per head of lettuce, compared with 10.725 L per head in conventional farming, according to the company. The produce will be grown on floor-to-ceiling shelves.

GS1 Australia upgrades product recall portal

GS1 Australia has launched a new version of its electronic product recall notification management system.

GS1 Australia's Recall service is an online portal that streamlines the management of product recalls by enhancing the speed, efficiency and accuracy of the recall process.

Initially launched for the food and beverage industry in 2011, the Recall online portal was rolled out to the healthcare sector in 2013 and the general merchandise and apparel industry in 2014.

The enhanced version has been developed in response to user feedback, offering new features including a more intuitive interface and improved functionality to streamline the recall of products and protect the reputation of affected brands.

© Baloncici

New appointment to drive food safety initiatives at SAI Global

SAI Global has appointed Dawn Welham as global technical director and thought leader as the risk management company continues to expand its expertise in the retail, food and agribusiness industries.

With a wealth of experience across food product safety, public health, consumer protection and occupational health and safety, Dawn is a key appointment for SAI Global. Focusing on technical leadership, she will help drive existing retail, food and agribusiness expertise across 100 countries, with a focus in Asia-Pacific, the Americas and Europe, and continue growing the company's capabilities in product safety.

The rapid globalisation of supply chains is increasing compliance and the need to get smarter about sustainable food production. Food provenance, safety and integrity are becoming more important to consumers and, in response, businesses are focusing more on embedding product safety processes and culture.

Dawn is a seasoned industry professional, with much of her experience driving technical leadership for businesses, including UK supermarket giant ASDA. Her roles there included head of trading law and technical director, where she was responsible for guaranteeing the safety of the 750,000 products sold across the supermarket's 500+ stores.

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Dawn has a BSc in environmental health from Manchester University; a Postgraduate Degree in Environmental Health & Occupational Safety; and an MSc in Occupational Safety and Health. She is also a Fellow of the Chartered Institute of Environmental Health, Chartered Practitioner of IOSH and member of the IGD's Technical Leaders' Forum. Previously, Dawn was a board member of BRC International Advisory Board.

Tomato farm powered by sunlight and seawater

A refrigeration company is using the skills and knowledge gained from chilling wine to help grow tomatoes on the edge of the Australian outback.

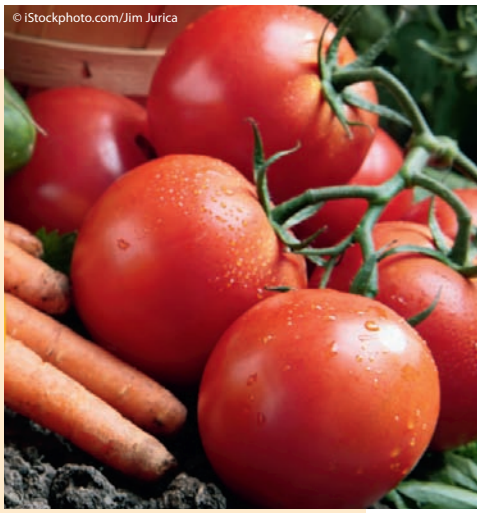
Cold Logic has won a $1 million contract to refrigerate desalinated water at Sundrop Farms' 20-hectare sustainable greenhouse facility in Port Augusta, about 300 km north of Adelaide.

The sustainable farm is powered by a solar-thermal desalination process using two abundant fuels: sunlight and seawater. Computer-controlled mirrors focus sunlight onto a tower to superheat the seawater and convert it to steam. The steam drives a turbine to generate electricity, desalinate the water and power the farm.

The desalinated water is used to irrigate the tomatoes — and that's where Cold Logic comes in. Cold Logic Partner Eddie Lane said his company had developed a system using ammonia technology to chill more than 2.8 million L of water/day.

He said the processed water was about 35°C after it had been desalinated.

"Our component really is to make sure there is an effective water supply at the right temperature that can be sent via the pumps to the greenhouses," Lane said.



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Food FOR thought

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Latest anti-dumping decision welcomed

An announcement that the Australian Government will apply dumping duties on all canned tomatoes from Italy has been applauded by key industry bodies. The Australian Food and Grocery Council welcomed the announcement, citing high and rising input costs, retail price deflation and high compliance costs as factors that were placing pressure on Australia's food and grocery processing industry.

"In this environment the threat of product dumping is a serious issue warranting the tougher anti-dumping measures introduced by the federal government. Today's decision by the Australian Government sends a message to our international competitors that Australia is not an easy target for dumping goods," said AFGC Chief Executive Officer Gary Dawson.

In its submission to the Anti-Dumping Commission, AFGC member company SPC estimated that from 2010 to 2014 the processed tomato industry in Italy received more than €900 million (approximately AU$1.2 billion) in subsidies through programs under the EU's Common Agriculture Policy.

Dawson said the dumping decision recognised the impact of these subsidies on the Australian agri-food sector. "Australia is regarded as a high quality, safe and premium food producer. The food industry and the growers supplying it want to compete with international manufacturers and producers on a level playing field. This type of action gives our food processors and growers the opportunity to do just that," said Dawson.

The Australian Made Campaign also welcomed the penalties imposed by the Anti-Dumping Commission.

"Consumers in Australia prefer Australian Grown produce and this should not be distorted by ridiculously unfair pricing," said Australian Made Campaign Chief Executive Ian Harrison.

"It makes no sense for the great produce grown in the Goulburn Valley and processed by companies such as SPC Ardmona to lose out in the marketplace against illegally dumped products."

A previous anti-dumping investigation into canned tomatoes found that 103 of the 105 exporters from Italy were illegally dumping products in Australia and duties were applied. The recent decision applies duties on the remaining exporters: 8.4% on Feger tomato products and 4.5% on La Doria tomato products.

Australian vegies could be feeling cosier this winter

Australian vegetable growers could be wrapping up their precious produce this winter, with research showing commercial frost cloths, known as 'fleece', are an effective weapon against frost and low temperatures.

The study, conducted by Applied Horticultural Research, aimed to investigate ways for vegetable growers in Victoria, NSW and Queensland to protect their crops against extreme weather events without using full protective structures.

The fleece, which is made of spun bonded polypropylene, acts like a blanket over the crop, trapping the warmth from the soil, increasing humidity and deflecting sinking columns of cold air.

AUSVEG spokesperson Dimi Kyriakou said frost damage is a severe issue for many vegetable growers as low temperatures can severely impact the growth of winter vegetable crops, reducing the overall quality and yield of the end product while also prolonging the time to harvest.

"Many growers choose not to plant crops that are susceptible to low temperatures during winter. However, the use of frost protection materials such as commercial fleece may provide an opportunity for growers to address the demand in the market for cold-sensitive crops during the winter period," said Kyriakou, who added that the fleece can help young plants establish more quickly by protecting them from wind damage as well as insect contaminants during the coldest months of the year.

The researchers suggest the fleece material could be particularly useful for low-growing leafy crops, which are the most susceptible to frost and low temperature damage.

"Growers are always looking for ways to produce vegetable crops more productively and cost-effectively. As demonstrated in Europe, these commercial frost cloths are becoming more affordable and easy to apply, while also shortening the overall growth period and time to harvest," said Kyriakou.

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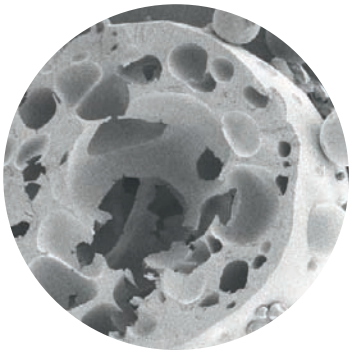


CSIRO drying technology a multimillion-dollar opportunity

A world-first technology, developed in Australia, and recently upgraded, could provide innovation opportunities for the food and beverage market, worth hundreds of millions of dollars.

Extrusion porosification technology (EPT), dries high-value, high-viscosity products, including concentrates high in fat and carbohydrate, that can't be handled by conventional spray drying.

The functionality of EPT powders is significantly higher than spray-dried products due to their porous structure, and the lower processing temperatures retain sensitive components such as flavours and nutrients while also saving significant amounts of energy. The process has been developed by French extrusion technology company Clextral, along with Australian food process company Inovo and CSIRO's food innovation centre.

The upgraded EPT line at CSIRO's food innovation centre in Werribee, Victoria.

Clextral's managing director, Melbourne-based Camille Challard, said the pilot-scale system, which had been tested at CSIRO's food innovation centre in Werribee, Victoria, for several years, had recently undergone a six-month upgrade. She said the line now offers many advanced features and opens up product development possibilities such as temperature-sensitive and sophisticated powdered mixes with additional functional properties, all in a food-grade environment.

The line also complies with the latest hygienic and safety requirements required by the dairy industry.

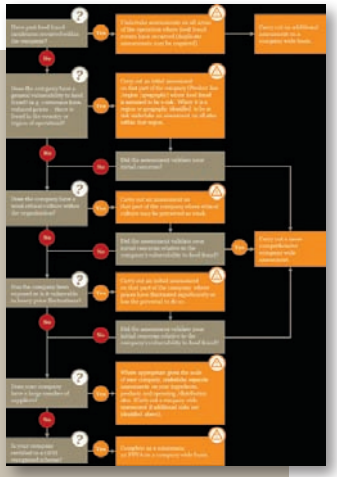
EPT offers companies the possibility of creating new products and ingredients that may not be able to be made using a conventional spray-drying process; for example, new flavours, nutritional powdered beverages, bioactives and highly aromatic products.

Existing products can also benefit from the process: when processed with EPT, coffee retains more flavour and aroma compared to spray drying, and powdered dairy proteins become more soluble. These were some of the applications piloted in collaboration with Food Innovation Australia Ltd (FIAL) through the Enterprise Solution Centre.

Australian company Flavourtech, based in regional New South Wales, is a commercialisation partner of the technology for tea and coffee globally.

The technology is expected to offer innovation opportunities in the manufacturing of foods and ingredients such as dairy powders, flavours, coffee, tea, nutraceuticals and beverages.

Free tool for assessment of food fraud vulnerability



SSAFE, in partnership with the University of Wageningen RIKILT, the Vrije Universiteit Amsterdam and PwC, has developed a free tool with a clear, robust and effective methodology to help food companies undertake food fraud vulnerability assessments.

The tool can help any company, irrespective of geographic location, size or type of food operation, undertake a food fraud vulnerability assessment and to prepare a control plan.

The tool is be available in three versions — in Excel, on the web and as an app — and is free of charge.

Food fraud is a growing issue facing the food industry today, especially in the current challenging economic times and with food supply becoming ever more global. Whereas the driver might be economic gain, food fraud incidents can lead to a public health threat. The Global Food Safety Initiative (GFSI), a key partner of SSAFE, has recently included new requirements in its Guidance Document that require organisations to have a documented food fraud vulnerability assessment procedure in place and implement measures to mitigate the public health risks that may result from the identified vulnerabilities.

The new tool refers to food fraud as intentional food adulteration (dilution, substitution, concealment, unapproved enhancements, mislabelling) and counterfeiting for economic gain only. This tool can support companies in the implementation of the new GFSI requirements for food fraud mitigation. The tool can be used to assess the vulnerability to fraud at an ingredient, product, brand, facility, country or company-wide level and, where applicable, major direct suppliers and customers. The following Decision Tree can be used help determine where to apply the tool. Visit www.ssafe-food.org to download the free tool.

what's new in Food technology & manufacturing

bulk handling

storage & logistics

Conveyor rollers with the smarts

Conveyor systems are ubiquitous in the food manufacturing industry, but how good would it be if conveyor rollers could communicate with each other and improve the speed and reliability with which goods are transported to their destinations?

Whether it's a pallet load of beer crates or a can of soup on its way through the factory, roller conveyors are used to transport all manner of things from A to B. Roller conveyor systems often form part of production lines where items are moved from one machine to the next so that they can be filled, processed, sorted, distributed or simply transported safely to their destination. These systems represent a significant logistical challenge — one that involves the complex interplay of numerous subsystems and one where there is a lot that can go wrong. A fault with only a few of the thousands of conveyor rollers can lead to an entire production line grinding to a halt or to suitcases ending up in the wrong plane. Today's roller conveyor systems are also restricted to predefined routes, making them quite inflexible as a result.

Now, a team of engineers led by Professor Matthias Nienhaus at Saarland University in Saarbrücken, as well as partners from Saarland University of Applied Sciences and industry, is developing smart conveyor rollers that can communicate with each other.

The team is working on a novel approach to the types of networked production systems envisaged in the Industry 4.0 framework. "Our focus is on the individual roller, which we equip with a drive motor and an intelligent controller. We are developing and testing methods that enable us to gather data from the drive motors," explained Nienhaus.

Conveyor rollers that are smarter than you are

Drive systems specialist Nienhaus and his partners are turning the motor inside every drive roller into a sensor. When the conveyor is running, the drive motors continuously generate data, which allows the rollers to be precisely controlled and thus respond to changing operating conditions. These intelligent roller conveyor systems can identify new routes if a fault arises or can flag up certain conditions, such as when there is space in a box for more cans. The project is now so advanced that the partners are ready to test the system at a large distribution centre.

Who's doing what

Nienhaus' research is centred on the specialist field of miniature electromagnetic motors and microdrive systems with power ratings ranging from a tenth of a watt to several hundred watts. As the system under development does not require any additional sensors, such as position sensors, it is remarkably inexpensive. There is therefore no risk of sensitive sensors becoming damaged or becoming unable to generate a signal for some reason. The researchers at Saarland University measure signals from specific locations

High-quality, affordable pallet ASRS
Reduced supply chain cost
Flexible, scalable & modular solution

It's challenging times for Food & Beverage and FMCG manufacturers with changing consumer behavior pushing inventory back down the supply chain. This is putting pressure on the storage, handling and transport of product and is creating a supply chain dilemma that is impacting profitability. Enter Dematic's new RapidStore pallet ASRS - a high-quality, affordable solution that secures product, reduces touches, and eliminates damage, whilst saving footprint, power, time and money. And it's backed by Dematic's unrivalled integration experience, local software development, and comprehensive service and support network.

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> *"The rollers can communicate with each other and can therefore respond flexibly whenever an unexpected condition arises."*

in the motor, such as those that indicate the distribution of the magnetic field strength. An electromagnetic field is generated when electric current flows through the three coils located within the outer ring of rotating permanent magnets.

Knowing how this magnetic field varies when the motor rotates provides the engineers with detailed information about the drive. The measurement data is used by the research team to compute the position of the rotor and to infer important information about the performance of the motor. "By analysing this data, we are able to control the motor in a very efficient manner," explained Nienhaus.

If one of the rollers is not rotating properly because the bearing is worn, or if a short circuit has knocked out one of the coils, the magnetic field generated by the motor will change and this will be immediately registered by the system.

"The data we gather enables us to detect even very small changes," said Nienhaus. The system is able to detect any deterioration in the performance of a roller early on. The engineers perform calculations and experiments to determine how the measurement data correlates with specific motor states. The results are stored in the system's 'brain' — a microcontroller that processes the data in real time.

The thousands of individual rollers in the roller conveyor system interact with one another via the network operating system that is integrated into each roller. The rollers can communicate with each other and can therefore respond flexibly whenever an unexpected condition arises. Unlike conveyor systems with a centralised external controller, each conveyor roller 'knows' by itself how to respond at any given time. This makes it possible to build roller conveyor systems that can do new things.

"By analysing angular momentum data, we can draw conclusions about the weight of a box currently being transported and decide whether or not another package could be added to the box," explained Nienhaus.

"We want to develop the transport system to a stage where it can move freely on the ground," he continued. He and his team are also working on ways to make the data even more reliable by computationally filtering out artefacts and interference effects.

In addition to Nienhaus' group at the Laboratory of Actuation Technology at Saarland University, other project partners are Professor Martina Lehser from Saarland University of Applied Sciences, Wellgo Gerätetechnik (Nohfelden), HighTec EDV-Systeme (Saarbrücken) and Micronas (Freiburg).

The Federal Ministry of Education and Research (BMBF) has funded the project 'Rolle' to the tune of €4.2 million, of which around €500,000 was allocated to Saarland University.

Drive systems specialist Matthias Nienhaus from Saarland University is collaborating with partners to develop smart conveyor rollers that communicate with one another. Image credit: Oliver Dietze.

INDUSTRY

FOOD PROCESSING

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Winery's custom forklift steps up to the marc

When boutique winery Ocean Eight decided to retire its 30-year-old 'relic' of a forklift, it was pleasantly surprised to discover its replacement could be custom-built to meet the winery's needs.

Mike Aylward, the general manager and winemaker, said Ocean Eight's forklift is used for general warehouse duties, but it takes on a demanding and critical role during harvesting at the Mornington Peninsula vineyard.

"The forklift is very much used in the processing side of our winery. Fruit is delivered in 500 kg bins, which the forklift lifts and then rotates into our grape press or grape destemmer. As we process around 90 tonnes of fruit a year, it is vital we have a reliable forklift doing this work.

"We only get one crack at it, and when the grapes are ready to be harvested they must come off straight away. There is no time to waste when making high-quality wine."

Where previously carrying out these two tasks meant a time-consuming process of attaching or detaching the bin tipper, the new Toyota 8FBN25 8-Series battery-electric forklift has been fitted with a custom-built attachment that delivers significant benefits in the busy harvesting season.

Toyota Material Handling Australia (TMHA) engineers created a quick-release mechanism for the bin tipper attachment, so the forklift retains its full range of features with the attachment on or off.

"This adaptability is a real plus when we are in the heat of harvest," Aylward said.

"It was previously a difficult process to swap between the bin tipper and normal forklift duties, and by being able to quickly remove the bin tipper they've increased the forklift's capacity from 1.3 to 2.3 tonnes, so they're very happy that they can now get the full range of uses they need from their forklift," TMHA Melbourne Area Sales Manager Grant Owen said.

Toyota Material Handling Australia Pty Ltd
www.toyotamaterialhandling.com.au

Portable compressor

Kaeser's Mobilair M 350 portable compressor comprises a Mercedes Benz engine and a Kaeser rotary screw compressor block with Sigma Profile rotors to provide compressed air delivery with minimal emissions and fuel consumption.

The viscous fan clutch controlled via Kaeser's Sigma Control Mobile can cut fuel consumption by up to 5%, according to the company. The control system matches power to actual compressed air demand, enhancing both compressed air availability and fuel efficiency.

Options include: availability with various pressures; a stationary version; and specialised equipment for use in refineries. Air treatment components can be added to provide cool, dry, technically oil-free air of various classes.

The portable compressor is available in four pressure stages between 8.6 bar (flow rate 34 m^3/min) and 14 bar (flow rate 24 m^3/min).

Kaeser Compressors Australia
www.kaeser.com

Wirelessly monitored storage tank safety valves

Emerson Process Management has introduced the Enardo 850/950 series of wirelessly monitored pressure vacuum relief valves (PVRVs) that provide safety and emissions control by managing the pressure in storage tanks.

A PVRV opens and closes in response to pressure fluctuations — caused by changes in temperature, liquid level or both — to ensure that safe pressure levels are maintained. However, because PVRVs are located on the top of storage tanks, they are difficult to monitor. The wireless solution enables immediate response to prevent problems related to safety, emissions and the quality of a tank's content.

Emerson Process Management Aust P/L
www.emersonprocess.com.au

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Melbourne (Head Office) I Sydney I Brisbane I Townsville I Perth I Adelaide

SEW EURODRIVE

Ergonomic rear-post bulk bag filler

Flexicon's Rear-Post Bulk Bag Filler features a fill head that pivots to the operator at floor level for safe, ergonomic spout connections and a low-profile loading deck that allows removal of filled bags using a pallet jack.

The cantilevered fill head pivots downward to place the inflatable bag spout seal, inflator button and four bag loop latches within an arm's length of an operator standing on the plant floor, eliminating the need to climb steps, strain or risk injury associated with overhead connections to conventional fill heads.

Once the operator connects the bag straps and activates the inflatable bag spout collar, the filler automatically pivots the fill head to horizontal, inflates the bag to remove creases and activates a flow control inlet valve or feed conveyor. As load cells register the gain in weight, the controller raises and vibrates the loading deck at programmed intervals to densify material and promote flow into bottom corners of the bag. Once the bag reaches its target weight, the controller automatically stops the flow of incoming material, deflates the bag spout collar and releases the bag straps, allowing the filled bag to be removed using a pallet jack or forklift.

A patented mechanism automatically resets the latch after releasing the bag loops and repositions it as the fill head pivots into a vertical position, enabling the latch to receive bag loops inserted by an operator and to re-latch automatically.

The filler is constructed of carbon steel with a durable industrial coating, with product contact surfaces of stainless steel finished to sanitary or industrial standards, and is offered with mechanical or pneumatic conveyors to source material from upstream process equipment or storage vessels.

Flexicon Corporation (Aust) Pty Ltd
www.flexicon.com.au

Compact integrated screw/slide system

Motion Technologies has available Haydon Kerk's WGS Wide Guide Screw linear slide.

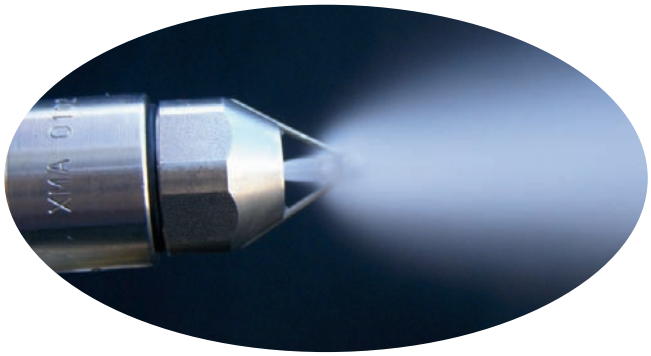
The linear slide utilises a screw-driven carriage that offers continuous linear speed, while maintaining accurate positioning. Length and speed of the WGS are not limited by critical screw speed, allowing high RPM, linear speed and long stroke lengths.

The slide has a compact profile that provides improved torsional stiffness and stability. An integral mounting base can provide support over the entire length, which can extend up to 2.4 m. Longer lengths are available as special orders.

Standard leads include: 2.54, 5.08, 12.7 and 25.4 mm travel/revolution and other imperial and metric leads are available. There are short leads for non-back driving vertical applications, eliminating the need for brakes, as well as longer leads capable of speeds of more than 1.5 m/s. The device utilises sliding plane bearings on a low-profile aluminium guide rail that keeps the motion smooth throughout the travel distance.

All moving surfaces include Kerkite high-performance polymers running on a Kerkote TFE coating. The slides come with wear-compensating, anti-backlash driven carriages. Additional driven or passive carriages can be added, along with application-specific customisation. Linear guides without the drive screw also are available.

Motion Technologies Pty Ltd
www.motiontech.com.au



Ultrasonic atomiser nozzles for dust suppression

For industries with moisture-sensitive dust particles or for compact locations, Tecpro Australia's Ultrasonic Atomiser Nozzles use a process in which tiny water jets are injected into a high-speed airflow before passing through a field of soundwaves. The soundwaves are produced by a resonator in the front of the nozzle which breaks the atomised spray into even smaller water droplets.

The size of the droplets can be controlled to match the size of the dust particles by controlling the air pressure. The droplets can be as small as 46 μm in diameter or up to 600 μm in diameter. The mist produced by the Ultrasonic Atomiser is so consistently fine that it evaporates quickly. This avoids the formation of mud and sludge in the vicinity. The nozzles are also drip-free due to their infinite turndown ratio.

The nozzles are easy to install and require little maintenance due to their self-cleaning properties and larger-than-usual nozzle orifice. Suitable for dust suppression in areas such as conveyor transfer points within industries including mining, cement, quarries and materials handling, they can be used in existing applications where air and water piping are already installed.

Tecpro Australia
www.tecpro.com.au

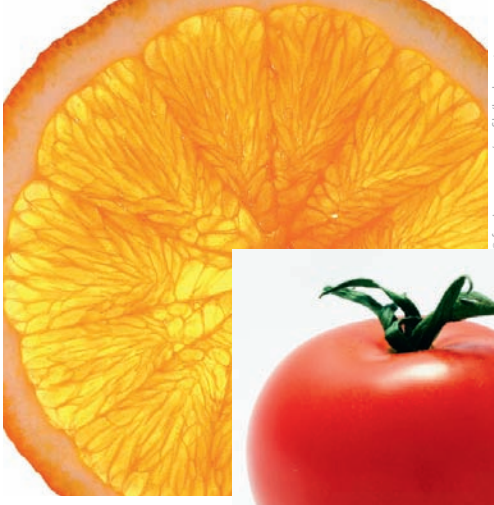
Refrigeration selection and calculation software updated

Danfoss has released an update of the Coolselector 2 software to include a selection and calculation tool that includes compressors and condensing units.

The software is suitable for major and minor refrigeration projects, from pump systems to dry expansion systems and large industrial pump plants. It delivers precise calculation, simple component selection, and intelligent support for industrial and commercial refrigeration and air conditioning throughout the entire process.

The software supports three main phases of system planning: calculation to support system design; selection of specific code numbers based on capacity information; automatic creation of required documentation and reports.

Danfoss (Australia)
www.danfoss.com.au



Riverina food industry to gain two rail hubs

Two regional rail hubs and business parks in NSW's Riverina district will be master planned and developed by Vaughan Constructions for joint venture partners Colin Rees Group and Amberly Management.

Ettamogah Rail Hub, 15 km north of Albury on the Hume Hwy, and Widgelli Rail Hub and Business Park, 10 km south-east of Griffith, will be strategically located to support over 500 km of rail branch lines throughout the Riverina.

Ettamogah Rail Hub, owned and operated by Colin Rees Group since 2009, will yield over 45,000 m² of warehouse space for lease. Cameron Jackson, chief operating officer for the Colin Rees Group, said, "We've concentrated on the rail operations but the time is right now, with the right partners, to offer more to our customers. The pre-lease interest has been encouraging with multiple enquiries on the hub already showing us that the demand is there in regional areas."

Widgelli Rail Hub and Business Park is situated on a 68 ha site owned by the Morshead family, a fourth-generation Griffith family with broad agricultural interests. Through their Amberley Group, the Morsheads have joined forces with the Colin Rees Group to develop the site, the first 30 ha stage of which will include a new rail hub, rail sidings and over 100,000 m² of warehouse space, hardstands and road networks.

An Australian Government Department of Agriculture report, released in April 2015, confirmed that in addition to grapes and tomatoes, the Riverina accounts for 96% of the total value of NSW's carrots, 74% of the state's oranges, 59% of the state's apples and nearly half of the state's rice production. "There's a huge variety of potential for users of the hubs, so Vaughan's design solution is flexible to accommodate any business," Jackson said.

"We know that production costs have been squeezed to breaking point, so the focus of many producers, processors, retailers and exporters is the supply chain. We saw a definite gap in the market. So we've teamed up with the Morsheads and Vaughan and we're able to offer 'short line' rail services in addition to conventional warehouse, cold storage and distribution facilities to our customers. Our Regional Connect network can get your box from anywhere in the Riverina to any eastern seaboard port and even Perth via the Junee or Cootamundra connections," said Jackson.

Rail transport in the US has been revived thanks to short line rail, which offers the advantages of economies of scale to individual customers, by pooling assets and infrastructure in hubs.

"The concept of bringing rail to the customer, similar to the US, is a winner. Our development partners are investing in quality assets with a long-term view of the success and viability of rail," said Andrew Noble, director and general manager of Vaughan Constructions. "It's also likely to reinvigorate or reopen disused rail links."

The total construction value of the two projects is $200m. Ettamogah is expected to be fully developed within 18 months and the first of two major stages at Widgelli over the next 2 years.

Vaughan Constructions Pty Ltd
www.vaughans.com.au

Lachenmeier Stretch Hood Pallet Wrapping

- Flexibility – multiple pallet sizes can be handled by a single machine
- Reduce dependence on extra packaging material – less straps, less corner posts, less costs.
- Protection – fully enclosed hood, waterproof, contaminant free.
- Clarity of stretch hood material allows instant barcode scanning of products on the pallet
- High throughput – fastest end of line packaging solution, bar none.
- Load is secured by vertical force, which drastically reduces the pressure on the packaged goods – Less damage in transit, less rejects from end user.

We have a dedicated test machine in Melbourne, where we test wrap your pallets, and you can see the benefits of stretch hood on your products. Contact us to find out more.

lachenmeier.com/food

Lachenmeier

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www.lachenmeier.com

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Tel. +61 3 9850 6666 ▪ sales@blissandreels.com.au
www.blissandreels.com.au

Dust-tight mobile drum tipper

Flexicon's TIP-TITE mobile drum tipper allows dust-free transfer of bulk materials from drums into process equipment and storage vessels.

Ready to plug in and run, it is mounted on a mobile frame with floor jacks for stable operation.

A hydraulic cylinder raises the drum carriage, which seals the drum rim against a discharge cone, after which a second hydraulic cylinder tips the carriage-hood assembly and drum, stopping at a predetermined dump angle of either 45, 60 or 90° with a motion-dampening feature.

As the assembly approaches its fully tipped position, the outlet of the discharge cone mates with a gasketed receiving-ring inlet fitted to existing process equipment or to the lid of an optional hopper with integral pneumatic, tubular cable or flexible screw conveyor, creating a dust-tight seal.

Once the discharge cone is seated against the gasket, a pneumatically actuated slide gate valve opens, allowing material to enter the receiving vessel.

The unit accommodates drums from 114 to 208 L, weighing up to 340 kg and measuring 91 to 122 cm in height. An optional pneumatically actuated vibrator on the discharge cone promotes complete evacuation of non-free-flowing materials.

The drum tipper is available constructed of mild steel with durable industrial finishes, with material contact surfaces of stainless steel or in all-stainless steel finished to food, dairy, pharmaceutical or industrial standards.

Flexicon Corporation (Aust) Pty Ltd
www.flexicon.com.au

3D vision sensors with snapshot technology

SICK 3vistor-T 3D vision sensors incorporate 3D snapshot technology to provide flexibility for indoor use.

The vision sensors provides real-time depth information for each pixel — including stationary applications — based on time-of-flight measurement. This involves transferring all 3D raw data — or application-specific information which has already been preprocessed — in a way which has been customised to suit the respective application. The sensor is suitable for applications including intralogistics, robotics and industrial vehicles.

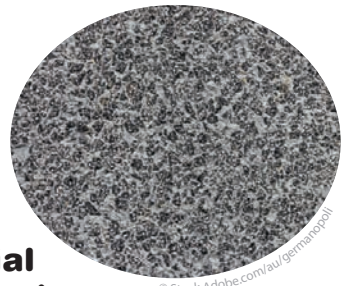
The sensors are available in two different product variants: a basic 3D camera providing high-quality 3D point clouds and a smart 3D camera providing both complete and reduced 3D data.

More than 25,000 distance and intensity values are provided in a single recording, meaning no operator is required. The sensor features a programmable interface that can be used to transmit data to external PCs for evaluation.

The sensor provides spatial and depth information in real time for each image. Depending on the variant, this process outputs a pure point cloud, appropriately reduced image data or image data. The time of flight of a light signal between the object and the target object is measured for each point of the image. As soon as the arrival time of the reflected light signal is known, the distance (the third dimension) between the object and the target object can be calculated.

This provides flexibility for using the vision sensor in applications such as a preconfigured variant for automated guided vehicles or as a powerful 3D camera for individualised programming.

SICK Pty Ltd
www.sick.com.au



Antimicrobial PU resin flooring

Flowcrete Australia's Flowfresh SR flooring combines HACCP International certification with Polygiene antimicrobial protection and an easy-to-clean gloss finish.

The flooring is a heavy-duty, chemical-resistant, antimicrobial, polyurethane resin floor system with a positively textured finish to provide slip resistance. The system is designed for wet processing zones such as food manufacturing, preparation areas, commercial kitchens and chemical processing plants.

The seamless and impervious finish that Flowfresh creates is easy to clean. The robust system retains its functionality in the face of typical food industry challenges, such as corrosive food by-products, thermal shock from hot ovens and steam cleaning, spillages and heavy impacts.

The antimicrobial additive Polygiene is able to eliminate up to 99.9% of bacteria that comes into contact with the floor. The polyurethane system meets the ISO 22196 standard, which measures the antibacterial effectiveness of plastics and other non-porous surfaces.

Flowcrete Australia
www.flowcrete.com

Single servo cable system with digital resolver

The Kollmorgen SFD3 (Smart Feedback Device; 3rd Generation) single servo cable system combines single-cable technology with robust resolver feedback.

The digital resolver technology can simultaneously transfer motor ID and temperature data and it requires two wires instead of the customary four wires for resolver feedback. One cable and feedback combination is suitable for all applications, both conventional and high-end. It is suitable for use with Kollmorgen's AKMH Stainless Steel IP69K Food Grade compliant servo motors. Due to the high interference resistance, data can be transferred safely within one cable.

Motion Technologies Pty Ltd
www.motiontech.com.au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Bulk NEWS

ACCC challenges egg cartel ruling

The Australian Competition and Consumer Commission (ACCC) is appealing a decision by the Federal Court on 10 February 2016, which dismissed the ACCC's proceedings against the Australian Egg Corporation Limited (AECL) and four other corporate and individual respondents alleging attempts to induce egg producers to enter into an arrangement or understanding to restrict or limit the production or supply of eggs.

The ACCC had alleged that AECL, Farm Pride Foods Ltd (Farm Pride) and Ironside Management Services (trading as Twelve Oaks Poultry) had attempted to induce egg producers who were members of AECL to cull hens or otherwise dispose of eggs for the purpose of reducing the number of eggs available for supply to consumers and businesses in Australia.


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The ACCC had also alleged that James Kellaway, the managing director of AECL, and Jeffrey Ironside, a director of AECL and Twelve Oaks Poultry, had attempted to induce egg producers to engage in cartel conduct. AECL is an industry corporation that collects levies from its members for promotional activities and research and development activities.

In dismissing the ACCC's application, the Court found that while the ACCC had established that the respondents intended that egg producers should take action to address and correct an oversupply of eggs, it did not establish that this action was intended to be pursuant to an agreement or understanding involving mutual or reciprocal obligations by competing producers.

"Detecting and deterring cartel conduct continues to be a major focus for the ACCC. It is important that we seek clarity from the Full Court on issues of what will and will not constitute attempted cartel conduct, particularly in the context of conduct by a trade association interacting with its members," said ACCC Chairman Rod Sims.


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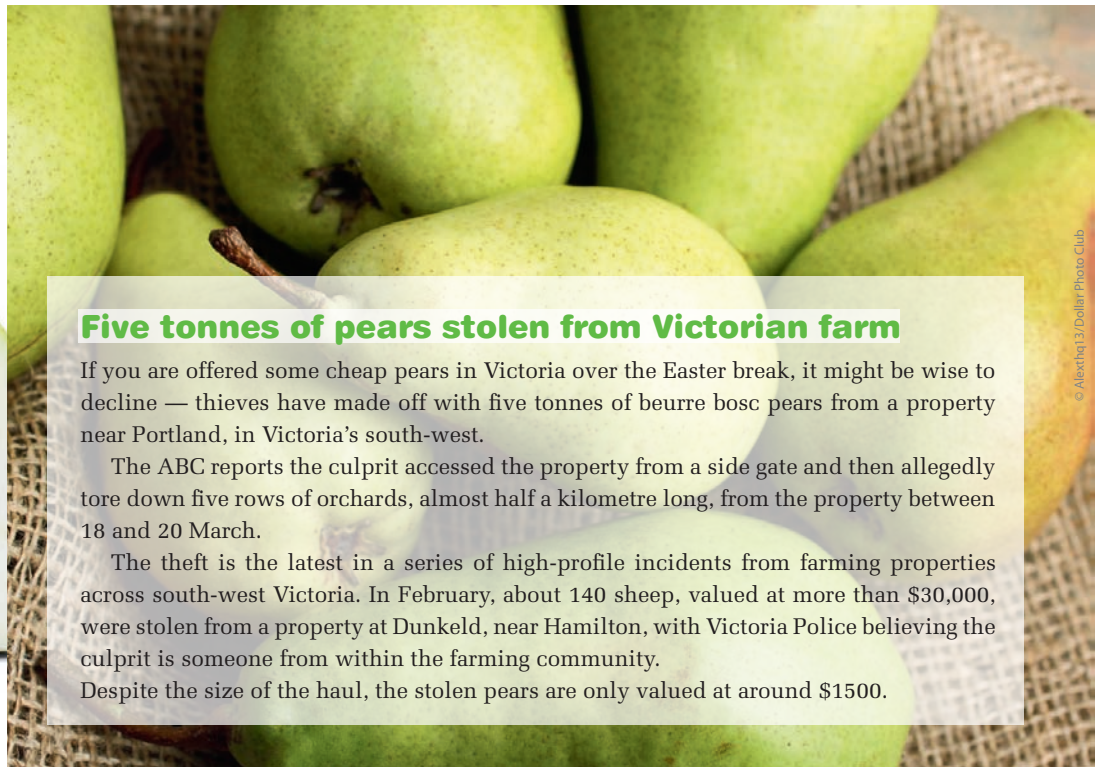
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Five tonnes of pears stolen from Victorian farm

If you are offered some cheap pears in Victoria over the Easter break, it might be wise to decline — thieves have made off with five tonnes of beurre bosc pears from a property near Portland, in Victoria's south-west.

The ABC reports the culprit accessed the property from a side gate and then allegedly tore down five rows of orchards, almost half a kilometre long, from the property between 18 and 20 March.

The theft is the latest in a series of high-profile incidents from farming properties across south-west Victoria. In February, about 140 sheep, valued at more than $30,000, were stolen from a property at Dunkeld, near Hamilton, with Victoria Police believing the culprit is someone from within the farming community.

Despite the size of the haul, the stolen pears are only valued at around $1500.

Seminar on the WELL Building Standard

Industry pundits forecast that the next trend in property will be wellness — the concept that the built environment can be a vehicle to support human health and wellbeing. Industry event ARBS 2016 has responded with a seminar panel discussion titled 'Is wellness the next green?'.

The WELL Building Standard, established in the United States by the International WELL Building Institute (IWBI), uses evidence-based medical and scientific research to support its certification program. More than 2 million m^2 of space has gained WELL certification in 12 countries and a number of Australian interests are now lining up to register WELL projects — including Lendlease, Macquarie Group, DEXUS and Frasers Property.

Will the WELL Standard be the next Green Star or NABERS? How can WELL ratings help building owners and managers measure the health and wellbeing of building occupants? And will it become a new market differentiator that separates the leaders from the laggards?

Led by Romilly Madew from Green Building Council of Australia, Tony Armstrong from the IWBI and Mark McKenna, NDY group leader, sustainability – Norman Disney & Young, and moderated by Tony Arnel, global director sustainability, Norman Disney & Young and president, Energy Efficiency Council, the seminar will provide a nuts-and-bolts explanation of the WELL Building Standard and its focus areas. The discussion will explore opportunities and obstacles to its take-up in Australia, as well as why healthy buildings are becoming the 'next big thing'. ARBS 2016 will be held from 17–19 May at the Melbourne Convention & Exhibition Centre.

Bulk NEWS

ACCC puts the spotlight on agricultural supply chains

The Australian Competition and Consumer Commission (ACCC) has announced an increased focus on agriculture, including investigations into supply chains, regional workshops and advocacy.

Speaking at the ABARES Outlook Conference in Canberra, ACCC Chairman Rod Sims said new agriculture commissioner Mick Keogh would be working closely with a dedicated Agriculture Enforcement and Engagement Unit.

"The unit will allow us to build our internal knowledge around the complexities of agriculture supply chains. This will inform the analysis, and ultimately the decision-making, of the ACCC," said Sims.

"The new unit will focus on investigating potential breaches of the Competition and Consumer Act and, where appropriate, taking enforcement action; increased engagement with the agriculture sector; and advocacy on agriculture issues, including through the use of market studies."

Sims said the ACCC intends to focus enforcement activities on agricultural supply chains to address anticompetitive conduct or unfair trading practices taking place that breach the Act. However, he cautioned that the commission's enforcement action was guided by the Act, and behaviour that some may perceive to be anticompetitive conduct or unfair trading may not be a breach of the law.

Sims said the ACCC is looking to increase engagement with farmers and other agriculture businesses to ensure they are aware of both their rights and obligations under the law.

"Our new Agriculture Unit will enable the ACCC to have a far greater presence in regional Australia… we will hold a series of workshops to speak with farmers and agribusinesses about how competition and fair trading issues affect them."

Sims said market studies would also form part of the ACCC's advocacy work in agriculture, enabling the ACCC to improve transparency about how a market operates, by examining particular agricultural supply chains and commercial processes.

The ACCC chairman said the organisation will continue work in regulating water and wheat ports, administering the Horticulture Code of Conduct, assessing mergers and strengthening the position of growers through collective bargaining.

Bulk NEWS

Port Kembla bulk wheat terminals exempted

The Australian Competition and Consumer Commission (ACCC) has exempted GrainCorp and Quattro's bulk Port Kembla wheat terminals from compliance with Parts 3 to 6 of the Port Terminal Access (Bulk Wheat) Code of Conduct.

The code regulates bulk wheat port terminal service providers to ensure that exporters have fair and transparent access to terminal facilities. Where appropriate, the ACCC may reduce regulation at a specific port terminal by exempting the relevant port terminal service provider from certain provisions of the code.

A position paper issued by the ACCC in October 2015 indicated its intention to exempt the facilities once Quattro's facility became capable of handling bulk wheat.

"The ACCC's assessment was that there will likely be a significant amount of spare capacity across GrainCorp and Quattro's facilities at Port Kembla. This will mean that both parties will have strong commercial incentives to compete to attract customers to use their services," ACCC Commissioner Cristina Cifuentes said.

In March 2016, Quattro advised the ACCC that it was planning to load its first bulk wheat export vessel by the end of the month.

"The level of competition between GrainCorp and Quattro for bulk export customers at Port Kembla makes these exemptions appropriate."

The ACCC intends to monitor the level of competition at Port Kembla in the future. Both GrainCorp and Quattro are still required to provide information on their shipping activities at Port Kembla under Part 2 of the code, which will allow the ACCC to monitor issues such as export volumes and market concentration.

Rockwell Automation to acquire intelligent conveying systems manufacturer

Rockwell Automation has announced it has agreed to purchase MagneMotion, a manufacturer of intelligent conveying systems used across a broad range of industrial applications, including packaging and material handling.

"MagneMotion expands our existing capabilities in independent cart technology. Our recent acquisition of Jacobs Automation and its iTRAK technology is complementary to MagneMotion's portfolio. We see a future where the transportation of products within the factory, whether inside of a particular machine or between machines, will be fully controlled to optimise the productivity and flexibility of the entire process," said Marco Wishart, vice president and general manager of Rockwell Automation's motion control business.

MagneMotion will be integrated into Rockwell Automation's motion business, within its Architecture & Software segment.

Bulk NEWS

Dematic acquires Australian AGV manufacturer NDC Automation

Dematic has announced the acquisition of NDC Automation, a provider of automated guided vehicles (AGVs) and software in Australia and New Zealand. NDC Automation will operate under the trade name NDC Automation for a transition period locally, and globally as Dematic.

Ulf Henriksson, Dematic president and CEO said the acquisition of NDC Automation would enhance the company's ability to design, deliver and deploy global AGV solutions that move, store and/or retrieve goods.

"The NDC portfolio expands upon an existing portfolio that will dynamically optimise the movement of raw materials or finished goods as they move throughout a facility, including software that provides real-time information addressing material flow metrics," said Henriksson.

Headquartered in Australia, NDC Automation has been providing AGV solutions for companies located in Australia and New Zealand for more than 40 years, pioneering advances in the areas of safety and vehicle navigation for its customers.

Sorting and conveying technology

BEUMER has available a range of sorting and conveying technology to enable efficient material flows.

The E-Tray Sorter has a contactless energy supply and is available with motor-driven tilt units in sizes BS 25 and BS 55. With the integrated diverter function, the tilt unit enables individually packaged goods to be discharged in two dimensions on both sides of the sorter. Since the tilting movement is independent of the sorter speed, the equipment runs faster than comparable sorters, according to the company.

The Belt Tray Sorter can be fitted with a variety of modules and functions, depending on the application. With a contactless energy supply and a linear motor drive, it sorts goods and conveys them to the correct destination, regardless of size, shape or the kind of surface. The modular design makes it possible to adapt the equipment to the conditions of a particular building.

The Crisplant LS-4000 is a high-speed loop sorter used in postal and distribution centers. The cross-belt and tilt-tray sorters mean that the goods are handled quickly but carefully.

The semi-automatic Parcel Picker bulk unloading machine relieves workers of heavy physical work, while increasing productivity. The machine enables staff at postal and CEP companies to unload packages of varying sizes and weights, parcels and shipping units from swap bodies and full trailers, with throughputs of more than 2500 packages per hour possible.

BEUMER Group Australia Pty Ltd

www.beumer.com

what's new in

food

technology & manufacturing

meat poultry seafood

The IoT and the red meat supply chain

Countries, companies and consumers are demanding accurate information and precise identification of the products they purchase and many countries are implementing legal requirements for traceability. Internal and external visibility from the animal in the field, through the processor and distributor to the meat pie in the supermarket, is now becoming expected.

The path from the field to the fork is often long and tortuous but technologies, techniques and standards now exist to enable robust whole-chain traceability in the red meat industry.

The biggest enabler of this extensive traceability is the Internet of Things (IoT). Research firm Gartner estimates that the IoT will consist of 26 billion sensors, instruments and connected devices by 2020 (and this staggering number does not include smartphones, PCs and tablets). In another measure, International Data Corp estimates the annual revenue from IoT solutions will be around US$7.1 trillion in 2020.

Ultimately, nearly every business will be supported by machine intelligence transmitted through the IoT. However, for this to actually work the businesses will have to rely on accurate, fresh, timely operational data. And where will this data come from? It will be up to the foot soldiers of the IoT, the sensors embedded into the operations, to collect and communicate the data. Interoperability will be essential so that the data from one part of a supply chain in one company can be comprehensible to the rest of the users of the data.

GS1 New Zealand General Manager, Sector Development Gary Hartley has long recognised the potential in the IoT to transform the livestock industry and has conducted several trials that have demonstrated the IoT's viability for this task.

In 2012, Hartley and a network of deer farmers and processors, a shipping company and a distributor successfully demonstrated how a cut of venison sold in a Hamburg butcher shop could be traced back to a particular deer on a New Zealand farm. Radiofrequency identification (RFID) technology and the IoT were used for the tracking.

It wasn't all plain sailing as all of the players had to agree on a consistent, standards-based methodology for classification of the meat cuts. This was achieved using a network of parent/child RFID codes.

Hartley completed another demonstration of global traceability in the meat industry in 2014 when GS1 and ANZCO Foods trialled the use of RFID technology on a shipment of Halal-certified meat products to Kuala Lumpur.

In response to Muslim consumers becoming concerned about the authenticity of Halal claims on meats, the Malaysian Gov-


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ernment has established an economy-wide repository on Halal products. The Halal Industry Development Corporation (HDC) has used industry-standard GS1 data formats and technology for the synchronisation of data between trading partners. This 'data pool' will enable supply chain transparency and traceability and the systematic authentication of both local and imported Halal products. (Food producers, processors and distributors will need to be registered with the HDC and to submit their product data).

In the ANZCO/GS1 trial, RFID technology was used on a shipment of Halal meat products to Kuala Lumpur. The products were certified at processing and then tracked and traced using EPC/RFID tags, readers and databases between processing in NZ at ANZCO's Kokiri plant and delivery to the Kuala Lumpur cold store.

The use of EPCglobal/GS1 Standards facilitated the interoperability and communication between the participating bodies.

EPCglobal Network

A GS1 initiative, the EPCglobal Network is a suite of internet services for sharing product data around the world. The open standards-based system will make organisations more effective through real and timely visibility of information about items in the supply chain.

The global standard combines low-cost RFID technology, existing communications network infrastructure and the Electronic Product Code (EPC) (a number for uniquely identifying an item) to create cost-efficient, real-time, accurate information about the location of items, the history of items and the number of items in the supply chain.

In contrast to a barcode, which only contains the identity of the product and its manufacturer, the EPC enables the inclusion of serial numbers that identify the item right down to the 'instance' level; for example, a case of rump steak can be identified separate from all other cases of the same product.

EPC numbers are not only used to identify items, they can be used to identify locations as well. In a meat processing plant, an EPC number can be used to uniquely identify specific locations on the site (say a boning room or an export dock door).

For tags and readers to be EPC compliant, the equipment needs to comply with a number of EPC-related protocols and standards. A key hardware standard requirement for all EPC tags and readers is interoperability.

The EPCglobal Network encompasses both the EPC identification numbering schemes and a special network component named the EPC IS, or Electronic Product Code Information Service. The EPC IS is the database component of the EPCglobal Network, which stores individual item data and event reads. It enables network users to exchange EPC-related data and thereby manage the movement, storage and presentation of the dynamic information required for traceability. EPC IS can be used in any industry, anywhere in the world. It can be used to link entities, objects, places and occurrences of all kinds in a dynamic manner; ie, the IoT.

No system is better than its components

RFID and barcodes, along with supply chain collaboration, can provide timely, actionable data related to the movement of the product through the supply chain and traceability for regulatory compliance.

Data collection by barcode and RFID is particularly accurate — often greater than 99%.

However, the system is dependent on accurate product identification. If the printers, label materials, scanners and sensors are not adequate for the task and suitable for use through the rigours and extremes of the movement of the product, the data gathered will be compromised or invalidated — and ultimately, useless.

The red meat industry is harsh — equipment such as sensors and scanners and consumables like labels must be robust enough to withstand cold-room, freezer and washdown conditions. Time taken to ensure this equipment is fit for these extremes will be well spent, and the benefits will be calculable.

By utilising the information, gathered at different RFID read points in the supply chain, companies will be able to track and trace goods and product information. They will even be able to record conditions such as temperatures etc as product passes along the supply chain. In the event of a recall, the affected products will be identifiable and locatable.

Economic benefits will follow as companies use the real-time, accurate information to manage their supply chains more effectively, respond quickly to market needs and meet safety and regulatory requirements from international export markets.

SICK Pty Ltd
www.sick.com.au

Pig farm successfully eradicates antibiotic-resistant bacteria

A German pig farm found to be contaminated with antibiotic-resistant bacteria has been successfully decontaminated.

A study in the journal *Applied and Environmental Microbiology* reports that routine monitoring had detected both methicillin-resistant *Staphylococcus aureus* (MRSA) and antibiotic-resistant, pathogenic intestinal bacteria, the Enterobacteriaceae, on a pig farm. The Enterobacteriaceae were expressing resistance genes called extended-spectrum βlactamases (ESBL-E). βlactamases disable a broad, very important class of antibiotics called βlactams, which inhibit bacterial wall synthesis.

The farmer approached the investigators for help and a study was designed to examine whether intensive decontamination performed by a commercially available service would effectively expunge the pathogens contaminating the farm environment.

Samples were collected at different time points both before and after decontamination, from the pigs, the air, water and manure, and from the farm personnel.

"Later, we compared the time points and the different media to evaluate the efficacy and durability of the decontamination measures on the farm," said corresponding author Isabelle Bekeredjian-Ding, MD, MPH, Head of Microbiology, Paul-Ehrlich-Institut, the German Federal regulatory agency for Vaccines and Biomedicines. Following decontamination, the investigators could no longer detect the MRSA and ESBL-E strains of bacteria in the farm environment, in the farm personnel or on the new pigs that repopulated the stables, said Bekeredjian-Ding.

"However, we found a new MRSA strain that we had never detected previously," said Bekeredjian-Ding. "This strain colonised the pigs and contaminated the environment just two days after the arrival of new pigs." The investigators also found the new strain colonising the noses of farmworkers. They conclude, therefore, that the major challenge to farm hygiene may be in preventing reintroduction of a new or old resistant strain from an external source.

A year after decontamination, the farmer reported that the farm had been able to greatly reduce use of antibiotics, that incidence of diarrhoea among the animals had dropped to zero and that the mortality rate among piglets had fallen below 2%. Thus, despite its high cost, decontamination had resulted in significant benefits to the farm, said co-author Brigitte Petersen, Professor and Head of Preventive Health Management at the Agricultural Faculty, the University of Bonn.

Decontaminating the pig farm involved high-pressure cleaning and then drying the stables, followed by treatment with a complex solution containing amphoteric surfactants and complexing agents. That was followed by a two-day–long disinfection process using a complex formula that comprised formaldehyde and dimethyl ammonium chloride, as well as other compounds. Finally, the manure pit, ventilation system and feeding installation were nebulised for 48 hours at 1000°C. The process also included constructing new stables, from metal and plastic, which are more easily disinfected than wooden structures.

"Our results show that the control of MRSA colonisation can be achieved with basic but rather aggressive infection control measures," the investigators concluded.

Spray chilling nozzles for meat processing

Spray chilling is the intermittent spraying of carcasses with water during the early stages of the cooling of the hot sides. Its primary purpose is to reduce the weight loss in the carcass during the first 24 hours. Beef carcasses are normally chilled for 16 to 20 h prior to boning into primal cuts and trimmings, which are packed for further cooling and dispatch. During this carcass chilling process, carcasses can lose 1–2% of their hot weight, which is a potential loss of revenue for the processor.

Spray Nozzle Engineering has developed a range of carcass chilling nozzles to suit existing or new systems. Bolted or clamped versions are available with a choice of nozzle requirements, and full cone, hollow cone and flat spray options. Nozzle types are dependent on the application, whether static or mobile. As part of Spray Nozzle Engineering's range of water-/chemical-saving solutions, there are also foamers and sanitisers. Lafferty's chemically resistant poly mixing chambers with flow-metering technology ensure correct chemical mixing ratios.

Spray Nozzle Engineering

www.sprayingsolutions.com.au

The perfect steak should only take about a century...

That's about two generations a side.

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Excellence reimagined

Automation and meat processing

With quality and hygiene the top priorities in the meat processing industry, manufacturers are turning to state-of-the-art sensors that not only control production, but also record inline the quality of raw goods and manufacture.

When it comes to sausages, the German city of Böklund has been leading the way for more than half a century. At the end of the 1930s, Böklunder was the first company in Germany to introduce automated production. Since then the company has prevailed not only as the inventor of sausages in a jar, but is also one of the pioneers in introducing automation to the meat processing industry.

Meat is not only a hygienically sensitive product. It is above all a product whose anatomical features set limits to far-reaching automation. Solutions are being investigated which deviate from the standards of other branches and open up economic prospects to processing operations. The best example of this is the work from EDEKA Southwest in Rheinstetten, Germany, one of the most modern meat businesses in Europe.

Here, 20 production lines allow for the smooth processing of 4000 sides of pork and 1000 beef quarters daily round the clock. In order for a factory of this order of magnitude to work efficiently, all processes must be IT-supported - from the receipt of goods to the dismantling and production to the packaging and shipping.

Exact pictures for dismantling

Early analysis of meat quality is of central significance for the automated dismantling process in Rheinstetten. A special hardware and software solution, the 'Image-Meater' from CSB, fully classifies the sides of pork automatically. Cameras record the carcasses and sort them into different quality levels with the help of the measurement results. In this way the software determines the exact trade value of all parts such as ham, shoulder, pork belly and cutlets - contact-free and perfectly hygienically.

Wireless data for more hygiene

It goes without saying that the transmitter and the measurement amplifier must meet high standards. But high requirements are also placed on the measuring cable. In hygienically sensitive areas such as meat processing plants, avoiding the introduction of cables can be very attractive. A whole line of wireless solutions that obviate the need for the laying of cables has emerged. Cable-free devices are being used to record all sorts of information. For example, the Wtrans-T resistance thermometer with radio measurement transmission from Jumo can be used to continually measure, record and transmit the temperatures in cooking and smoking chambers as well as the core temperature of the product.

Indirect insight into production

It is not only temperature and pressure that can be measured inline, criteria that once required chemical analysis can also be measured. The parameters are not directly measured, but indirectly - with a physical quantity which correlates to the desired value. The inline measurement of fat content is a stage of expansion for automation. It plays an important role in the standardisation of the fat content in the final product. In his plant, Seydelmann conveys this 'indirect insight' into production with high-resolution near-infrared spectroscopies (NIR) and X-ray technology. The real-time results of the NIR method achieve a precision on par with laboratory analyses.

In this process, the surface of the ground meat is scanned during transport and the fat content is continually displayed on the service terminal. This means that out-of-spec product can be identified in real time so immediate changes can be implemented while production is in progress.

X-ray technology enables an even more exact analysis. The fat content can be checked for deviations up to a certain percentage and allocated according to weight. Simultaneously, product safety increases, because contaminants such as bones, glass and metal can be reliably identified and removed.

The trend towards automation continues

Automated lines are still rarer in the meat industry compared to other food areas. But the trend towards automation in meat and sausage production has advanced, especially in areas such as packaging.

Where once individual machines ruled, now the processing of meat, ham and sausage is occurring more and more frequently on fully automated lines which not only maximise efficiency and profit - they also ensure higher quality and safer products.

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Meat processor quadruples throughput with labelling technology

Since its inception in the mid-1860s, Australian company Greenham & Sons has grown from a sole trader family business to a multimillion-dollar meat processing business.

When company growth meant that the company's processing speed far outweighed its ability to label products, in 2015 Greenham approached Result Group for advice on upgrading its labelling system.

Result Group recommended the HERMA multipurpose Meat Tray Label and Sleeve Applicator.

"The move from hand to automatic label application has effectively quadrupled our throughput of beef products. Previously our production limitation was the label application step, but now because of the automatic HERMA label applicator we are more than keeping up with the speed of product processing," Greenham Production Manager Michael White said.

A key benefit to Greenham of the HERMA Applicator is its versatility; a number of different product sizes and meat shapes can be put through the single labelling machine.

The equipment also weighs every item so the labels not only include the exact weight of each individual pack, they can include the retail price based on the preset price per kilo. For Greenham, this results in products that are shelf-ready before they've even left the plant. Details are automatically extracted from Greenham's ERP system to streamline data transfers for the production team.

The electronic weight functionality also results in the automatic rejection of packs that don't meet specifications. If a pack is under- or overweight it is not put through. This removes the need for the meat to be weighed by hand while processing and therefore creates efficiencies, speeding up the entire processing stage.

The HERMA multipurpose Meat Tray Label and Sleeve Applicator prints both barcodes and QR codes on the labels for Greenham. And it is also able to top and bottom label products in one pass with accuracy — suitable for traceability and multilingual labelling for export markets.

Result Packaging Pty Ltd
www.resultpackaging.com.au

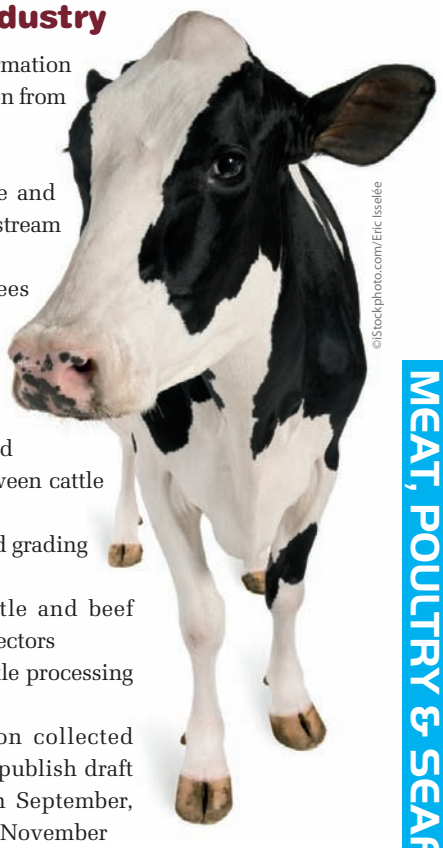
Single sausage link cutter

The Kyoei KKS-605T sausage link cutter features speed, precision and efficiency in a compact design. Using the latest technology available in the market, the cutter provides a precise solution that is easy and time-saving.

Manufactured in Japan, the single sausage link cutter is capable of cutting sausages with diameters of 12–35 mm and can be customised to meet specific requirements, including an optional slitting device. The sausage cutter is suitable for all type of castings, such as natural, cellulose and collagen. Product applications include: hot dogs, frankfurters, bologna, vienna, wieners, kabana, saveloys and many more.

Barnco Sales Pty Ltd
www.barncosales.com.au

ACCC looks into the cattle and beef industry



Competition, efficiency, transparency and trading issues in the beef and cattle supply chain are to be looked at in a market study just announced by the Australian Competition and Consumer Commission (ACCC).

The combination of issues raised through the 2015 Senate Inquiry into the effect of market consolidation on the red meat processing sector and the ACCC's own work led the ACCC to undertake this market study. With $11.4 million in funding over four years, the ACCC is establishing an Agriculture Enforcement and Engagement Unit that will conduct investigations and engagement in rural and regional areas.

The ACCC is seeking information through written and oral submissions and will hold public forums in regional areas across the country to hear directly from interested parties. The ACCC will also be accepting confidential submissions.

"We understand that some market participants may fear retribution from commercial partners for speaking to the ACCC. Equally, firms may be reluctant to provide the data we need to understand the complete picture," ACCC Commissioner Mick Keogh said.

"Therefore, we have established a strong confidentiality regime to assure interested parties that we will treat any confidential information sensitively. We will also accept information from anonymous sources," Keogh said.

The study will examine:

- competition between buyers of cattle and suppliers of processed meat to downstream customers
- the implications of saleyard attendees bidding on behalf of multiple buyers
- impediments to greater efficiency, such as bottlenecks or market power at certain points along the supply chain
- differences in bargaining strength and the allocation of commercial risk between cattle producers and buyers
- the transparency of carcase pricing and grading methods
- the share of profits among the cattle and beef production, processing and retailing sectors
- barriers to entry and expansion in cattle processing markets.

The ACCC will analyse information collected from submissions and forums and will publish draft findings for further comment, likely in September, followed by a final report, likely in late November

The Issues Paper and further information on the market study are available are at: www.accc.gov.au/agriculture.

Wiley to expand and upgrade

leading Australian red meat processor

Getting set to serve the world, Casino-based livestock processing company Northern Co-operative Meat Company Ltd (NCMC) is gearing up for long-term growth. The upgrade and expansion investment will enable its many operators to meet increased national and international demand for premium Australian meat. Brisbane-based international food facilities designer Wiley has been trusted to deliver on the 4-stage project set to run over 2016.

The projects consist of design and construction of a new state-of-the-art cold chain management facility; design and construction of a beef knocking box and race system; design, supply and install of a steam repair and relocation; and finally the tannery wastewater treatment plant upgrade.

NCMC Chief Executive Officer Simon Stahl said: "We have more than 100 operators who use our facilities in Casino to process their livestock. Our main focus is to provide them with efficient facilities using a highly trained workforce and specialised equipment to service all major global markets including Australia, the USA, China, Japan, Korea, European Union, Halal and organic markets.

"We chose Wiley to undertake the design and construction of our latest projects because we are confident in their specialist knowledge of the demanding standards of food safety and hygiene, especially in meat and across the cold chain production line.

"The knocking box and race system are a pivotal part of our abattoir and will set the rhythm for the rest of the facility. Wiley have experience in designing to international standards of animal welfare and this design complied with design principles created by US animal welfare expert Dr Temple Grandin.

"We look forward to our continued work with Wiley, which began earlier this year."

Wiley Managing Director Tom Wiley said: "NCMC has been around for nearly as long as we have and are well known as an industry leader in red meat processing. "Our team has worked closely with NCMC over the last few years to understand the requirements of each project and their desire to continue providing quality services and products to its customers servicing Australia and the world. They have strong values which align with ours, which further strengthens our long-standing relationship with them."

Wiley Senior Project Manager Barry Murphy said: "Our multidisciplinary team has drawn upon nearly a century of food industry experience to design and deliver highly innovative and best practice solutions in line with NCMC's budget and timeframes. For their new cold chain management facility, NCMC wanted to freeze and chill all beef and veal cartons on-site, reduce the transportation of products off-site, and improve staff and product flows throughout the facility.

"The design we came up with improves carton management, increases storage capacity on-site and improves load-out capabilities, ultimately reducing manual handling, forklift movements, and creating a safer environment for all workers.

"We'll also be installing an ASRS automated sortation and retrieval system, which is the first of its kind used in a frozen environment in Australia and only the second in the world. This system provides NCMC with the ability to better manage product flow and traceability.

"We're pleased that the building footprint and the equipment we have selected will allow NCMC to expand and modify their operations in the future.

"Meanwhile, our works on the tannery infrastructure will improve the segregation of the water waste streams.

"We look forward to working with NCMC on all four projects, taking approximately one year to complete."

what's new in Food technology & manufacturing

packaging

coding & logistics

Boiled egg 'on the go'

UK design company RPC has developed a packaging solution to cook boiled eggs wherever you are, simply by adding boiling water.

The Yowk pack includes a pre-boiled egg, bread sticks, a spoon and seasoning. Consumers remove the lid and contents, leaving the egg, and fill the container with boiling water. After five minutes, the egg is ready to eat. The lid doubles as an egg cup, while the spoon incorporates a small sharp 'tooth' to remove the top of the egg.

The design was a finalist at the World Food Innovation Awards in the Best Convenience/'On-the-Go' Packaging category.

Packaging NEWS

All health and nutrition claims must now meet the new standard

© iStockphoto.com/Elena Schweitzer

For the three years preceding 18 January, food companies could quite legally comply with either the old nutrition and health claims standard or the new one. But the transition period is now over and now companies must comply with the new standard.

Food Standards Australia New Zealand (FSANZ) has published a guidance document, which has been prepared by food regulators and is on the FSANZ website, which will help businesses decide whether or not they can make nutrition or health claims.

The following links may be useful in helping companies ensure that they understand and meet the new regulations.

- Getting your claims right (guidance for food businesses)
- Nutrition, health and related claims standard
- Enforcement agencies

AIP announces second Certified Packaging Professional recipient

The Australian Institute of Packaging (AIP) has announced the second recipient of the Certified Packaging Professional (CPP) designation in Australasia is Nina Cleeve-Edwards Dip.Pkg.Tech. MAIP, Manager – Oceania Innovation Acceleration Team, Nestlé Australia Ltd.

The CPP credential is the packaging industry's leading internationally recognised professional designation.

Awards recognise packaging's role in reducing food waste

Innovative and sustainable packaging that minimises food waste will be recognised by a new awards program launched by the Australian Institute of Packaging (AIP).

The Save Food Packaging Awards will recognise packaging designs from Australia and New Zealand that reduce food losses, extend shelf life and improve the supply of food.

Entries will be considered in the following three categories:

1. Agriculture — Industrial
2. Food Services
3. Retail (primary packaging)

The winners of each category will automatically be submitted into the international World Packaging Organisation Save Food Packaging Awards.

According to award chairman Pierre Pienaar FAIP, CPP, "A key component of the Save Food Packaging Awards is to raise the profile of the critical role of packaging to reduce food waste and therefore reduce products' overall environmental impact. It is time that packaging technologists are designing packaging to save food."

Pienaar said that up to 50% of the edible food produced does not reach the fork, and while the primary function of packaging is to protect the content, the function of packaging to reduce food waste is rarely discussed.

"Avoiding and preventing food loss and waste can considerably limit the scope of additional resource requirements, because approximately 30% of the food that is currently lost and wasted would already be sufficient to feed the starving world population," he said.

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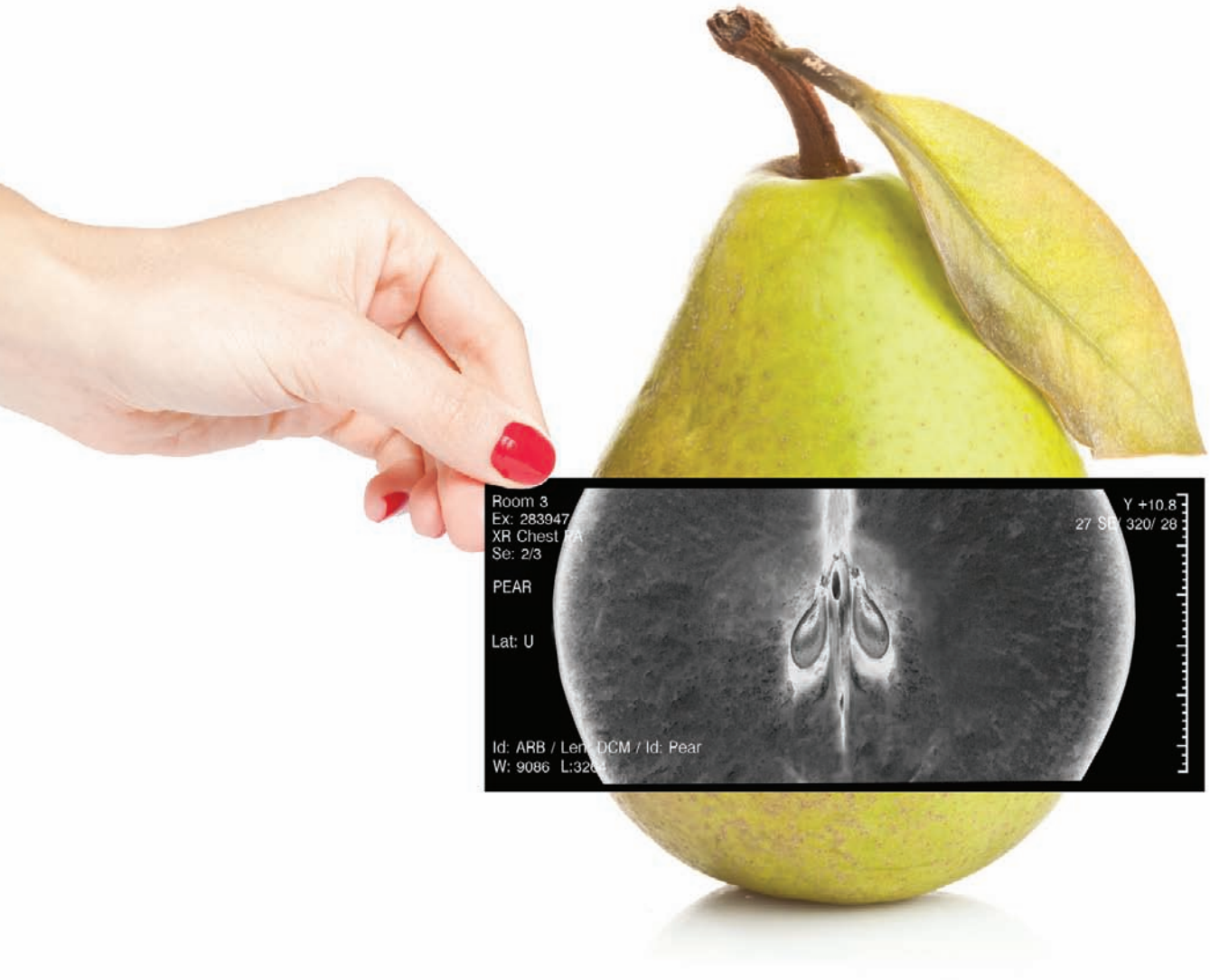

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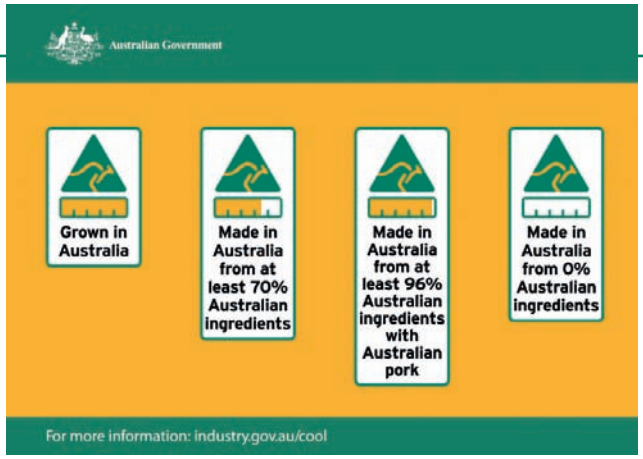
Country of origin labelling gets the go-ahead



The states and territories have given the green light to the federal government's reforms to country of origin food labelling, giving Australian consumers clearer and more meaningful information about the products they buy.

The Deputy Prime Minister and the Minister for Agriculture and Water Resources, Barnaby Joyce, and the Minister for Industry, Innovation and Science, Christopher Pyne, congratulated their state and territory colleagues for passing the reforms.

"This is an issue that has vexed governments on both sides for many years and today is a major breakthrough Australians have long been waiting for," Pyne said.

"The new food labelling system will provide Australian consumers with the clarity they deserve, without imposing an overly onerous burden on businesses."

Many foods found on Australian retail shelves will be required to include a kangaroo in a triangle logo to indicate the food is made, produced or grown in Australia. The new system will also include a bar chart, indicating the proportion of Australian ingredients.

"Australian consumers should be able to trust that claims such as 'Made in' and 'Product of' are applied consistently — and the new system will ensure that's the case," Joyce said.

"Australians want to know whether the product is from our nation or another, and if a mix of the two, what proportion is from our nation."

Vegetable industry body AUSVEG welcomed the agreement, with CEO Richard Mulcahy describing it as "an encouraging step forward".

"After many years of campaigning for effective reforms that eliminate ambiguous and deceptive labelling terminology, AUSVEG is pleased that the state departments have maximised the opportunity to come together and support the federal government's proposed reforms.

"Market research has shown that Australian consumers are desperate for a clearer indication of where the food they are buying comes from, as confusing statements such as 'Made from local and imported ingredients' left them none the wiser about a product's real origin," said Mulcahy.

"Although the proposed system does not offer a complete solution to these issues, AUSVEG recognises that it is an encouraging step forward to provide consumers with more transparent, informative labelling on the foods they buy."

With the introduction of the reforms, the enhanced country of origin labelling requirements will move from the Australia New Zealand Food Standards Code to Australian Consumer Law.

Minister for Small Business and Assistant Treasurer Kelly O'Dwyer said the government has provided the ACCC with additional funding of $4.2 million over five years to undertake compliance and enforcement activities in relation to the new requirements. The reforms will be introduced from 1 July with labels expected to appear in retail outlets later this year.

Packaging NEWS

ProPak Asia 2016 to feature Australian Pavilion

Australia's packaging and processing industry is set to receive a boost, with an Australian Pavilion to be featured at the ProPak Asia 2016 exhibition.

ProPak Asia is an international processing and packaging trade event for Asia's expanding food, drink and pharmaceutical industries, which will be held 15–18 June in Bangkok, Thailand.

The Australian Pavilion has been launched by the Australian Packaging and Processing Machinery Association (APPMA), which identified a need to help Australian manufacturers and distributors to showcase their products and companies to the Asian market in an affordable way.

Confirmed pavilion participants include: HMPS, Adaptapack, Rhima, Confoil, Accupack, the APPMA and the Australian Institute of Packaging (AIP). Outside of the pavilion other APPMA member companies such as tna, Heat and Control and Fibre King will also be exhibiting at the show. Many of the Australian participants will take the opportunity to launch new products at the exhibition.

Engineering solution provider AccuPak will launch the PLAGe, an entry-level evolution of its PLAG sugar linear weigher.

Confoil will be showcasing its range of Dualpak paperboard trays, pulp trays, as well as accompanying sealing machinery.

HMPS will launch the collaborative assembly robot YuMi. YuMi is a collaborative, dual-arm, small parts assembly robot solution that includes flexible hands, parts feeding systems, camera-based part location and state-of-the-art robot control. Equipment washing systems specialist Rhima Australia will launch its Revolutionary Tray Washers for bakeries at the event.

APPMA and AIP will also highlight their services at the exhibition, with APPMA launching its 2016 Member Directory and AIP announcing its Education & Training Courses for the Asian Region.

ProPak Asia 2016 has six dedicated zones: DrinkTechAsia, FoodTechAsia, Lab&TestAsia, PackagingMaterialsAsia, PharmaTechAsia and PrintTechAsia, to highlight growing demand from these sectors.

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Ishida gentle handling keeps frozen fish intact

Fandicosta is one of Europe's largest integrated seafood products companies, catching and processing 26,000 tonnes per year of species ranging from squid and swordfish to tuna and cod.

Among Fandicosta's range are 600 and 400 g bags of frozen hake fillets; each bag containing large (approximately 100 g) pieces that are well formed. "We try to avoid any very small pieces or fragments," commented Ramón Hermida Gómez of Fandicosta, "and that means we must avoid breakages during packing."

Formerly this gentle handling was achieved by using semiautomatic linear weighers, each feeding 14 operatives who manually placed the pieces in the bags. "The care taken by these people produced a high degree of product integrity," said Ramón. "However, as you can imagine it was slow, partly because each bag had to be weighed again using a static balance. Going all out, such a line could only produce 20 bags per minute."

To improve productivity, Fandicosta has begun introducing multihead weighing across its operation, with gentle handling weigher features from Ishida mounted over modern bagmakers. The weighers have wide, shallowly angled radial feeders and relatively short drop distances, to reduce impact and keep the fillets intact.

"We are keeping our breakages down to the same levels that we obtained using the manpower-intensive approach," confirmed Ramón.

The Ishida weighers have achieved speeds of up to 35 ppm, freeing up skilled labour to work in other parts of the plant. "Accuracy has also greatly improved," said Ramón Hermida, "which means we get a better yield of bags per tonne of fish."

Heat and Control Pty Ltd
www.heatandcontrol.com

Pre-made spouted pouch for aseptically processed products

Scholle has launched the CleanPouch Aseptic System — a pre-made, sterilised spouted pouch system for aseptically processed products.

The system includes an innovative spout, plug and cap combination, pouches made within cleanroom environments and a small-footprint, high-output aseptic rotary filler.

Scholle Industries
www.scholle.com

Linear wire encoder for packaging equipment

The ELAP HLS linear wire encoder provides a number of pulses proportional to the linear displacement of the wire. The inside spring controls the return of the wire to the starting position. The transducer consists of a bidirectional incremental rotary encoder operated by means of a wire-reel mechanism; the wire is manufactured of stainless steel covered with nylon.

The encoder is suitable for industrial applications which require high accuracy and measuring lengths. It has a high IP rating against environmental agents and is available with strokes ranging from 1000 to 12,000 mm, resolutions ranging from 0.04 to 1 mm and push-pull or line driver output signal.

The types HLS-S, HLS-M and HLS-L differ for mechanical size and measuring stroke. Typical applications include X-Y tables, oil/air pressure cylinders, packaging equipment, woodworking machines, marble and sheet-working machinery. The device complies with CE standards.

Motion Technologies Pty Ltd
www.motiontech.com.au

Systems for beer and CSD

KHS has available specialised systems for the beer and carbonated soft drink sectors.

Specifically for medium-sized breweries, the Innopro Ecostab B provides regenerative beer stabilisation with polyvinylpolypyrrolidone (PVPP). The filter areas on the modular system are smaller than those of comparable systems; the machinery is also gentle on resources and takes up considerably less space.

The Innopro Ecostab C is suitable for the fully automatic production of up to 900 hl of beer per hour. Both Innopro Ecostab machines require up to 70% less PVPP than standard systems.

The Innopro KZE is a pasteurisation system for beer, soda, non-carbonated beverages and juices with and without pulp. Configured to suit the beverages being processed, the flash pasteuriser destroys micro-organisms and inactivates enzymes.

The Innofill Glass Micro DPG can fill glass bottles of beer, mixed-beer beverages and soft drinks at a rate of up to 25,000 bottles per hour. All processes are fully automated and documented and can be re-produced at all times.

The Innokeg Transomat 6/1 is configured for both PET and steel kegs so that the machine yields optimum consumption values at a maximum line capacity of up to 100 kegs per hour.

KHS Pacific Pty Ltd

www.khs.com

Tube filling for effervescent tablets

Romaco has available tube filling systems for effervescent tablets. Three different tube filling systems in different performance classes are currently available in the Siebler MF series. With a maximum output of 120 tubes/min, the Siebler MF 120 is designed for high production speeds. The MF 70 is a mid-range model and the semiautomatic Siebler MF 20 achieves up to 20 tubes/min. All series apply the rotation principle to fill tubes with effervescent tablets. The tablets are first guided through up to eight channels, where they are counted still lying flat down and thus fed to the filling station. They then pass through filling tubes that rotate at high speed. The resulting forces cause the tablets to stand up automatically and slide upright into the waiting tubes, which are also rotating fast. The suction effect of this rotation creates air cushions, which centre the tablets and prevent them from hitting the tube walls. The fragile effervescent tablets are thus processed gently. The products can be packed in either plastic or aluminium tubes and a range of products in different sizes and shapes can be handled. There is no need to change the format parts in order to fill tablets into different tube lengths; and filling volume — which varies from 5 to 30 tablets — can be adapted according to the tube size. All machines have a modular architecture and can be upgraded with numerous options for feeding the tablets, tubes and caps. The level of automation for controlling the system is also configurable.

Concept Automation Pty Ltd
www.conceptauto.com.au

Cheese packaging helps fight food waste

When consumers buy food in bulk, the ability to confidently reseal the package to keep food fresh is critical to preventing food waste.

US cheese manufacturer BelGioioso sought a packaging solution that was suitable for its Mild Provolone bulk sizes sold at club stores. Bemis Co developed a packaging solution using DuPont Selar PA and DuPont Bynel in a resealable package.

The package is made up of two individually sealed compartments with reseal technology that enables the user to easily peel and reseal the package 20 times or more with fingertip pressure. The package is also perforated, allowing consumers to separate the two compartments without using a knife or scissors.

Bemis' SmartTack EZ Peel Reseal technology allows the individual cheese compartments to be sealed separately, preserving the freshness of the unused portion until opening and reducing food waste - all while creating differentiation at the club store level for BelGioioso Cheese.

"High-performance materials add value to packaging in many ways, but especially in protecting food and keeping food fresher and more appealing longer," said Yasmin Siddiqi, global packaging relationship manager, DuPont Packaging & Industrial Polymers. "As the packaging industry converges on this global issue, more and more solutions like this resealable system will be required."

DuPont Selar PA was selected for improved formability and puncture resistance and Bynel was selected for its performance as a 'tie layer' to help bond dissimilar materials.

The packaging was recognised with a Silver Award at the 2015 DuPont Awards for Packaging Innovation, demonstrating excellence in the Enhanced User Experience criteria. Judges said the entry delivered on its promise to provide convenience, value and freshness.

"These club-sized, dual packages can be easily separated for storage and use. And, due to the resealable technology, the cheese stays fresh after multiple openings, avoiding food waste," said Jane Skelton, head of print and packaging, Sainsbury, UK, speaking as a representative of the 2015 DuPont Awards judging panel.

DuPont (Aust) Limited
www.dupont.com.au

Brewery ditches labels for premium beer in sustainable PET

Belgian brewery Martens sought to create a premium look and feel for its Martens Pils product while continuing its commitment to sustainability.

Utilising its existing Direct Print industrial-scale digital printing technology from KHS, the company has eliminated labels altogether, producing a visually appealing, premium and more sustainable PET package.

The new digitally decorated PET format fulfils the brand's desire to pursue innovation in technologies, processes and products.

This packaging change follows on from the brewery's 2015 launch of Dagschotel beer packaged in high-quality digitally printed PET bottles that were brought to life with the help of a smartphone app which recognised pixel patterns on the decorated bottles to create animated bottles. Bottles were printed with characters from a popular TV sitcom; scanning two bottles together brought lively exchanges between the characters.

KHS Direct Print is an industrial-scale, digital printing process with low-migration LED UV-cured inks for food-safe decoration of PET bottles.

KHS Pacific Pty Ltd
www.khs.com

Identification solutions for reliable data acquisition

SICK Pty Ltd

As well as being used in the food industry to trace foodstuffs reliably, RFID technology, laser-based barcode scanners and image-based code readers can also be used to optimise production and packaging processes. Flexibility is a must in the food industry as one form of technology may be more suitable than others for certain processes. This is facilitated by uniform connectivity, an identical user interface and a uniform accessory concept.

Laser-based barcode scanning

Identifying products by barcode

The barcode is the oldest of the product identification data carriers, and it has been widely used in industry and trade since the 1970s. Nearly every consumer good is labelled with the EAN-13 barcode, which is valid all over the world and which encodes the GTIN (Global Trade Item Number), a globally standardised part number.

Thanks to barcodes, food is now labelled uniquely, reduced process errors have led to a higher degree of safety, warehousing can be automated, it is easier to move goods and, most importantly, products can be read incredibly quickly using laser scanners. If a product is recalled, the automated identification of the products involved and their distribution channels makes it possible to speed up all of the necessary measures. Giving each product a unique mark also has an impact on production, as the items have to be marked, read, verified and saved in the production line.

The Australian distribution centre of a large food company takes in 10,000 pallets each day, each of which is about 2 m high and loaded with different products, which are all provided with their own barcode. If a product is labelled incorrectly, this could mean that the wrong item is delivered and could make it extremely difficult to trace. Similarly, food that is not labelled correctly can trigger foodborne illness. An error rate of 2% would mean that 73,000 pallets would have to be taken apart, manually processed and inspected each year.

Checking codes on cheese labels at Arla Foods

In the Arla dairy in the Swedish town of Götene, up to 3000 cheese packets are weighed and labelled correctly every hour. No cheese can be made available on the market without a complete and clearly readable label. The print-and-apply machine manufacturer Autolabel AB developed a labelling system for Arla which works with photoelectric sensors, 2D vision sensors and barcode scanners from SICK. The CLV622 barcode scanner checks whether the label is in the right place and whether it is readable. Cheese packets with non-compliant barcodes are rejected automatically.

Waterproof reading performance

In the wet areas of dairies, slaughterhouses, meat-cutting plants,

© Stock.Adobe.com/au/Ingo Bartussek

filling lines or food-processing facilities, barcode scanners must deliver impressive reading performance, even under the harshest of conditions. As the systems are cleaned frequently and intensively, the machines and their components are constantly exposed to water jets and aggressive cleaning agents. The stainless steel housing of SICK's CLV62x to CLV64x barcode scanners provide chemical material and corrosion resistance, ensuring reliable code reading, even in harsh conditions. Maier Packaging GmbH from Germany has developed a component for identifying barcodes on aluminium yoghurt pot lids. This component was designed to be used in the packaging system of the European market leader for dairy products. The company chose to integrate a SICK CLV scanner solution for wet areas as the pots and lids are cleaned in PSDI mode before the yoghurt is added and the lid is affixed. Once the lid has been affixed, the barcodes are read while the machine is at a standstill. The scanners are protected by IP69K housings with a plastic disc that can be cleaned using high-pressure cleaners and are resistant to acids and cleaning agents. The CLV6xx barcode scanner can also cope with the cold, and is suitable for use in freezers down to -35°C.

> *"Thanks to barcodes, food is now labelled uniquely, reduced process errors have led to a higher degree of safety, warehousing can be automated, it is easier to move goods and, most importantly, products can be read incredibly quickly using laser scanners."*

Image-based code reading

Identification in the second dimension

Alongside the traditional barcode, the food industry also uses 2D codes to ensure traceability and process reliability. While barcodes only code data in a single dimension, 2D codes map data in symbols, in a two-dimensional area that provides higher information density.

The data from a 2D code can be read using image-based code readers and processed further electronically. In the food industry, the use of data matrix codes is most common in intralogistical and packaging processes. QR (quick response) codes, are used on food packaging for mobile tagging so that consumers can trace a product with ease.

In the European Union, foodstuffs must be marked with a best-before date. In Germany, the Batch Marking Regulation also applies, requiring all foodstuffs to be provided with a batch number assigning the product to a production run. Both the best-before date and the batch number are marked on the product in plain text. Image-based code readers read barcodes, 2D codes and plain text automatically, shorten the processing times and therefore increase productivity.

Flexible, compact and well connected

The Lector62x image-based code reader from SICK is highly flexible. Using various image processing algorithms, it reliably identifies all types of codes used in the food industry, including barcodes (1D), Data Matrix and QR codes (2D), as well as plain text. The Lector620 High Speed variant reads codes at speeds of up to 6 m/s. Live images make it possible to analyse the code quality and reading performance, and images can also be saved for data archiving purposes.

Tracing fish specialties with mobile tagging

German frozen fish processor Femeg uses QR codes on its frozen-food packaging to provide the retail customer with extensive information about the origin and catching conditions of the fish via a smartphone app. In order to ensure that the QR code is also readable on the manufacturer's fish packaging, the Lector620 Professional image-based code reader from SICK checks it during the packing process.

© Stock.Adobe.com/au/Robert Kneschke

Traceability and intralogistical process reliability at Goedegebuur

In the packaging line of the meat processor Goedegebuur, based in the Dutch city of Rotterdam, code readers from SICK identify small 2D codes measuring 18 x 18 mm. As part of the intralogistical reorganisation of the packaging line, these codes were added to the labels in addition to the previous barcodes. Despite being mounted at a tricky angle, the Lector620 ECO still produces excellent reading results, providing an interface between the machines, transport components and the PLC on the one hand, and the warehouse management software and the order processing system on the other.

Sleeve identification with A+F machines

A+F, from Kirchlengern in Germany, is a leading supplier of end-of-line packaging machines and systems. Seeking flexibility when switching between codes, reliable omnidirectional reading characteristics and a compact design, A+F opted for the Lector620 Professional image-based code reader when equipping its SetLine sleeving systems.

As yoghurt manufacturers, for example, switch between different products and container sizes, the corresponding sleeves which end up on the yoghurt pots are identified by eight code readers and confirmed as correct before being unfolded in the sleeve application station. This means that a raspberry yoghurt will not end up with a sleeve for a lemon yoghurt.

Although the position and orientation of the barcodes and 2D codes vary, the Lector620 Professional can identify them with very little trouble. Furthermore, it monitors the print and contrast quality of the codes on the sleeves. If the code readers catch several incorrect sleeve types, the system stops and the machine operator checks the infeed of the carton magazine. This enables A+F to achieve a high degree of packaging reliability and avoid waste.

Quick reading rates are the bottom line

Laser-based barcode scanners from the CLV6 series feature an extensive depth of field and reading field width. The wide aperture angle enables one device to cover the majority of conveyor belt widths. With excellent reading properties and reading rate of 99.98%, the barcode scanners ensure that data is gathered reliably — even with poor quality or damaged barcodes.

Reliable reading is guaranteed with foil-protected codes and other reflective surfaces, collecting relevant product data in a time-efficient and cost-efficient way. With 4Dpro compatibility and a high level of user-friendliness, the barcode scanners enable flexible product changes without disrupting the process flow significantly. The high scanning frequency allows fast process speeds when identifying containers, for example, and the scanner can handle large reading distances and low-contrast codes — which may occur when identifying pallets, for example.

SICK Pty Ltd
www.sick.com.au

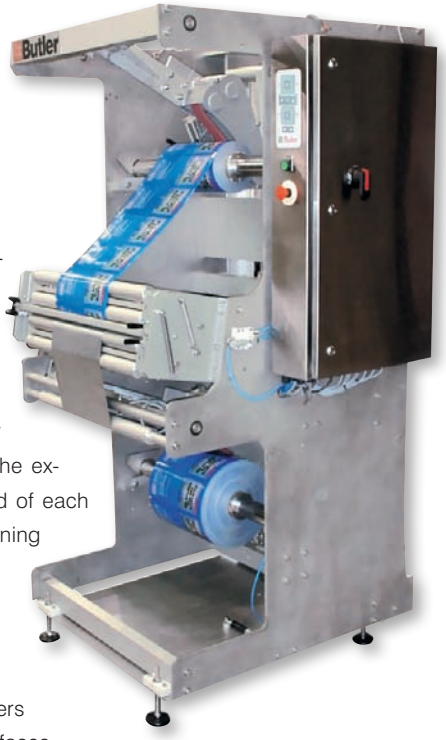
Stretch wrapper range

Fromm Packaging Australia has announced a range of stretch wrapping machines available for rental.

The FSW-10 is an entry-level machine suitable for small businesses, with a simple one-touch operation. The FSW-13 and FSW-30 machines are suitable for most wrapping applications, from tissues to bricks. The FSW-50 is the most comprehensive machine from the range — pallets can be wrapped, cut and wiped in a single process. With remote operation, the operator doesn't have to leave the forklift, making it easy to use.

Fromm Packaging Australia

www.fromm-pack.com.au



Automatic film splicer

Butler Automatic has available the SP1 Series Automatic Film Splicer, suitable for pet food packaging applications. The splicer increases efficiency in packaging operations by eliminating the packaging line downtime caused by manual film roll changes.

With a simple mechanical design and high-quality manufacture, the splicer senses the diameter of the expiring roll of film and automatically splices the end of each expiring roll onto the new roll. It is capable of running at speeds of up to 182 m/min.

In addition to the standard splicer, the company has available the SP1 RB, designed for full wash-down capability. It features mostly stainless steel construction, with only specific splicing head cylinders using coated aluminium, and has minimal flat surfaces.

Butler Automatic Inc.

www.butlerautomatic.com

Anti-glug pouring system

Class Plastics has launched the Anti-Glug Pouring System, suitable for the industrial cleaning, agricultural and food sectors. The system ensures a smooth, continuous flow of liquid, as well as reducing spills and unnecessary waste.

Available in 15-, 20- and 25-litre models, with a 63 mm neck, the receptacle is manufactured from HDPE. Suitable for dangerous goods, it features a sunken handle and has a 5-year shelf life.

Class Plastics Pty Ltd

www.classplastics.com.au

Juice brand relaunches with Tetra packaging

When Japan-based Kagome wanted to relaunch its YASAI SEIKATSU 100 series of juice products, the company updated both the ingredients and the packaging, becoming the first product in Asia to adopt the Tetra Brik Aseptic 200 Slim Leaf.

"The renewed product contains carrot fibre, which give a new experience to consumers as if they are eating vegetables," explains Kouta Hayashi, beverage product planning, consumer division of Kagome.

Kouta said the leaf-shaped panel on the Tetra Brik Aseptic 200 Slim Leaf carton enabled the company to emphasise a keyword that describes the product's main benefit, providing increased visibility on the shelf without altering the brand image.

"With this innovative package, we will highlight the attractiveness of this constantly evolving product to new customers. In addition, the products with this new package feature the FSC label, that is promoting our environmental credentials too," said Kouta.

Tetra Pak Marketing Director Yoko Kaji said: "The innovative packaging design provides another element of differentiation that helps Kagome enhance its products' brand image at a very reasonable investment cost.

"It's also a good example of an early success with retrofittable shapes," Yoko said.

Tetra Pak Marketing Pty Ltd
www.tetrapak.com/au

Luminescence sensor

The SICK LUTM luminescence sensor features a miniature housing combined with an IO-Link function. The sensor is suitable for all applications where fluorescent marks need to be detected in confined spaces.

Enhanced system sensitivity enables the sensor to detect the relevant marks even when the level of luminescence is low.

This mini sensor can be set using a straightforward teach-in method. The IO-Link function enables enhanced diagnostics and visualisation of sensor parameters as well as rapid format changes. An increased switching frequency of up to 6 kHz makes the sensor suitable for high machine production capacities.

The technology is used in applications such as the presence monitoring of labels and package inserts in the pharmaceutical industry, detection of invisible marks in the luxury segment of the food and beverage industry and the detection of luminescent marks for positioning of labels in packaging.

SICK Pty Ltd
www.sick.com.au

Thermal transfer ribbon

Markem-Imaje has introduced a thermal transfer ribbon for its SmartDate coders. Extra-resistant, flexible and cost effective, the ribbon is designed to improve thermal transfer printing on flexible packaging and increase production efficiency.

The ribbon is 25% more resistant than other standard market brands, according to the company. Prints are durable and don't rub off regardless of application, wet or cold, dry or humid, or during transportation.

The ribbon is designed to offer extra flexibility — allowing for durable print on most flexible packaging substrates, even the most difficult plastic films and film coatings, and at high speeds, without compromising on legibility. Customers will only need one ribbon grade for most of their current and future packaging needs, reducing errors and inventory-related expenses.

The ribbon is made on an ultra-thin film that provides 83% added roll length compared with standard 600 m ribbons. Customers require fewer line stoppages and benefit from higher production line performance while increasing production throughput by over 90% (based on a standard application). Using ribbon also extends printhead lifetime since it requires less energy to transfer the ink onto the film. Fewer thermal printhead changes will ultimately reduce costs and improve overall productivity.

Available in black and a variety of widths, the ribbon allows for coding of text, logos, high-density graphics and barcodes (including 1D and 2D) at 300 dpi.

The ribbon is compliant with health and food regulations, including RoHS, CP65 and Reach, making it safe for food contact applications.

Markem-Imaje Pty Ltd
www.markem-imaje.com

Food-safe coating for packaging

Ashland has developed Purekote 23589, a coating that can be used safely in food packaging applications. The water-based coating delivers a matte appearance and velvety feel to paper and plastic bags, pouches, lidding films, foil bags and sachets.

Suitable for use with any food, including organic and natural products, the coating does not have temperature limitations. It is print receptive and can be used with film, foil and other substrates. It can be applied via a gravure or flexographic process with an enclosed-chamber doctor blade.

The coating can be pattern-applied to create packaging with both matte sections and clear windows that allow consumers to see the product inside. Its flexibility in application makes the coating suitable for use on pressure-sensitive labels, boxes and non-food applications.

Certified FDA compliant, the coating is a polyurethane dispersion in liquid form. As a topcoat, it delivers 60° gloss in the 0.5 to 4 range.

ISP Australasia Pty Ltd
www.ispcorp.com

Ampack filling machine delivers flexible productivity for Norwegian dairy producer

TINE SA is Norway's biggest producer, marketer and exporter of dairy products, with a total of 5675 employees and a history dating back 133 years. Established as a cooperative of 15,000 Norwegian milk farmers, TINE SA processes 1.4 billion litres of cow's milk and around 19 million litres of goat's milk every year to produce premium dairy products.

The portfolio encompasses around 200 different products, including yoghurt, sour cream and various types of cheese, which are sold worldwide under the TINE brand. Strict controls and state-of-the-art technology are fundamental for the company to guarantee the highest quality.

With growing production requirements, TINE SA needed to centralise production in Oslo and also expand capacity, without compromising the quality, freshness or sustainability of its products.

Set for the future

Havard Lamberg, process engineer at TINE SA, explained that the company had taken over the production of another dairy factory and needed to achieve higher production volumes while also improving hygienic standards. TINE wanted to ensure the best possible cup sealing during the packaging process and needed a new cup filling machine that could be easily integrated into the existing packaging line within a narrow timeframe.

TINE SA sought a partner to implement this ambitious plan and selected packaging specialist Ampack, whose portfolio of Bosch Packaging Technology includes filling machines for cups and bottles, as well as dosing systems and peripheral machines that are used to fill and package highly sensitive products such as clinical nutrition, dairy products and baby food.

TINE SA's new Ampack cup filling machine is an eight-lane inline machine, which can fill pre-formed cups with various products, such as yoghurt products, viscous dessert products, sour cream and cottage cheese. It encompasses the following stations: cup placing, steriliser, dosing device, lid station, sealing station, snap-on lid station, packer and tray transport.

Great emphasis on product quality

"Thanks to the new machine, we can process our dairy products much more efficiently and without neglecting the strict hygiene standards. The system's hygienic design has demonstrated to us that the construction has been well thought out, resulting in an optimised cleaning process with minimal effort. This provides a firm basis and good initial position to bring fresh TINE SA products into the refrigerator," said Havard Lamberg.

Higher productivity and flexibility following trouble-free commissioning

The ability to combine maximum productivity with a high level of flexibility was vital for TINE SA. Whereas the old machine could only process up to 12,000 cups/h, the new packaging line is designed to handle 18,000 cups/h. Several

different cup formats, as well as different packaging materials, can also now be processed by the same machine.

The larger reserve magazine for the packaging material is a further advantage, contributing to the high level of user-friendliness. Despite TINE SA seeing an increase in its production margins, the effort required by the operating personnel remains about the same and the compartment only has to be refilled every 12 to 18 minutes.

"When a company increases its production capacity, by implication this also usually results in a need for more operating personnel, which adds to personnel costs. This wasn't the case for us," explained Havard Lamberg. "Since the layout of the new machine replicates the previous one, control and operation remain pretty much unchanged. Our employees were therefore able to work with the new Ampack technology without any problems." The high-performance system runs a two-shift operation for five days a week, with machine stops kept to a minimum and therefore very low usage downtime.

TINE SA was able to increase production in line with objectives — and without significant production losses during the installation phase. Bosch Packaging Technology is distributed in Australia by Nupac Industries.

Bosch Packaging Technology
www.boschpackaging.com

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Markem-Imaje Pty Ltd
www.markem-imaje.com

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Glass-bottle filler

Krones has developed an automatic probe adjustment feature and a fully automated CIP cup mechanism for the Modulfill HES glass-bottle filler.

Utilising probe-controlled fillers enables precise adjustment of the fill level in the bottle and can result in substantial time savings when changing over to a different container, via a process in which a linear motor is used to change over all the valves simultaneously at the touch of a button. This feature enables the probes to be moved to a comparatively high position, freeing up space at the valve outlet for automatically fitting the CIP cups. During production mode, the CIP cups are 'parked' in a readiness position behind the valves. For CIP mode, they are fed in fully automatically using a swivel mechanism and pressed against the valve.

The system provides gentle, foam-free filling and accurate fill quantities. The glass bottle is pre-evacuated twice using an interposed CO_2 flushing feature for minimised oxygen pick-up, creating a vacuum of <100 mbar, before the filling function starts. Two different speeds guarantee optimum flow behaviour. Diaphragm valve technology eliminates turbulence when switching over to a different speed. Swirl inserts in the valve ensure low-foam, low-turbulence filling.

Separate gas paths for pressurisation and snifting contribute towards high levels of hygiene and filling stability.

JL Lennard
www.jllennard.com.au

Container deposit scheme: the state of play

Mike Ritchie, Director, MRA Consulting Group

The NSW Government announced in February 2015 that it had a preference to introduce a container deposit scheme (CDS). That announcement was endorsed by the Opposition. So what is the state of play beyond NSW?

- The Queensland Government has said it will model its system on the NSW model;
- The Northern Territory has now introduced its own system after a false start and a legal challenge by the packaging industry (the courts found the original design fell foul of the interstate Mutual Recognition Act);
- South Australia has had a system for decades, operating well although relatively expensive;
- The ACT would be likely to follow the lead of NSW in its CDS;
- The state government of Victoria has rejected proposed state-based systems and the Environment Minister has declared that it is "unconvinced that the way to [increase the beverage container recycling rate] is the container deposit scheme";
- The Western Australian Government will not pursue a state-based CDS while a national system is being pursued; and
- The Tasmanian Government considered implementing a CDS, but after a study suggested it would come at a high cost to consumers, it decided not to proceed.

So, five out of eight states/territories are seriously considering change.

MRA Consulting completed a study for the Local Government and Shires Association of NSW, which showed that local government and MRFs would be better off under a CDS (so long as MRF operators could redeem deposits). The reason: even though 83% of eligible containers are redeemed outside of the kerbside system, the 10 c redemption on each container left in the kerbside recycling bin is worth more than the value of the glass, plastic, etc as a raw material. So the value of the recycling bin's contents increases under a CDS and that gain is shared by the industry and councils.

At this time, the NSW Government has not proposed its preferred model for a CDS. The packaging sector has proposed 880 reverse vending machines (RVMs) to be spread across NSW. That is not very many. So clearly this model is focused on public place recovery of containers (and not as a replacement to kerbside recycling).

It is a very different model to that enunciated by local government and the Boomerang Alliance, which see a full container collection infrastructure built (via RVMs) across the state to replace most of the collection of containers via kerbside recycling.

It is of course possible to sequence both — to start with public place RVMs and gradually increase their abundance. The higher their density, the more they will extract from kerbside bins. The scheme design issues yet to be clarified are:

- Should there be a 10 c deposit at all; why not a donation to charity instead?
- Should all kerbside containers be eligible? (eg, why include 3 L milk HDPE containers — they are rarely littered)
- Should the scheme be mandatory or voluntary?
- Should MRF operators be involved as service providers?

Each of the above is subject to conjecture and debate. What we do know is that the NSW Government has agreed to set up a technical advisory committee to review options. It will spend time consulting with stakeholders before providing recommendations on final design to the NSW government.

This debate has been ongoing for 15 years — far too long in my view. Simply put, we need a system that is cost effective; reduces litter; supports positive action by consumers and community groups; and does not lead to perverse economic outcomes.

It is important to remember that packaging represents just 4% of the waste sent to landfill. A brilliantly run CDS will have a very small impact on waste to landfill. (It is swamped by organic waste, which represents 60% of waste to landfill.)

So is it worth doing? Yes — but as one small step in a much longer journey, of creating a circular economy based on economically sustainable and efficient resource recovery.

MRA Consulting Group
www.mraconsulting.com.au

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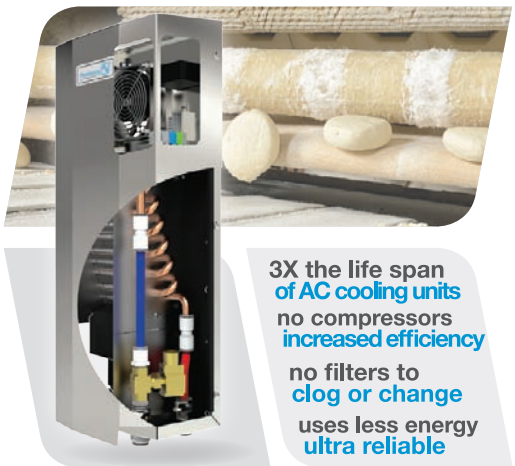

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HIPSTER wants to change the face of food processing

When it comes to food, at least in a Western context, we want it all, we want it now and we want it chemical-free. Consumers do not want to be limited to eating only local and seasonal produce; however, they expect their food to make its journey in an unadulterated state, and with colours, flavours and textures intact.

Against this backdrop is the necessity for food to be safe from bacteria.

The fight against food poisoning

About 75% of the new diseases that have affected humans over the past 10years have developed from animals or products of animal origin.

According to the EuropeFood Safety Authority (EFSA), Campylobacteriosis remains the most commonlyreported foodborne disease in the European Union, with over 190,000 human casesannually. Common routes of the bacterium are raw milk and undercookedpoultry.

Salmonella, often transmitted by eggs, is the second most commonintestinal infection, with over 100,000 human cases reported each year.

Listeriosis is also causing great concern, and continues to rise in Europe.In 2014, there were 2161 confirmed cases, resulting in 210 deaths, the highestannual number reported since 2009. Dairy products, vegetables, fruit andseafood are the possible vehicles of the infection.

"Globalisation and the movement of people have brought about trade infood, but there are also the chemical and biological hazards that come with it— and they know no borders," explained Marta Hugas, head of theBiological Hazards and Contaminants Unit at EFSA.

For food processors, the challenge is huge. "Consumer preferences forconvenient food that is easy to prepare, but as fresh as possible and minimallyprocessed, are sidelining techniques like freezing, canning and chemicalpreservatives. Such techniques are very effective in terms of safety but mayaffect food quality and taste. Now we have to create new technologies to meetthese demands and to ensure the long shelf life required by distant exportmarkets," said Geraldine Duffy, researcher at the Head Food SafetyDepartment of the Teagasc FoodResearch Centre in Dublin, Ireland.

Duffy's department is contributing to a European project calledHIPSTER, which isattempting to validate and implement a food processing technology combininghigh pressure processing (HPP) with temperature (HPT).

A century-old technique…

Using high pressure to preserve and sterilise foods is a century-oldtechnique known as high pressure processing (HPP) or Pascalisation, from the17th-century French scientist Blaise Pascal, famous for studying the effects ofpressure on fluids.

Applied to certain foods, high pressure can render inactive somemicroorganisms such as yeast, mould and bacteria, and some enzymes too, whichcontribute to deteriorating foods when processed.

In Japan since 1990, HPP has been used to preserve some juices, jellies, andjams; it is now used to preserve fish and meat, salad dressings, rice cakesand yoghurts. In the US, the technique has been used for guacamole: it did notchange the taste, texture or colour, but the product's shelf lifeincreased from three to 30 days.

High pressure prolongs guacamole shelf lifefrom three to 30 days. Image credit: Sweetonveg

However, HPP has its limitations. After HPP, most of the enzymes are intact,which means the colour and texture (and also flavour) are not stable duringchilled shelf life. Another important difference is food safety of non-acidicproducts, like vegetables or meat. Due to bacterial spores, non-acid food isnot safe after HPP treatment.

…with a modern twist

Enter the new version of HPP, the snappily-named 'high hydrostaticpressure in combination with temperature' (HPT) technique, which adds aheating step to the high pressure processing.

The combination of a preheating stage and high pressure is expected tosterilise food products and ensure greater food safety, freshness andnutritional quality, while extending shelf life. In addition, HPT promises tobe environmentally friendly thanks to its low energy costs and reduced waterconsumption.

"We are testing its efficacy on prepared meals with extended shelflife, including soups and ready-to-eat meals that contain chicken and fish. Ifthe HPT technology works, it could be applied to other foodstuffs in thefuture," explained Duffy.

The high hydrostatic pressure on its own inactivates vegetative bacteria onthe food, but not the spores that could make it unsafe or lead to spoilage.

Thus, scientists are investigating if submitting the food product to thehigh pressure treatment, in combination with temperatures of about 90°C,will inactivate such spores while guaranteeing quality, safety and taste and inaddition to giving a long shelf life — conditions that are much valued bythe market and the catering industry.

HPT promises much, but has not yet been scaled up and fully implemented intothe food industry to be compared against existing food processingtechniques.

The HIPSTER project

The European HIPSTER research project is aimed at validating, implementingand marketing this new method. Nine European partners (five industries and four RTD organisations) willwork together until August 2017, to implement HPT in the food industry onan industrial scale.

HIPSTER addresses the main barriers preventing the first market introductionand full deployment of HPT. The project will focus on the followingactivities:

R&D:

Identify process windows (pressure/temperature/time) ensuring inactivation of pathogens and spoilage microorganisms using defined model systems and real foods.

Prototyping:

- Engineering and construction of a full-scale HPT equipment unit suitable for processing at different pressure/temperature ranges. The equipment is based on an innovative design of the vessel. Include auxiliary units for the preheating and cooling.
- Construction of tools (sensors, gauges, etc) for process monitoring.
- Develop a public database containing microbial kinetic parameters determined under well-defined processing conditions for guidance to food industry and control authorities.

Validation:

- Pilot and industrial scale testing of HPT treatments.
- Experimental production of a range of new food products (ready-to-eat and ready-to-use fish, meat and vegetable products).
- Shelf life studies.
- Viability study: compliance with legal requirements, economic feasibility and sustainability.
- Demonstrating in full-scale operational conditions the sustainability and techno-economic feasibility of the equipment and tools developed in collaboration with end users from the food sector.

Dissemination and exploitation:

- Communication of the technology to the broad public.
- Market plan to be deployed by each of the industrial partners.

Meanwhile, elsewhere in Europe

In the fight to keep food safe, clean and marketable, Scientists working forthe project i3Food aredeveloping three different technologies: pulsed electric fieldpreservation (PEF-P) of liquid food products, like fruit juices andsmoothies; high pressure thermal sterilisation (HPTS) for ready-to-eatmeals; and low shear extrusion of cold food products, mainly ice-cream.

Other European research is contributing by improving the monitoringprocess.

"We need sensors to control and monitor the whole process from thebeginning in order to avoid an effect of overprocessing, which could causequality losses in the food product afterwards," explained StefanTöpfl, food technologist at the German Institute of Food Technologies (DIL).

Töpfl said that these techniques will reduce damage to the product byavoiding excess treatment intensity and energy use at every stage ofprocessing.

"I think in Europe we have a high level of food safety, but we nowface the challenge of finding a variety of preservation techniques to maintainthis level while at the same time increasing the quality of the product interms of consumer demands," said Töpfl.

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Digital date sorter

Key Technology's DateSort is a gravity-fed digital sorter for grading dates. The compact and mobile sorter combines mechanical pre-cleaning to remove foreign material with optical sorting to grade dates by size.

The two-stage system features a mechanical pre-cleaning and alignment shaker that removes dust, skins, small rocks and leaves, and divides the bulk dates into lanes for optimal presentation to the integrated digital sorter. Singulated dates freefall from the end of the vibratory conveyor into the sorter, where the camera inspects each date.

The sorter analyses the images, comparing each object to the user-defined size criteria. When dates are identified that are larger or smaller than the target size, the sorter activates the ejector system, which is made up of a series of air jets that span the width of the sorter. While still airborne, the air jets pinpoint the dates to reject and automatically remove them from the product stream. Right-size dates are discharged from the sorter and collected in bins or on a conveyor.

The sorter is an entry-level machine, handles 3-4 tons/h and is designed for use at receiving, where processors collect product from farmers. For processors that pit dates, the sorter is suitable for use upstream of the pitting machine.

The simplicity of the mechanics and water cooling enable the sorter to withstand extreme dust and heat up to 50°C.

Key Technology Australia Pty Ltd
www.keyww.com

Stainless steel hot water hose nozzle

Tecpro Australia's 316 L Stainless Steel Hot Water Hose Nozzle is built with a replaceable, white, EPDM rubber grip. The heavy-duty hose nozzles are designed to take the knocks and shocks of everyday manufacturing and can handle up to 16 bar of water pressure and hot water up to 80°C. The EPDM rubber cover minimises heat transfer, which makes the nozzle more comfortable for users.

The nozzle delivers a high-flow, adjustable water pattern that ranges from a narrow jet to a conical spread with a simple twist of the head. Twist in the opposite direction and the nozzle shuts off securely without leaking.

The nozzle is suitable for use in industries where hygiene is critical, such as the meat, fish and dairy industries, food processors, breweries and beverage manufacturers, industrial kitchens, abattoirs and manufacturers of pharmaceuticals.

Tecpro Australia
www.tecpro.com.au

Peristaltic cased pump for metering and transfer applications

Watson-Marlow Fluid Technology Group has introduced the 530 peristaltic cased pump, delivering flow rates from 0.0001 mL/min to 3.5 L/min, for metering and transfer applications such as addition of flavourings, finings and ferments. The pump offers easy operation and versatility coupled with high levels of accuracy.

Compliance to FDA 21CFR177.XXXX is available on all food and beverage tubing and to EC 1935/2004 on selected materials in the range.

The pump's ability to provide repeatable accuracy helps to maintain a consistent process. Operating parameters can be checked to ensure product quality, while low maintenance promotes greater process uptime. IP66 protection options make it suitable for benchtop or rugged high-pressure washdown areas.

The pumps have the ability to check control parameters and maintain process consistency with visual status through a bright colour display with an intuitive menu structure. Three-level PIN protection assists with process safety and minimises the opportunity for mistakes.

The versatile range of process pumps offers four drive options, enabling users to choose from manual operation to fully automated control. To meet process requirements, the pumps can be fitted with either continuous tubing pumpheads or with LoadSure tube element pumpheads for secure process connection at pressures up to 7 bar.

With integrated PROFIBUS networking capabilities providing two-way, real-time communications, the range offers increased diagnostic capability and faster response. Depending on a user's process needs, the pumps can feature LoadSure tube elements, which use LoadSure D-connectors and an easy-grip clutched rotor, for simple changeovers.

Watson-Marlow Fluid Technology Group
www.wmftg.com.au

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- Increased safety with innovative safe position energy pack.
- Long life-cycle.

Ideal for applications in which operation without a compressed air system is advantageous.

The Type 3360/3361 has both an angle seat and globe valve version.

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www.burkert.com.au

Asahi's thirst for efficiency drives technology investment

Japanese drinks company Asahi Beverages manufactures, markets and distributes a broad portfolio of alcohol and non-alcohol beverage products, including soft drinks, juices, waters, sports drinks, energy drinks, beers, spirits, ciders and ready-to-drink mixed drinks. Employing more than 2500 people across sites in Australia and New Zealand, the business faced a challenge common to many large organisations: identifying and propagating best practices.

To be effective, all sites need to know how they are tracking against performance standards. The sites that are failing to meet standards are the ones that need the most help and support from management.

"In order to propagate best practice throughout Asahi Beverages, I need to know how we are tracking against our performance standards. For this we have developed our own KPI methodology that lets us benchmark our performance at all levels," said Wayne Angus, GM of manufacturing operations.

"The problem we had was that just to calculate and distribute our KPIs every day required tremendous time and resources." To streamline this process, Asahi has engaged Operations Feedback Systems (OFS) to deploy the OFS Software Suite across all of its manufacturing facilities in Australia and New Zealand.

"OFS were able to give us our exact in-house KPIs, in real time, which we see as a game changer. It means that the whole organisation, from myself to every operator are looking at how we are going, all the time, on any web browser. Not only did this immediately save us countless hours daily, but we see this as a key enabler on our best practice journey," said Angus.

OFS - Operations Feedback Systems
www.ofsystems.com

Inline analyser system for edible oil and fat processing

Krohne has introduced OPTIQUAD-EOF 4050 W for the continuous inline measurement of free fatty acids (FFA), total polar material (TPM), peroxide value (POV), moisture or dirt. The optical spectroscopic analyser system is aimed at frying and other edible oil as well as fat applications.

The system measures directly in the pipe: analysis is achieved via an optical window mounted in a standard VARINLINE measuring section. The readings are provided instantly for process control or dynamic control loops via four 4–20 mA outputs. Depending on the application, measurement of anisidine value (AV) and iodine value (IV) are possible. Compared to conventional laboratory methods used to obtain these values, the system reduces the need for sampling, sample transport and handling, and the associated sources of error and costs.

The optical spectroscopy analysing method allows for a range of uses in edible oil applications, such as oil extraction, oil refinement and frying processes up to oil recycling, as well as fat processing. It provides a measuring range of 0–98% for FFA and an accuracy of RMSEp: ±0.03% up to ± 1% FFA, depending on the measurement range.

The system consists of the analyser unit (protection rating IP65/NEMA4X) and the operating unit, an industrial PC with touchscreen display for parameterisation and automatic calibration in a stainless steel housing (IP65/NEMA4X), optionally built into a switch cabinet. It uses up to four measuring methods (transmission, scattering, fluorescence and refraction) with up to 12 wavelengths from ultraviolet to infrared. The underlying calibration is calculated automatically from reference data specific to the application.

KROHNE Australia Pty Ltd
www.krohne.com.au

Vacuum fryer technology for the snack industry

Heat and Control's vacuum fryer technology, Unitized Vacuum Fryer (UVF), enables snack manufacturers to expand their processing capabilities.

With a typical installation capable of processing 500 kg/h of finished potato chips, the system features auxiliary equipment including a Vacuum Generation System, KleenSweep, Centrifugal Oil Filtration System, Heat Exchanger, Fryer Support Module, PLC - System Controls, Automatic Heated Centrifuge and Fryer Support Platform.

With the elimination of an external vacuum chamber, the equipment is easier to maintain and clean, requires less floor space and allows the vacuum fryer to act like a regular 'non-vacuum' fryer.

The technology offers product line extension for snack manufacturers so that high-sugar food products such as apples, carrots, sweet potatoes, high-sugar potatoes and beets can be processed into snack products without over-browning. A further benefit is the ability to minimise formation of acrylamide by frying at lower temperature.

Heat and Control Pty Ltd
www.heatandcontrol.com

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www.krohne.com

Repackaging efficiency and innovation for the meat industry

in Australia and New Zealand

It doesn't come as a huge surprise that the meat industry is big business down under. In fact, Australia is one of the world's largest and most efficient producers of commercial livestock and a world leader in the export of red meat and livestock. According to Meat & Livestock Australia (MLA), the total value of Australia's off-farm beef and sheep meat industry is approximately AU$17 billion.

Neighbouring New Zealand is tracking impressive numbers as well. During the year ended in June 2015, total exports from the sheep and beef industry were NZ$7.3 billion (AU$6.5bn), around NZ$600 million (AU$535m) more than the previous year (according to the Meat Industry Association [MIA]).

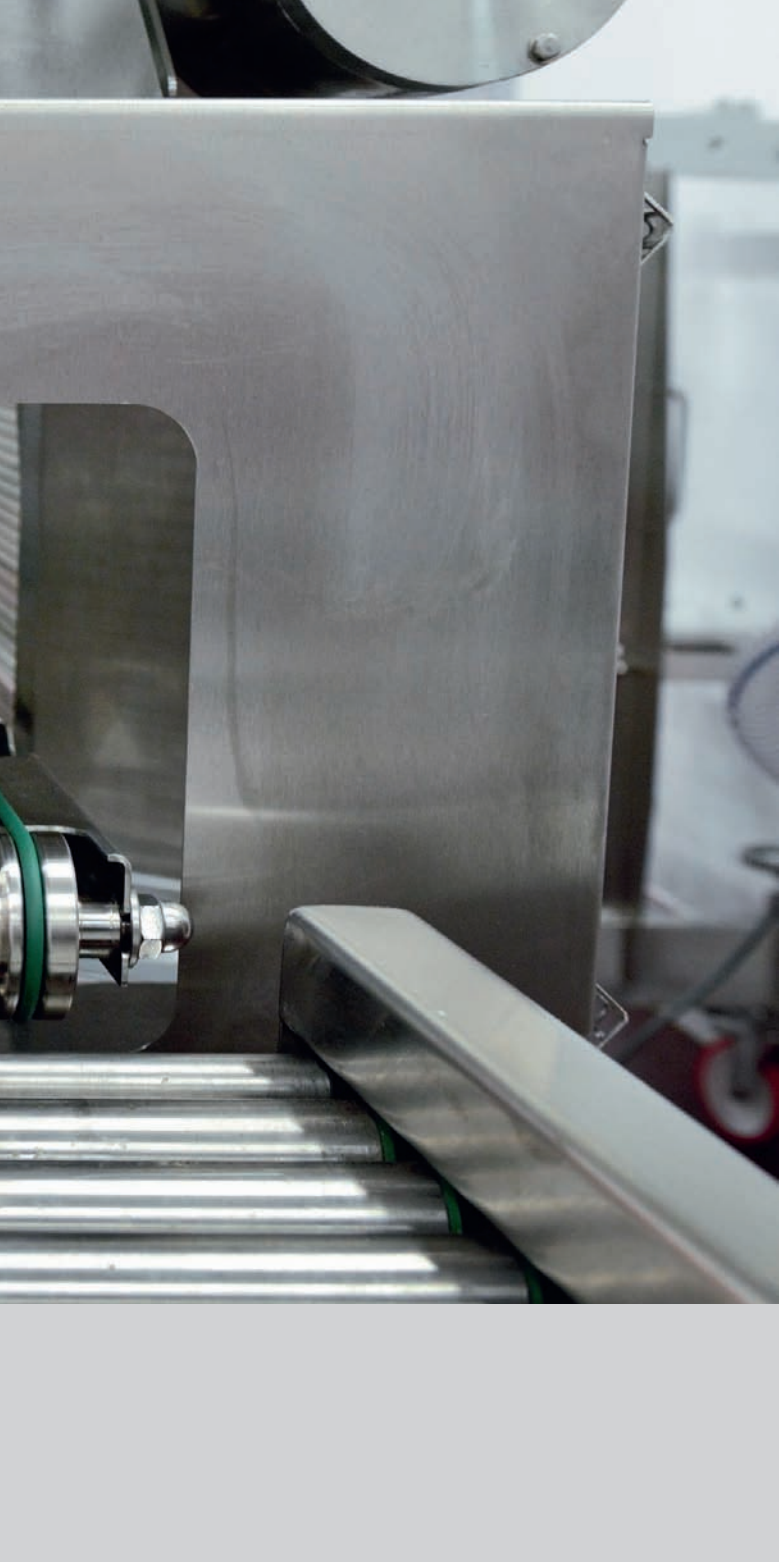
As local meat processors and retailers develop their strategy for the remainder of 2016, a closer look at the effectiveness of their packaging materials and systems should be a key consideration. While often overlooked, enhanced packaging technologies can offer operational and brand building benefits that can ultimately reduce costs and drive sales.

One increasingly popular quality validation solution among Australian and New Zealand retailers and meat manufacturers is vacuum packaging. This format's tight vacuum seal forms a 'second skin' that limits oxygen exposure and reduces product purge. These two parameters are crucial when it comes to extending product shelf life and maximising product freshness.

Unlike traditional modified atmosphere packaging (MAP), skin-tight vacuum seals protect products from freezer burn, allowing consumers the flexibility to store products in the fridge or freezer and potentially capitalise on retail sales and deals by purchasing for future use. For retailers on the other hand, shelf life extension provides longer distribution and merchandising windows — in both instances, product shrinkage and waste are minimised.

Packaging innovations

Over the last few years, the packaging sector has transformed from an industry well entrenched with cans and cartons to a new era of innovative solutions, challenging the way food manufacturers, operators, retailers and even consumers think about packaging. And this trend is no different when it comes to meat packaging.



As a leader in packaging innovations, Sealed Air has recently developed the Cryovac Darfresh on Tray vacuum packaging system, which responds to the growing demand for more sustainable, case-ready packaging for fresh meat.

Key benefits of the new packaging technology

When it comes to processing and packaging fresh red meat, pork and poultry, even the smallest savings can quickly add up. The Darfresh on Tray vacuum packaging system provides numerous operational efficiencies that save time and resources, while reducing waste and overall costs. This drives significant economic benefits for retailers, manufacturers and consumers.

For instance, Darfresh on Tray machines run on average 35% faster than other skin pack and rollstock technologies. This results in:

- increased productivity — more product can be produced in the same amount of time increasing kilograms per man-hour;
- reduced utility costs — less water and electricity are needed in the packaging process on a per kilogram basis;
- reduced capital costs — three Darfresh on Tray machines can do the work of four standard machines (other skin pack and rollstock technologies). With these cost savings most processors will recoup their investment in 12–18 months.

To achieve this, the Darfresh on Tray system utilises a new skin film cutting process. The skin film and preformed tray dimensions align perfectly, allowing for 100% skin film utilisation and therefore zero film scrap. This results in up to 40% less materials being used compared to other skin pack and rollstock technologies. It also reduces the amount of materials being shipped to landfills.

Storage and shipping are essential, though frequently overlooked elements of food distribution. Sealed Air's Darfresh on Tray vacuum packaging system reduces distribution costs by utilising space more effectively. This means that in comparison to MAP, distributors can fit 25–50% more products packaged with Darfresh on Tray into storage and shipping boxes. This saves significantly on costs by cutting down on the number of trucks needed to ship the same amount of meat and contributes to a smaller carbon footprint.

"As the Australian and New Zealand food industries face added pressure to reduce costs, state-of-the-art packaging can serve as a differentiator that delivers value in a crowded meat case," Sealed Air Food Care Market Manager, Ready Meals & Darfresh Paul McGuire said. "Our new Cryovac Darfresh on Tray package offers an unparalleled combination of freshness and retail presentation, enabling manufacturers, processors and retailers to offer customers the highest quality meat and poultry available."

Additionally, Darfresh on Tray more than doubles the shelf life of red meat to keep it fresh for longer when compared to the standard MAP process. This is important for consumers, as it means that meat in this type of packaging will last longer in the fridge and essentially facilitates a more satisfying eating experience due to protein maturation under vacuum conditions. The packaging also guards against freezer burn during frozen storage, which avoids dehydration of the product. This freezer-friendly option is suitable for consumers who many not have the opportunity to use the product before its best for date and allows consumers to benefit from buying on sale.

Wasted efforts

Consumers in Australia and New Zealand are increasingly aware of not only the economic cost, but also the ethical cost of food waste. And considering Australians consume an average of 40.9 kg of red meat each year according to MLA, any way that food manufacturers and retailers can ensure that none of this goes to waste will bring significant cost savings for the meat industry, and ultimately, the consumer.

© FreeImages.com/lockstockb_3

> *The skin film and preformed tray dimensions align perfectly, allowing for 100% skin film utilisation and therefore zero film scrap. This results in up to 40% less materials being used compared to other skin pack and rollstock technologies.*

But there is still a long way to go to ensure this. Each year in Australia, around 4 million tonnes of perfectly edible food ends up rotting in retail and consumer bins, and for New Zealand, it is estimated families bin a total of 122,547 tonnes of perfectly good food every year.

But the waste goes far beyond the groceries thrown in the bin: when food is wasted, everything that was invested in producing and transporting that product is lost. Consider the fresh water, animal feed, man-hours, fertiliser and even the fuel emissions that were part of the process.

From farm to processor to retailer to consumer, food waste is happening at every step in the supply chain. By focusing on innovation and harnessing the power of technology and data, manufacturers and operators can do a lot to reverse this trend. It starts with addressing challenges earlier in the food chain, streamlining operations and ensuring the packaging solutions guarantee the longest shelf life possible to ensure the product can be consumed before its due date.

Labelled for success

Consumers in Australia and New Zealand are also taking greater interest in the origins and contents of their meat products, motivated not only by health and ethical considerations, but a perceived need to validate paying higher prices for value-added products.

For meat processors and retailers, this increased engagement opens the door to leverage packaging as a branding tool and differentiate themselves from competitors. Greater on-package transparency is becoming the norm, meeting growing consumer demand for clean labelling. As a result, headlines such as 'gluten free' and 'organic' are increasingly common.

Active packaging technologies, such as those that remove oxygen or odour from the package, offer another potential avenue to make cleaner label products available. Maximising packaging's branding potential also includes consumer-friendly functionalities. Features such as easy-open, reclosable or portioned packaging can drive consumers to a specific product.

What lies ahead

In such a dynamic, yet heavily regulated and scrutinised industry, packaging technologies will not be the answer for every challenge. However, leveraging innovative packaging solutions to maintain quality, offset labour needs and provide differentiated products is not only vital to meeting some of the meat industry's most pressing challenges, but also in preparing to surpass the global obstacles that lie ahead for exporters.

Sealed Air
www.sealedair.com

© Stock.Adobe.com/au/Oleg Shipov

Food X-ray equipment

FPE has available Eagle Product Inspection's food X-ray equipment product range.

The company's website has a section dedicated to the product range and how food businesses can benefit from X-ray product inspection equipment technology. It features the latest news on product releases, equipment data sheets, new technology updates, case studies, videos and more.

Food Processing Equipment Pty Ltd
www.fpe.net.au

Membrane bioreactor system

The Alfa Laval Membrane Bioreactor (MBR) system enables breweries to treat wastewater on-site using membrane filtration technology. The system enables breweries to save on discharge fees to the local wastewater treatment plant or to safely and cheaply discharge brewery wastewater directly into a lake, watercourse or the sea.

The system significantly reduces the COD/BOD from wastewater. It combines secondary and tertiary wastewater treatment, providing effective filtration down to 0.01 μm and delivering effluent quality that is suitable for re-use.

Options for re-use include: technical/process water for non-sanitary uses such as cleaning water, toilets, irrigation, cooling towers; potable-quality water for use in sanitary-standard processes that include sanitary cleaning and bottle washing (if a polishing step such as reverse osmosis is added).

The system is compact, easy to install and operate, requires minimal manpower and maintenance, and has low operating costs.

Alfa Laval Pty Ltd
www.alfalaval.com.au

Stainless steel changeover and source selection switches

Kraus & Naimer has a range of open and enclosed changeover and source selection switches suitable for most applica- tions, including enclosed Mains – Off – Gen switches with appliance inlet.

The switches exceed the requirements of IEC 60947-3 with positive contact movement during making and breaking functions. The switches have excellent AC-3 and AC-23 making and breaking capabilities and higher dimensioned air and creepage distances for 690 or 1000 V, providing additional safety.

Accessories include gold or silver auxiliary contacts, late break/early make neutral contact, base or panel mounting, door clutches, extension shafts, interlocks, padlockable devices and a range of stainless steel, metal or plastic enclosures.

Kraus & Naimer Pty Ltd
www.krausnaimer.com

Critical asset protection system

Emerson Process Management has introduced the CSI 6500 ATG protection system, a stand-alone machinery protection solution that also allows users to cost-effectively introduce prediction monitoring of critical assets from the same system. Predictive intelligence is a key component to increasing availability and improving the reliability of plant assets.

The system's multifunctional cards can be easily reconfigured for a wide range of measurements, including the impacting or peak-to-peak data used in Emerson's unique PeakVue technology. In addition to monitoring the start-up and coastdown of critical turbo machinery for safe operation, users will be able to utilise the technology to identify the earliest indications of developing faults in gearboxes and bearings.

With the protection system, it is no longer necessary to return to the control room or open cabinets in the field to view or analyse data. The system can be networked over wired or wireless Ethernet to deliver asset health information through a PC or phone application.

To facilitate easy system integration with third-party systems, a secure embedded OPC UA server is included.

The CSI ATG system complies with the traditional API 670 certification and is certified for installation in demanding environments where Class 1 Div2/ATEX Zone 2 approvals are required.

Emerson Process Management Aust P/L
www.emersonprocess.com.au

Automated conveyor belt cleaning systems

Biosteam supplies KHD Conveyor Belt Cleaning Systems — a range of automated systems covering modular belts, flat belts, return mounted systems and bespoke designs.

5-minute set-up and takedown time means that non-skilled staff can quickly and easily clean the belts during unscheduled breaks as well as scheduled cleaning and maintenance routines.

The systems use the power of vapour steam to release contaminants and sanitise conveyors simultaneously. 175°C safe, dry steam destroys pathogens and cleans knuckles and joints. Using just 30 L of water/h, the systems capture the debris in a vacuum for safe and simple disposal.

The conveyor cleaning systems offer the ability to automate a conveyor belt cleaning regime, reduce downtime and product changeover as well as increase hygiene and cleanliness standards. The systems are portable and adjustable, to allow one system to work in numerous areas and various belts throughout a factory.

Biosteam Pty Ltd

www.biosteam.com.au

Large-capacity wastewater treatment system

Aerofloat specialises in simple, affordable wastewater treatment systems using dissolved air flotation (DAF). The technology uses a hydraulic float removal device instead of mechanical scrapers.

Key design features include a compact footprint, low power requirements and a mechanically simple design.

The Modular Aerofloat DAF can treat up to 50 m^3/h and beyond, with minimal moving auxiliary componentry.

Aerofloat (Australia) Pty Ltd

www.aerofloat.com.au

Best practice cleaning
in the food and beverage processing industry

*Murray McDonald**

Cleaning practices are critically important in the food and beverage industry. In this article Murray McDonald brings you up to date with current best practice.

Over the last 10 years, best practice cleaning methods have changed in many industries. Unlike other manufacturing industries, the food and beverage processing sector is getting rid of outdated methods due to a stronger focus on reducing cross-contamination, reducing bacteria build-up and increasing productivity.

For sophisticated and safety-conscious food factories, using traditional tools such as rags, scrubbing brushes and hoses are no longer an ideal fit. The following are best practice cleaning methods to follow for the food and beverage processing industry.

Wet vs dry cleaning

Traditional cleaning methods include hosing down chemical, scraps, oils and grease. The main flaw with this method is that it doesn't agitate the surface, which is fundamental to getting deep within the surface, including any pores and crevices. A process that combines a 4-in-1 approach of washing, scrubbing, steaming and drying food processing equipment and surfaces is ideal. These steps allow for not only sterilisation (if steam temperature is high enough) but a mechanical agitation, which allows for the removal of food scraps, dirt and grime.

When looking at a steam cleaning processes, it's important that 'dry' steam is used. The dry component significantly reduces the risk of residue build-up or the occurrence of moist/wet floors, which can lead to slips and falls.

Another critical factor when it comes to wet vs dry cleaning is that some processing equipment shouldn't get wet. Wet equipment can lead to machinery faults and rust.

Automated and interval cleaning

Traditionally, cleaning could only be done either before production or after, and if it occurred during production hours, machines would need to be turned off for the cleaning to occur.

Inline cleaning systems are modern methods that allow for food and beverage processing equipment to be steamed, vacuumed and removed of any waste in one process, without the need to stop and swap equipment or tools. This greatly reduces the risk of contamination further down the production line. Surfaces receive a deep clean while production is occurring rather than a wipe down at the end. It also reduces resources, labour and downtime.

Validation of cleaning processes

An increase in regular ATP testing is becoming a standard in many food and beverage processing factories. ATP testing allows for microorganisms to be detected and subsequently prevent contamination.

Using invisible or fluorescent lights is becoming a popular auditing tool in industries where contamination prevention or infection is paramount. Some microorganisms can be detected under fluorescent light.

A cleaning audit can also be taken one step further when using florescent tools. Areas to be cleaned in a factory can be marked with an 'invisible marker'. Once cleaning has occurred, a fluorescent torch can be used to see if the invisible markers are still present. If invisible marks are still present, then the surface has not been adequately cleaned.

Stricter infection control procedures

Implementing procedures to 'safeguard' a food and beverage processing environment is almost becoming just as important as the cleaning itself.

An example of a safeguarding process can be seen in the use of ultraviolet (UV) light methods. UV light continues to protect and sterilise an environment post cleaning. If a surface is contaminated during production hours, this leaves 12 hours or more for microbes to grow while the factory is closed for the day or in non-production hours. UV light will reduce the risk of this contamination from occurring by acting as a 'night watch' for bacteria during production downtime.

**Murray McDonald has over 20 years' experience in the distribution of food and beverage processing equipment and is Director of Duplex Cleaning Machines. Duplex is an expert in the distribution of cleaning machine products in Australia and New Zealand and has solved cleaning issues and improved cleaning standards in thousands of industrial facilities.*

Duplex Cleaning Machines Pty Ltd
www.duplexcleaning.com.au

Automated frying and seasoning doubles production for tortilla chip manufacturer

Based in the US state of Illinois, flour tortilla chip manufacturer Donkey Brands was looking to meet increased demand by increasing production levels while maintaining optimal product colour, texture and flavour.

Donkey Brands chose to integrate FOODesign's immerso-cook direct-fired continuous frying system and quik-coat seasoning system. The investment has enabled Donkey Brands to double production volumes by replacing an out-of-date manual process with an efficient automated system.

Customised frying solutions

The FOODesign immerso-cook features a state-of-the-art belt feed system. Customisable for a wide range of products, this feature minimises the risk of product breakage while optimising throughput speeds. Any unpreventable waste that can result from delicate snack applications like tortilla chips is continuously discharged from the fryer by the system's base-mounted mesh conveyor, thus ensuring the product quality is not compromised.

Through its continuous oil filtration process, FOODesign's immerso-cook keeps oil clean with particulate removal and a fresh oil infeed system. This stops the oil from overheating and prevents harmful fatty acids and free radicals from forming, which contaminate oil and compromise the quality of the product. Increased capacity from the immerso-cook, along with its oil-filtration system, means Donkey Brands can produce more tortilla chips with significantly less downtime from changing oil. "With demand growing for quantity and quality, we needed a flexible frying system to build on our capabilities and enhance production capacity," commented Robert Tisljar, partner at Donkey Brands. "Our previous line was predominantly manual and included a smaller fryer, as well as more conventional conveying systems."

Consistent flavour coverage

With a desire to maintain quality in flavour and provide consistent coverage, Donkey Brands installed FOODesign's quik-coat seasoning drum to ensure uniform coating on every tortilla chip produced. The FOODesign quik-coat was designed with flexibility in mind, to suit the unique attributes, product structure, surface and topography of each type of snack product. The system seasons uneven surfaces and gently tumbles the product, evenly dispersing seasoning so that all chips have a consistent appearance and taste.

Seasoning of products brings increased demands for cleanliness, so Donkey Brands was seeking an easy-to-clean solution that minimised downtime. As part of the installation, casters were adjoined to the system so that it can be pulled away from the production line — simplifying and accelerating the cleaning process.

TNA Australia Pty Ltd
www.tnasolutions.com

Where did that foreign body come from?

In the food and beverage industry, foreign body investigations need not be nasty affairs.

Earlier this year, Mars had a foreign body incident that caused the company to voluntarily recall a selection of Snickers, Mars, Milky Way and Celebrations chocolates across 55 countries. This was initiated after just one consumer in Germany reported finding a piece of red plastic in a Snickers bar. After Mars established that the plastic piece came from a protective cover used in the manufacturing process at its Veghel plant in The Netherlands, the company made the precautionary decision to recall all of the 'at risk' product manufactured in the plant. Industry pundits are estimating that the recall will have a significant financial cost attached, certainly running into tens of millions of dollars. The cost comes directly from the recall process, the loss of writing off products and from lost sales in the short and medium term, compounded because the brand damage is occurring in the chocolate boom time in the lead-up to Easter.

Large-scale recalls like this are not good for any company's bottom line or brand image, but in smaller companies the loss of direct revenue, the cost of crisis management, the damage to brand reputation and communications costs are enough to force them into receivership.

You would only instigate this scale of recall if, like Mars, you were satisfied that the problem was genuine, originated in your plant and posed a risk to consumer safety, wouldn't you?

In truth, you can only answer yes to this question if you are absolutely sure of your facts.

'Zero tolerance' is now the norm

Despite the industry's best efforts, it is probably inevitable that foreign particles and matter will periodically be found in food products. Most raw foods and ingredients originate in a natural environment — a farm, an orchard, a market garden… As the food is picked or harvested, foreign objects such as stones or glass can end up comingled and transported into the processing plant. Additionally, objects found in manufacturing facilities can also find their way into the processing stream. Lastly, fragments of bones, pits or shells that are removed during processing can end up hidden in the final products.

Also, the very processing of the food involves a large number of mechanical devices — there are knives, rollers, conveyors, gears and a plethora of other bibs and bobs required in production. And one thing all mechanical devices have in common is that they eventually wear out and have the potential to be the source of a foreign body incident.

HACCP and GMP plans are designed to minimise the risks of contamination incidents, but control of materials in production

environments still presents a major challenge. Consideration needs to be given to the equipment design and certification and design standards which exist to promote hygienic performance (eg, the standards and protocols from EHEDG6, 3-A7 and NSF International8). Adoption of these will mean that your equipment has been designed and constructed to reduce the potential for product contamination or failure.

Added to this, online systems including metal detectors and X-ray inspection can detect and then prevent many foreign objects from reaching the consumer, but even these can never be a 100% guarantee that a product will be contaminant-free.

Prevention and elimination of foreign bodies

A foreign body incident is not limited to consumers finding something in their food or drink.

A much more positive scenario is when your in-house, online detection systems uncover contaminants. This is a better scenario because the problem has been found and then hopefully solved without the product leaving your plant — so there is no expensive recall and no damage to your brand through unwanted media attention.

A foreign body find in these circumstances can indicate lapses in your quality control systems or be the first indication that a serious contamination incident has already happened.

Whether the contaminant came from an in-house lapse or externally, it is essential that the source of the foreign body be found quickly and conclusively. If the problem is internal, isolating the contaminant source quickly will limit productivity losses and line shutdown time.

> *"Large-scale recalls like this are not good for any company's bottom line or brand image, but in smaller companies the loss of direct revenue, te cost of crisis management, the damage to brand reputation and communications costs are enough to force them into receivership."*

Is the foreign body contaminant complaint genuine?

This isn't a silly question. A 2013 study by Glass Technology Services in the UK found that 70% of fragments reported by consumers and submitted for analysis originated from items that are commonly found in the home. It is a sad fact that sometimes consumers fake contamination complaints in the hope of financial gain, notoriety or revenge for a perceived slight.

If manufacturers can establish with surety where the foreign body came from, they can instigate the most appropriate response in a very timely manner.

What can you do?

Rapid and accurate foreign body identification is the first step. Then you need to ascertain where and when a foreign object in food was introduced — your actions will be vastly different if you establish it originated post purchase rather than within the processing and packaging in your plant.

If you have any doubts about the source of the contaminant, you may have to instigate a costly and damaging recall. So anything that helps you to establish the source of the foreign body will be a huge bonus.

X-ray fluorescence technology (XRF) lets users identify the elemental composition of foreign bodies and now, new handheld XRF analysers are moving this technique from the lab to the production line or field. The elemental composition of foreign bodies (down to around 0.5 mm) can be determined very easily with reliable, low-cost, lab-quality information — giving users a 'fingerprint' of the contaminant.

Fingerprint the plant

Even more importantly, the non-destructive technique can be used to establish a 'fingerprint' library of all of the items on the production line.

Once the user has established this library it can serve as a reference to identify the source of a foreign body. If a cutting blade is shearing and leaving metal fragments in your product, you can take a fingerprint of the elemental composition of the fragment, compare this to your library and determine that the blade needs to be replaced.

If your in-house metal detector picks up the contaminant and you identify the source very quickly using XRF, you can implement remedial action immediately. This will minimise downtime and product loss and the risk of contaminated product reaching the consumer.

In one example, a customer has saved hundreds of thousands of dollars through having invested in the fingerprint library of their most critical and problematic lines. In addition to engineering improvements, this has also minimised cost to the food company by holding manufacturing equipment suppliers accountable, having attributed failures to substandard materials such as lower grades of steel.

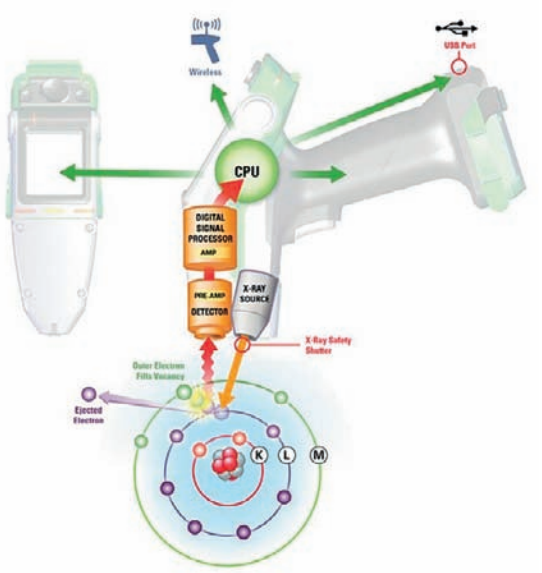
Equally challenging is internal misdiagnosis of foreign body sources; common without the use of XRF. Many contaminants could not have come from your plant or equipment; these can be quickly detected and you can avoid a large-scale recall or time- and money-consuming shutdown.

More detail about XRF technology

XRF can identify a variety of contaminants such as metals, glass, stones, bones, rubber and hard plastics. One of the major advantages of XRF is that measurements can be carried out on solid samples, avoiding sample digestion-dissolution, and results are available almost instantly.

XRF is a non-destructive analytical technique used to determine the elemental composition of materials. XRF analysers determine the chemistry of a sample by measuring the fluorescent (or secondary) X-ray emitted from a sample when it is excited by a primary X-ray source. Each of the elements present in a sample produces a set of characteristic fluorescent X-rays ('a fingerprint') that is unique for that specific element, which is why XRF spectroscopy is so good for qualitative and quantitative analysis of material composition.

To understand how this information can be used, consider scrap metal. Recyclers need to positively identify numerous alloy grades, rapidly analyse their chemical composition at material transfer points and guarantee the quality of their product to their customers. Metal alloys are designed for specific functions that are not interchangeable; small variations in composition can result in significantly different mechanical properties. Luckily, handheld XRF analysers can easily separate these grades and even create your own unique signatures for future identification purposes.



The X-ray fluorescence process

A solid or a liquid sample is irradiated with high-energy X-rays from a controlled X-ray tube.

When an atom in the sample is struck with an X-ray of sufficient energy (greater than the atom's K or L shell binding energy), an electron from one of the atom's inner orbital shells is dislodged.

The atom regains stability, filling the vacancy left in the inner orbital shell with an electron from one of the atom's higher energy orbital shells.

The electron drops to the lower energy state by releasing a fluorescent X-ray. The energy of this X-ray is equal to the specific difference in energy between two quantum states of the electron. The measurement of this energy is the basis of XRF analysis.

Interpretation of XRF spectra

Most atoms have several electron orbitals (K shell, L shell, M shell, for example). When X-ray energy causes electrons to transfer in and out of these shell levels, XRF peaks with varying intensities are created and will be present in the spectrum, a graphical representation of X-ray intensity peaks as a function of energy peaks. The peak energy identifies the element and the peak height/intensity is generally indicative of its concentration.

Modern software solutions enable rapid element identification and quantification. Additional matching algorithms enable a library to be compared against a contaminant creating a 'hit list' of likely candidates.

Energy dispersive X-ray fluorescence (EDXRF)

EDXRF is the technology commonly used in portable analysers. EDXRF is designed to analyse groups of elements simultaneously in order to rapidly determine those elements present in the sample and their relative concentrations — in other words, the elemental chemistry of the sample.

Thermo Fisher Scientific
www.thermofisher.com.au

Easy-clean food-grade brushware

Vikan's Ultra Safe Technology (UST) brushware products are secure, safe and hygienic cleaning tools for the food and beverage industry. The filament retention system is moulded as an integral part of the brush, effectively making it a one-piece brush and eliminating the risk of loose filaments, which can lead to product rejection, recalls and waste.

Manufactured without the use of non EU Food Contact approved resins, the brush head pattern makes the brush easy to clean and dry and improves cleaning efficiency, reducing the risk of product rejection or recall due to contamination from microbes/bacteria, foreign bodies, cleaning chemicals or allergens.

WR&D Wells Pty Ltd
www.wrdwells.com

Metal and contaminant separation

Sesotec supplies detection and separation systems for all process stages, product types and conveying types, as well as for all the critical control points of the production process. The product range includes: magnetic systems, inductive metal detectors and separators and X-ray inspection systems.

Combining ease of operation with high reliability, the contaminant detectors and separators meet all the requirements concerning full traceability and complete documentation of all quality-relevant data.

CBS Foodtech

www.cbsfoodtech.com.au

Hygienic panel consoles

Siemens SIMATIC HMI Comfort INOX panels are suitable for use in food and beverage, pharmaceutical and chemical industries as well as others requiring hygienic production areas.

With food-standard sealing material and shatter protection for the display to prevent contamination of foodstuffs, the panels provide a high standard of hygiene for the food and beverage industry.

The panels meet industry criteria that all equipment and components are easy to clean and disinfect so that cross-contamination of food can be avoided.

The consoles provide an intuitive local operator interface for machines. Using the SIMATIC WinCC Audit option for panels, operator audit trails can be captured as required to assist FDA validation.

The wide-screen devices are available in 7″, 12″, 15″ and 19″ display sizes and are equipped with an analog-resistive touch sensor. Due to a solid membrane, it is possible to obtain the IP66K high degree of protection. Optimised rack design with slight projections to the cabinet allows liquids to run off.

The panels have a smooth 240 grit hairline finish. The membrane covering the display cut-out provides shatter protection, is resistant to chemicals and has minimal grooves and gaps in which microorganisms could settle.

The panels come with a food-standard device seal and rear clamping frame that ensures even application pressure of the seal.

Siemens Ltd

www.siemens.com.au

Food industry research hub

to improve supply chains

An ARC-funded research hub has been established to provide insights into unlocking Asian consumer behaviour and market levers, and informing innovation in ingredient use, consumer experience and product design and packaging.

'Unlocking the Food Value Chain: Australian Food Industry Transformation for ASEAN Markets', launched by The University of Melbourne and Mondelēz International Asia Pacific, will advance the positioning of Australia as a premium brand and lead to a sustained competitive advantage, and will assist the creation of more productive supply chains across the food industry.

The $10 million collaborative research hub includes $2 million funding from the Australian Research Council (ARC) under the Industrial Transformation Research Programme (ITRP).

Research collaboration opportunities for businesses

The research hub is able to assist businesses by conducting research in priority areas.

Mondelēz International and the University of Melbourne have committed to share research outcomes with small and medium-sized enterprises (SMEs) and the wider sector through an open innovation model in a transformational project with national benefits.

It comprises six research streams:

- Consumer Insights develops deep insights into the Asian consumer for application to Australian exporters.
- Market Analytics accesses and analyses intellectual property assets in the Asia Pacific region to deepen our understanding of Asian premium market trends.
- Sensory Analysis works to help partners understand the Asian export market, measuring consumer responses to stimuli, products and brands.
- Supply Chain Management models supply chain decisions to help companies maximise export returns.
- Packaging Innovation works to ensure food security and marketability through innovative packaging.
- Encapsulation and Emulsion helps partners deliver premium product engineering through technology.

The Unlocking the Food Value Chain hub draws on research expertise from five University of Melbourne faculties and schools: Veterinary and Agricultural Sciences; Medicine, Dentistry and Health Sciences; Science; Business and Economics; the School of Engineering as well as Swinburne University of Technology. Mondelēz International contributes extensive research and marketing experience in the South-East Asian region to each of the streams.

Industry services

The research hub is also able to assist businesses by providing market intelligence services. For example, the Market Analytics team has developed a novel intellectual property searching technique that analyses consumer-identified attributes of premium food products to allow businesses to understand food innovation trends and opportunities in China, Malaysia, Indonesia, the Philippines, Korea, Japan and India.

The hub has also refined Qualitative Multivariate Analysis (QMA), a method of comparing the marketability of new and existing products ASEAN markets. The service allows businesses considering export to the region to gain powerful insights into target consumers before committing to expensive in-market research or exports.

Professor Frank Dunshea, hub director and University of Melbourne Chair of Agriculture, said the development of the Unlocking the Food Value Chain hub had been guided by the needs of industry.

"The Australian food industry is driven by innovation — in how we target consumers, in the products we create, in how we market and deliver them," he said.

"Businesses exporting to South-East Asia need to understand their market and how they can deliver the best possible product at competitive prices. This hub provides services which will enable Australian businesses to do so.

"The Unlocking the Food Value Chain hub is working to help Australian businesses create products which have instant appeal for local consumers in South-East Asian nations with technologically advanced processing and packaging."

Professor Jim McCluskey, University of Melbourne Deputy Vice-Chancellor (Research), said the hub had great potential

> *The Industrial Transformation Research Programme is designed to bring minds from many and varied fields — academia and industry — together to solve critical industry problems*

to deliver exceptional outcomes for Australia's food manufacturing industry.

"As Australia's largest research university, we also celebrate the expanding potential for new research collaboration between our three sectors — universities, industry and government," he said.

"I am confident this research hub will help fulfil that potential and bring great results, both in maximising Australia's high-quality food exports and supporting the future food consumers of our ASEAN neighbours.

"We are especially grateful to Mondelēz for partnering with us in this major research effort, as an example of academia and industry working side by side toward important national goals."

ARC CEO Professor Aidan Byrne attended the launch of the Research Hub and said he was left inspired by his visit.

"I was very impressed with the integration both between different universities and the diverse faculties within universities," he said.

"The Industrial Transformation Research Programme is designed to bring minds from many and varied fields — academia and industry — together to solve critical industry problems, and I can see that there is already some great collaborative work underway within this ARC Research Hub to achieve that goal."

Mondelēz International Asia Pacific Director, Research and Development – Chocolate Nicholas Georges said:

"The research hub is an experiment in marrying the best of academia and university research and industry business acumen.

"The early signs of this research, in a small yet convincing way, show we can compete on the world-class stage by leveraging the best we have to offer — talent and technology creation on one hand, consumer understanding and commercial opportunity on the other.

More information on the hub's research capability is available on the Food Value Chain website.

Smart pump

The Aussie I Series smart pump has been released by Australian Pump Industries. Featuring 316 stainless steel casing, the pump is suitable for a wide range of potentially corrosive or difficult-to-handle liquids in applications including aquaculture and oil fields. The pump is flexible and versatile, with internals available in fibreglass-reinforced polyester, polypropylene or Ryton.

Elastomer options, including 'o' rings on the mechanical seal, mean the pumps can be configured to suit a range of difficult liquids. For example, for sea water or brine, Buna N seals are combined with polypropylene internal components (impeller and volute). For concentrated nitric acid, pump internals in either Ryton or polypropylene are fitted with Viton seals.

The pumps will handle a wide range of sodium-based chemicals, as well as urea, vinegar and solutions of zinc sulfate.

The pump offers a maximum flow of 660 L/min, combined with a maximum head of around 32 m. Its efficient, self-priming centrifugal design provides it with a vertical suction lift of 6 m. The double-flush volute provides efficient operation and, combined with the integrated check valve, fast priming.

The porting on the pump is compatible with both 1½″ and 2″ pipework, due to a port design that doubles as a 1½″ female BSP or 2″ male BSP connection. The industrial chemical version is close coupled to 415 V three-phase or 240 V single-phase motors.

Australian Pump Industries Pty Ltd
www.aussiepumps.com.au

Valveless piston pumps for hydrogen peroxide metering

FMI Pumps' valveless, ceramic metering pumps are suitable for metering concentrated hydrogen peroxide (H_2O_2), used in food applications as an effective sterilising agent. Accurate dispensing of H_2O_2 is critical to container sealing during aseptic packaging processes for a variety of food products.

The pumps feature only one moving part, a ceramic piston, in contact with the fluid. Chemically inert and dimensionally stable, ceramics offer good chemical and wear resistance. The pumps also feature the company's CeramPump pumping principle whereby the ceramic piston accomplishes both the pumping and valving functions, eliminating all check valves.

These features make the pumps suitable for OEM sterilisation equipment as they provide maintenance-free operation for millions of cycles, at a precision of 0.5% or better without the need for recalibration.

STAUFF Corporation Pty Ltd
www.stauff.com

Rotary sizing and grading systems

Key Technology has enhanced its Rotary Sizing and Grading Systems including the Sliver Sizer Remover (SSR), Precision Size Grader (PSG) and Rotary Size Grader (RSG). The family of equipment enables fruit, vegetable and potato processors to size and grade product by diameter or length while conveying and removing field debris, slivers, small pieces, fines, seeds, juice and other targeted material.

With a fully welded framework, one-piece block pan, improved water and product deflection, and motor mount with catch pan, the systems improve sanitation and ease maintenance. The framework features integral formed mounting flanges and blind back standoff bosses for mounting the discharge shear. This design creates a rigid frame and enhances hygiene by reducing threaded fasteners and eliminating lamination points between surfaces to minimise areas where water can be trapped and bacteria can grow.

The motor mount features a drip pan below the gearbox with integrated standoffs. The single square tube support is positioned at a 45° angle to shed product and water.

Standard Rotary Sizing and Grading Systems that are adjusted manually feature a hard stop mechanism that prevents an operator from overtightening the adjustment blocks while closing the gap between the rolls, which prevents the blocks from being damaged. The optional Auto Adjust has been improved with the addition of electronic limit switches for full-open and full-closed positions and a mechanical fail-safe detent clutch to prevent blocks from being damaged. Other features include: on-the-fly tuning, no pinch points, self-cleaning stainless steel rollers, sealed corrosion-resistant bearings for low maintenance and easy cleaning for quick product changeover.

Key Technology Australia Pty Ltd

www.keyww.com

Sequential laser engraving for HAACP audit

Detectamet's Detect and Trace system offers laser-engraved, sequentially numbered products to create an audit trail that can be used as part of HAACP.

Laser engraving is available on a range of detectable products, including pens, scoops, scrapers and safety knives. Detectable products can be engraved from 1–50, 1–100, 1–250 or 1–500 as standard.

Inspection Systems Pty Ltd

www.inspectionsystems.com.au

Stainless steel spray gun

Spraying Systems' GunJet CU150A-316 stainless steel spray gun is suitable for clean-up and sanitation in food and dairy processing operations, in internal and external operations.

Options range from a gentle low-pressure spray to a high-impact solid stream. Adjusting the spray pattern from a solid stream to a 50° hollow cone spray pattern can be done by varying the pull of the trigger. Ergonomically designed handles reduce operator fatigue and improve overall control. Textured grips minimise the chance of the gun slipping out of the user's hand. The smooth-pull triggers enable accurate and consistent flow control.

A swivel connector with ring lock is available to lock the trigger in the spraying position. The outer rubber cover comes in either black or white and clearly visible colour bands on the spray gun make for easy identification of flow capacities.

Accessories available include front extensions, swivel connectors, inlet/outlet adapters and strainers.

Spraying Systems Co Pty Ltd

www.spray.com.au

PROCESSING

Ishida weighers quadruple packing speed

UK-based Stream Foods produces a popular range of fruit snacks. Increasing demand for its Fruit Bowl products meant that the factory's existing weighers were struggling to keep up, so the company sought a solution that would deliver both the speed and accuracy it required as well as a rapid return on investment.

The company's choice was a multihead weighing and packing line from Ishida, including a 28-head model from the RV series that is achieving 400 packs/min.

The CCW-RV-228 works in tandem with a 16-head RV model. The 28-head machine weighs primary packs from 16 to 30 g of fruit flakes, yoghurt-coated flakes and raisins and fruit shapes. The 16-head model counts these into groups of 5, 6, 8, 10, 12 and 20 multipacks.

This combination is delivering 80 multipacks/min for five packs and has reduced the demand for the three remaining multihead weighers, which were linked to a counting eye, each of which was only capable of achieving 100 effective primary packs and 20 multipacks/min. These machines have now been redeployed to continue to add value on more specialist products where speed and output are less critical.

While quadrupling the speed of the packing operation, accuracy levels have also been improved. "Product giveaway is a cardinal sin and this is something we particularly wanted to address with this new installation," explained Stream Foods' factory manager Andy Spall. "Just half a gram overweight in a 20 g pack quickly amounts to a huge amount of free product over a single production run. With the Ishida solution, we are now constantly to within a tiny fraction of the target weight."

In addition to the two multihead weighers, the Ishida solution included the supply of conveyors and a flighted elevator, and incorporated Stream Foods' existing Ishida DACS-G checkweighers along with two bagmakers specified by the company.

In addition, Ishida has supplied its IDCS II — Integrated Data Capture System — for the checkweighers, enabling Stream Foods to closely monitor its production and packing operation to provide early warning of any problems that could affect the overall speed and efficiency of the line.

Key to achieving the high speeds has been the effective interface between the 28-head weigher and the bagmaker. The weigher itself is split into four sections, each one delivering 100 packs/min and feeding two timing hoppers positioned above the twin bagmaker. For the bagmaker to keep up with the high speeds of the weigher, it is essential that each drop of product falls as a single slug rather than a long stream. To achieve this, the profile of the bagmaker former was adjusted to enable the timing hopper to sit as low as possible inside the former. This ensures that product falls as a unit and without touching the sides, which could also slow the discharge into the bag.

The new line now requires just five instead of six or seven operators, while delivering nearly four times the output over a 16-hour period than the previous weighers achieved in 24 hours.

Currently the multipacks are put into cases by hand but Stream Foods is in the process of automating this part of the operation as well, to create a fully automated line.

"Ultimately this line has made us far more efficient and for that reason we anticipate a fast payback on the investment," concluded Andy. "Furthermore, as well as the speed and accuracy we needed, the line also gives us the flexibility to respond quickly to customer requirements, for example a special promotion, and also to be innovative in our product development. Indeed, new pack formats are already in the pipeline."

Heat and Control Pty Ltd
www.heatandcontrol.com

Hygienic self-priming pump

The Alfa Laval LKH Prime is a self-priming pump that meets the requirements of a range of hygienic industries, including food, dairy, beverages and home personal care.

Using the combination of airscrew technology, an optimised impeller and casing geometry, the pump provides efficient operation with reduced energy consumption and a low CO_2 footprint. It is EHEDG certified and authorised to carry the 3-A symbol.

Designed for cleaning-in-place (CIP) duties containing entrained air, the device can also pump product, potentially reducing the capital investment when designing process systems.

Quiet in operation, the pump reduces sound pressure levels by 80% when compared to products using traditional pump technologies for CIP/entrained air applications.

Alfa Laval Pty Ltd
www.alfalaval.com.au

High-capacity food processing homogeniser

The Tetra Pak Homogenizer 500 is a high-capacity food processing homogeniser that can produce up to 63,600 L/h. The machine features the HD EnergyIQ, a homogenising device that uses six gaps, rather than one, enabling it to operate at pressures around 20% lower than standard machines. This results in reduced energy consumption and costs.

The lower operating pressure means lower wear. The design incorporates easy service access, maximising uptime. The machine also uses 80% less cooling water and 70% less steam compared to many alternative brands, according to the company.

Tetra Pak Marketing Pty Ltd
www.tetrapak.com/au

Vortex flowmeters with HART 7

Emerson Process Management's Rosemount 8800 vortex flowmeters now offer HART Protocol Revision 7, which allows for easier identification in the field, commissioning and configuration.

Properly identifying devices both in the field and in the control room takes the guesswork out of whether or not the correct device is being configured or commissioned. The Locate Device feature of HART 7 displays a visible code on the device's LCD screen, which allows for quick field identification.

Once connected to the device, or while viewing from the control room, Long Tag allows for a detailed device name to be viewed or loaded into the flowmeter. Long Tag support increases the character limit from the current 8-character tag to 32 characters, allowing the user to create the descriptions necessary to track down each device.

HART 7 also offers greater flexibility for device configuration. For the most up-to-date process information, HART 7 delivers expanded burst mode capabilities to allow the vortex meter to burst up to eight variables and to trigger messages based on process events.

The vortex flowmeter also provides Sensor Signal Strength as a display and output variable. This allows for continuous health monitoring of the flow sensor both at the device and remotely as a HART variable.

Emerson Process Management Aust P/L
www.emersonprocess.com.au

Variable speed drive compressor

The Atlas Copco Z Series variable speed drive compressor has an in-built air drying system and energy recovery.

The addition of variable speed drive technology provides savings in electrical power of up to 35% compared to standard oil-free air compressors, according to the company. Coupled with the unique heat of compression adsorption dryer, the compressor is able to provide Class Zero, clean, dry compressed air for use in food processing applications.

The compressors are sized from 15 to 315 kW and are available as air cooled or water cooled (from 30 kW). Energy recovery systems can be used with the water-cooled versions, which allow up to 94% of the applied electrical energy to be recovered as heat for processing, effectively enabling the use of input energy twice.

Atlas Copco Compressors Australia
www.atlascopco.com.au

Relative humidity probe

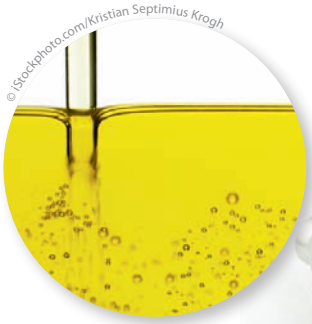
The HygroSmart HS3 interchangeable relative humidity and temperature probe from Michell Instruments is 100% configurable to allow maximum flexibility to the user. This gives users the ability to alter their RH and temperature measurements to keep step with changes or developments in their process.

Users can set the zero/span range, output signals and choose from five output parameters (including dewpoint). All these changes and settings are easily made on a PC via the application software. For users who value simplicity above flexibility, they can order their probes fully configured to their specifications directly from Michell.

The probe also ensures zero process downtime by keeping maintenance to a minimum with an interchangeable sensor. When recalibration is due, the old HygroSmart HS3 sensor is simply exchanged for a freshly calibrated one. This is a simple procedure which allows the probe to remain installed and takes only a few seconds to carry out. Using the replaceable sensor ensures that the HygroSmart HS3 probe has a low lifetime cost, when compared to fully disposable probes. Alternatively, minor calibration adjustments can be easily made on any installed HS3 probe, with a 5-point digital trim adjustment via the application software to ensure maximum accuracy without needing to replace the sensor.

Designed for demanding industrial conditions, the probe features a solid corrosion-resistant body, 10 bar pressure sealing and IP67 pressure rating. In addition, it has an accuracy of 0.8%RH.

AMS Instrumentation & Calibration Pty Ltd
www.ams-ic.com.au



Compact stainless steel sensor for demanding applications

Turck's Q08F is a compact stainless steel housed sensor suitable for demanding applications where standard sensors would not be suitable, or where a more durable sensor could minimise downtime and alleviate trouble areas for customers.

The rectangular sensor has compact housing (32 x 28 x 8 mm), is made from 316 stainless steel and offers an IP68/69K rating. Additionally, the sensor provides a 7 mm sensing range and can be flush mounted to offer a wide range of mounting and application possibilities. With these features, the sensor is suitable for customers in the stamp and die, metal forming, welding and automotive industries.

The sensor has an integrated LED, PUR cable, a PNP or NPN output, and an operating range of -25 to 70°C.

Turck Australia Pty Ltd
www.turck.com.au

Spray-drying atomising nozzles

Tecpro Australia has available RACA International spray-drying atomising nozzles. The nozzle's orifice, whirl chamber and top plate are available in tungsten carbide to avoid rapid wear and performance degradation, while the body is made from AISI 316 stainless steel.

Designed for atomising high-viscosity liquids with values up to several thousand centipoises, the nozzles are suitable for use in countercurrent spray dryers and in systems where multiple nozzle lances are used. The nozzles are available in four different thread sizes using female British Standard Parallel Pipe (BSPP) threads.

Tecpro Australia
www.tecpro.com.au

Versatility facilitates rapid growth

for Australian food processor

An Australian food processor experienced exponential growth after shifting from retail to high-volume manufacturing, and equipment versatility played a large part in the transformation.

For any start-up enterprise, the goal is to hit the ground running and succeed beyond all expectations. The path getting there is often not smooth, nor one with typically fast results. But for one food processor that completely shifted its core business, a single piece of economical yet highly efficient and flexible cooking equipment led to exponential growth.

Such is the case with Wanniassa Wheeler Food, an Australian food processor that four years ago planned to make dramatic changes to its business strategy: shift from being a low-volume supplier for a local franchise food chain to becoming a high-volume food processor providing a variety of culinary and convenience foods to global wholesalers, retailers and other food processors.

This would be a tall order for most companies, but Wanniassa Wheeler had a vision that reconfiguring its 5500 m^2 facility with the proper equipment would enable the creation of a diversified line of cooked protein products while still enabling the company to supply its 47-store chain of Ali Baba QSR (quick service restaurant) outlets. The Ali Baba line includes Lebanese cuisine such as chicken kebabs, kafta fingers, salads and other items aimed at the casual dining segment. The chief idea for the new strategy was to cook protein products including chicken, lamb, beef and turkey in the high volumes needed to satisfy supermarkets, and even big box outlets such as Costco, while also offering quality ranging from restaurant to gourmet level.

"Our experience in cooking various meat products was limited to combination and walk-in ovens, but we knew those would not satisfy our requirement to have a high-care facility," explains Ali Marjan, manager of strategic and business development for Wanniassa Wheeler. "We wanted to minimise product contamination and restrict human handling of products to only placing them on a belt at the front end of the oven. After cooking, the product would automatically be transported to a chilling system and either shipped or stored."

Marjan felt sure that some type of conveyor oven would be the solution.

Spiralling to success

The spiral oven, which offers a minimal footprint, increased yield and product consistency, has been adopted as the continuous cooking system of choice among many ready-to-eat frozen and chilled food processors. It allows them the versatility to roast, steam, bake, broil or even pasteurise ready meals in a single piece of equipment. Examples of the products range from baked quiches, meatballs and chicken wings to oven-roasted vegetables and steamed chicken breast.

Spiral ovens are available in a variety of sizes, but Marjan was inclined to look for smaller sizes that were still capable of producing higher volumes and were easy to operate while cooking a variety of products.

© Stock.Adobe.com/au/antonsov85

After reviewing a range of models, Marjan was convinced that the correct solution for his new operation was the Micro Spiral Oven developed by Unitherm Food Systems. This supplier developed the Mini Spiral Oven prior to the release of the Micro version, which is 1.5 x 2 x 2 m and has over 18 linear metres of belt. Unitherm also manufactures other spiral oven models that are up to 6.4 x 7.9 x 6 m.

One of the features of this oven that Marjan appreciates most is its self-basting capability.

"As you are cooking — particularly when we get into some higher volumes — the self-basting capabilities of this spiral oven help to improve yields," he says. "Because the products travel upward on the belt from the bottom of the spiral oven, as the products cook through, the juices that result from the cooking start basting downward onto the products below. The result is some additional yield, but the more important difference is that you are adding a lot of flavour, which is definitely a winner."

In addition to protein products, Marjan says Wanniassa Wheeler is now roasting vegetables in its Micro Spiral Oven, including items such as eggplant, capsicum, potato and items that are put into Ali Baba dips.

Even though Wanniassa Wheeler's Micro Spiral Oven was capable of cooking up to 280 kg/h, depending on the product, the company's growth rate was so rapid that after just two and a half years, Wanniassa Wheeler was looking to add capacity.

At that point, Marjan says he was convinced that adding a Unitherm Mini Spiral Oven was the right solution. With overall dimensions of 2.4 x 3.6 x 3.9 m, the Mini Spiral would not only increase Wanniassa Wheeler's cooking capacity to approximately 680 kg/h, but it would also address the growing demand for alternate uses, including the ability to provide customers with an in-house test cooking facility.

In-cook food safety

Marjan says another important benefit of the spiral oven is food safety provided by 'in-cook' pasteurisation.

"Since we are a straight cook-chill business, one of the important features of our spiral oven we selected is the 'high-steam' process," he says. "If you compare the spiral oven from Unitherm with a combi oven (combination convention oven and steamer) that has the same functions, they normally remain at 99–100°C. With our Micro and Mini Spiral ovens, the steam goes up to 130°C. A steam separation system allows this high steam to contact products at the beginning of the process, and then they go through a slow process, perhaps another two or three minutes, depending on the product. This process results in what I call an 'in-cook pasteurisation process' that kills pathogens that could survive in a typical cook-chill process. So as long as we chill the product quickly enough, we are able to maintain that high level of food safety."

Opening sales channels

Marjan says that installation of the Micro Spiral Oven got Wanniassa Wheeler up to speed quickly and resulted in its successful entry into the retail segment. Shortly afterwards, the company began to receive enquiries for authentic flame-grilled products.

"Our traditional products were sliced protein products, so having a flame grill allowed us to work with even more meat goods, such as 120 g breast fillet that are flame grilled, and the same with beefsteak products and lamb products that are marked. So the flame grill gives you colour, and it also caramelises to a certain degree. In the end, the appearance was the biggest benefit."

Because the Micro Spiral Oven from Unitherm was able to connect directly to the flame grill, the production line could easily be expanded. This combination of Micro Spiral Oven and flame grill was responsible for opening up new sales channels for Wanniassa Wheeler. For example, some of supermarkets started to work with the company to develop a line of flame-grilled chicken tenders, breasts and wings. Also, Wanniassa Wheeler was able to enter the burger patty market for the first time. One of its new products is a high-end line of wagyu beef burger patties, which commands a high price like Angus beef products, as well as regular beef burger patties.

Marjan says his two spiral ovens were in large part responsible for his company's rapid growth. Not only did this equipment enable Wanniassa Wheeler to exceed its goals quickly, but it also facilitated the addition of the flame grill in an in-line configuration, which allowed the company to expand into additional products and markets. Further, these additional capital investments were able to be implemented without going through the effort of researching and testing equipment from another vendor, thereby getting to market faster and more efficiently.

Unitherm Food Systems ovens are distributed in Australia and New Zealand by Reactive Engineering.

3-dimensional starchless jelly depositing

Baker Perkins has introduced technology to deposit 3-dimensional starchless jellies. The jellies can be made in one or two colours; with stripes and layers; with solid or soft centre-fills; and with inclusions such as real fruit pieces. The process uses quick-setting jelly formulations, typically pectin or carrageenan based.

Product possibilities include balls or spheres; fruit shapes such as raspberries, strawberries and pears; animals and cartoon characters.

Designs can be visualised and models made quickly using 3D CAD and 3D printing, which is also used to make test moulds for trials.

For fast changeover between production runs, the mould system uses clip-in moulds, allowing the replacement of just the moulds rather than the complete carrier system. This widens the range of products that a single line can produce, and this versatility may be enhanced by the ability to deposit multiple shapes in different colours simultaneously. Air ejection from the mould is hygienic and ensures the product is undamaged.

With outputs ranging from 100 to 1000 kg/h, initial low outputs can be scaled up. Accurate cooking and depositing techniques ensure weight and dimensional accuracy, no shrinkage and enhanced definition for intricate product shapes. The products are deposited as final solids so no drying is required.

Starchless depositing is hygienic with a fully automatic wash-through function, non-contact ejection system and no recycling of starch.

Baker Perkins

www.bakerperkins.com

Internal mix deflected flat fan atomising spray nozzle

EXAIR's 1/4 NPT Internal Mix Deflected Flat Fan Atomising Spray Nozzle atomises fluid and sprays at a right angle to the nozzle orientation. This allows spray to be placed precisely where it is needed when the mounting and work areas are limited. The nozzles are suitable for coating the inside of enclosures and ductwork. They combine liquid and compressed air inside the air cap to produce a fine mist of atomised liquid. The nozzles provide liquid flows from 6.8 to 26.1 L/h.

The nozzles are suitable for coating, cooling, treating and painting a variety of products, including water, light oils, rust inhibitors, chemicals, paints and dyes, using compressed air and liquids with a viscosity of up to 300 cP.

Durable and corrosion resistant, due to their stainless steel construction, the atomising nozzles are available with 1/4 NPT and 1/2 NPT connections with BSP adaptors included, and in a variety of sizes and shapes.

Compressed Air Australia Pty Ltd

www.caasafety.com.au

Tetra Pak helps customers meet enriched dairy demand

© iStockphoto.com/hidesy

The demand for personalised products is one of four global product trends pinpointed in an international consumer study commissioned by Tetra Pak and published in its latest Dairy Index.

Dubbed 'Milk 2.0', the label is given to a clearly differentiated product that commands a premium price, serves a niche market and where possible expands the general market.

"For some consumers, less is more, and so manufacturers are offering products without, or with less, fat or lactose, making the nutrition of milk available to people who previously could not digest it," said Charles Vorrath, marketing director, Tetra Pak Oceania.

Italy's leading dairy company, Granarolo, is capitalising on this trend with its lactose-free product range, Accadi.

"Consumers today are looking for products that support a healthy lifestyle," said Tiziano Manco, marketing director, Granarolo. "This is something that has been reflected by the increased demand for our Accadi brand, which features lactose-free milk with vitamin enrichments."

To package its enriched milk, Granarolo selected the Tetra Evero Aseptic, which can now be used for drink categories such as enriched ambient white milk and dairy alternatives, thanks to a new barrier material in the carton top.

The high-density polyethylene package top means the world's first aseptic carton bottle is now available to pack products with oxygen sensitive enrichments.

"Our customers can now expand their offer with the same premium package and brand image, customising products in a range of ways to meet consumer trends," said Charles Vorrath, marketing director, Tetra Pak Oceania.

The carton bottle is suitable for products such as ambient white milk enriched with vitamins, minerals and Omega 3, dairy alternatives such as soy, almond and oat milk, as well as flavoured milk, and toddler and baby milk.

Tetra Evero Aseptic features flat side panels on an otherwise cylindrical carton body, making it easy to hold, along with an injection-moulded plastic top that delivers the pouring quality and convenience of a conventional bottle. The new barrier material top works in existing Tetra Pak A6 filling machines.

Tetra Pak Marketing Pty Ltd
www.tetrapak.com/au

Customised air knife system

Silvent air knives create a broad but narrow flow of air to achieve a pneumatic scraping effect without mechanical contact.

Available from Spray Nozzle Engineering, the Silvent 300 in stainless steel is a highly flexible air knife system that is not limited to any specific lengths; the length of the manifold tube and its number of nozzles can be specifically tailored for nearly any application.

The air knife set-up achieves lower air consumption and noise and higher blowing force. The nozzle thread connection is available in two directions — straight or perpendicular, depending on the nozzle outlet direction. The compact air knife design with high capacity (½″ air supply size) coupled with a compact mounting bracket with full adjustability suits a variety of applications.

Silvent's two-step blowing process enables two separate air streams on the same air knife. The high-quality nozzles will withstand higher wear, especially on the protective ribs. The nozzle outlet holes are evenly positioned along the whole nozzle width, providing a homogenous and uniform blowing pattern on the air knives.

With three standard sizes available, the air knives may be ordered with or without built-in flow regulation. With flow regulation, the blowing force can be fine-tuned to the exact amount of force required, minimising both the noise level and air consumption.

The air knives are made entirely from stainless steel and are suitable for the most demanding applications, such as those involving aggressive chemical environments and high ambient temperatures or the stringent hygienic requirements of the food processing industry.

Spray Nozzle Engineering
www.sprayingsolutions.com.au

Micro-encapsulation system

The Büchi encapsulator is an easy-to-use R&D scale micro-encapsulation system. Micro-encapsulation is used in the food industry to mask taste and off odours; increase shelf life; enhance flavour, texture and quality; and control the release of ingredients.

The encapsulator allows for preparation of both beads and capsules in a wide range of particle sizes (150 μm to 4 mm). There are eight nozzle sizes available, and the system is able to work with a wide range of sample volumes (≥5 mL). The system can operate with viscous solutions due to the temperature control of the nozzle (up to 80°C). The encapsulator includes an application booklet and database to enable rapid obtainment of production parameters. It is easy to optimise by means of visualisation of the production process and real-time control. The system is available from In Vitro Technologies.

In Vitro Technologies Pty Ltd
www.invitro.com.au

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Disc sprayer

The rapidly spinning discs of the Bakon Disc Sprayer apply a thin film of spraying liquid (hot or cold) on the products that pass the spray hood on the conveyor belt. The speeds of the belt and pump are adjustable according to the type of product. The output of product can be set individually by the valves on the hood to keep overspray and loss of product to a minimum.

Key features include: consistent product quality; no spray mist; overspray returned to the container for re-use; adjustable disc flow; and low maintenance. The product is made of stainless steel and easy to clean.

The spray hood holds the operating panel and spinning discs at a fixed speed. The hood is executed with two or more spinning discs (according to the working width) and a back pressure valve.

The speed of the conveyor (standard between 1–6 m/min) makes it possible to spray a variety of products. The optional refrigerated collecting tank is movable and can easily be placed under the disc sprayer.

Bakon bv Food Equipment
www.bakon.com

Scientific CMOS camera with CLHS interface

The pco.edge CLHS sCMOS camera from PCO combines an advanced scientific CMOS technology sensor with a fast Camera Link High Speed interface for high data throughput. The camera's data transmission rates of up to 1.1 GB complement the high data rates of the pco.edge family and it is compatible with the pco.edge 4.2 and 5.5 sCMOS cameras.

Fibre-optic cables overcome the distance limitations of other cable types — with a high degree of flexibility and cost-effectiveness.

Key features include: pco.edge 4.2 (2048 x 2048 pixels) and 5.5 (2560 x 2160 pixels) camera compatible; 1187 MB bandwidth; 100 fps maximum frame rate; peak quantum efficiency (QE) of up to 82% (with pco edge 4.2); extensive FOL cable distance; small form factor; full downloadable CLHS specification; cost effective — use of standard network hardware components allows multisourcing.

The camera is suitable for: live cell microscopy; single molecule detection; lightsheet microscopy; spinning disk confocal microscopy; FRET; FRAP; GSDIM; PALM; STORM; SPIM; SIM; fluorescence spectroscopy; bio- and chemi-luminescence.

SciTech Pty Ltd
www.scitech.com.au

Compact weighing balance

A&D Weighing's EK-EP Series is a compact weighing balance that is suitable for performing precise weight measurement in potentially hazardous environments, or where ignitable concentrations of flammable gases, vapours or liquids are present.

The weighing balance is IECEx compliant, with an intrinsically safe body construction to ensure good explosion protection. It operates on AA alkaline batteries with a battery life of approximately 250 h with the backlight off.

Featuring a compact and lightweight design, and an easy-to-read LCD screen, the device is available in in three capacity models: 300 g x 0.01 g, 3 kg x 0.1 g and 12 kg x 1 g.

Additional features include: multiple weighing mode; percentage mode; counting mode; comparator displays; auto power-off function.

A&D Australasia Pty Ltd

www.andaustralasia.com.au

Hygienic material handling equipment for the dairy industry

Coperion and Coperion K-Tron have developed hygienic material handling equipment for the dairy industry.

The WYK Two-Way Diverter Valve is suitable for inline material handling of powders such as whey powder, lactose, dried milk powders and infant formula. The valve can be used in pneumatic conveying systems in order to divert transfer of the powder to different locations. The fully automatic CIP cleaning design permits complete purging of all product residues after the automatic cleaning process.

The ZRD Hygienic Rotary Valve are USDA and EHEDG approved. The rotary valves can be readily inspected and cleaned, making them suitable for applications involving frequent changeovers and/or for processing products with adhesive tendencies. The rotary valve offers an extra-large inlet for high throughputs and is suitable for pneumatic conveying up at up to 1.5 bar. The sanitary versions of the ZRD rotary valves are used in pneumatic conveying systems and for the discharge of powdered and granular materials. The Coperion K-Tron P-Series receivers provide a sanitary, custom solution for difficult conveying applications. The receivers are constructed of stainless steel, with steep cone angles to ensure good discharge and band clamps for quick disassembly. With the choice of various discharge valve types (powered flap and active driven butterfly valves), the P30 can be used for conveying-only applications such as hopper loading, as well as loss-in-weight feeder refill applications where the receiver is not always emptied completely.

Brolton Group

www.brolton.com.au

Reducing cavitation and seal failure risks

when pumping hot cooking oil

Frying products like potato chips and snack foods etc demands a lot from the system responsible for pumping the hot oil. When fresh products are immersed in hot cooking oil during the frying process, water vapours are released from the product into the oil, changing its consistency and temperature. This temperature and liquid property transition requires the oil to be circulated through the fryer and a heat exchanger.

Obviously, at a temperature of 180°C or more, the cooking oil can't be pumped using a standard centrifugal pump. Safety is a prime concern as any seal failure can result in 180°C-plus oil being let loose.

In addition to sealing issues there are several other technical challenges which need to be resolved in order to guarantee a reliable pump system. As fresh product passes through a fryer, water tends to travel along the bottom of the fryer in a liquid phase at 200°C, until it reaches the pump suction where the action of the impeller breaks up the water into smaller droplets that flash into steam. This entrained steam can impair the pump's head and flow. This presence of steam doesn't just cause damage to the pumps through the possibility of cavitation, the resulting turbulence and vibrations are also detrimental to the pumps' performance.

Firstly, selecting the right pump is of vital importance. A cooking oil pump obviously has to cover the system curve, providing the lowest possible NPSHr (the minimum pressure required at the suction port of the pump to keep the pump from cavitating). This is why in practice cooking oil pumps generally work a little to the left of the best efficiency point (BEP).

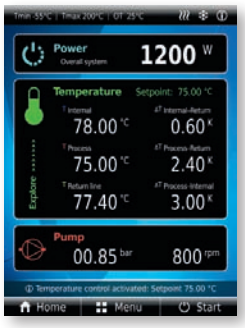
Cornell Pumps has developed several technical innovations that reduce the chance of cavitation or other pump damage to practically zero:

- Anti-cavitation system — here a small amount of oil circulates back to the heart of the impeller through the vapour suppression line. The high-pressure jet into the impeller eye suppresses the vapour bubbles until they have passed through the pump.
- External balance system — this ensures that any build-up of debris around the shaft sealing is transported to the suction side of the pump to prevent damage to the mechanical seal. In addition, Cornell's external balance line equalises pressure between the impeller hub area and the pump suction to reduce axial loading action on the impeller, shaft and bearings.
- 609S 'O' seat mechanical seal — as standard, Cornell uses a shaft sealing which is suitable for cooking oil temperatures of up to 200°C without the need to install external cooling systems.
- For extremely high temperatures there is the option to add a water-cooled mechanical seal that can withstand oil temperatures of up to 288°C.

Cornell Pumps Europe
www.cornellpumpseurope.com

Process technology tool

The E-grade Explore turns a Unistat temperature control unit into a process technology and process engineering development tool, utilising the features of Unistats to display important process and performance data — such as temperature, heating/cooling capacity and pump capacity — directly on the device display. Relevant measurements can also be processed via the digital interfaces.



In addition to targeted process optimisation and process development, the technology enables the estimation of termination criteria, the implementation of use tests and the collection of data for extended process scale-up/scale-down experiments.

Palomo Pty Ltd

www.palomo.com.au

Electric actuator control, monitoring and diagnostics platform

Emerson Process Management has introduced DCMlink software, a unified electric actuator control, monitoring and diagnostics platform.

The DCMlink platform allows users to diagnose, configure and monitor all electric actuators from a central location independent of protocol, actuator or host system. The software extends the useful life of field assets by providing actuator data gathering, condition monitoring, events log and prioritisation of actuator alarms in a unified and consistent user interface. Actuator configuration includes custom characterisation, as well as the ability to import and export historical configuration profiles.

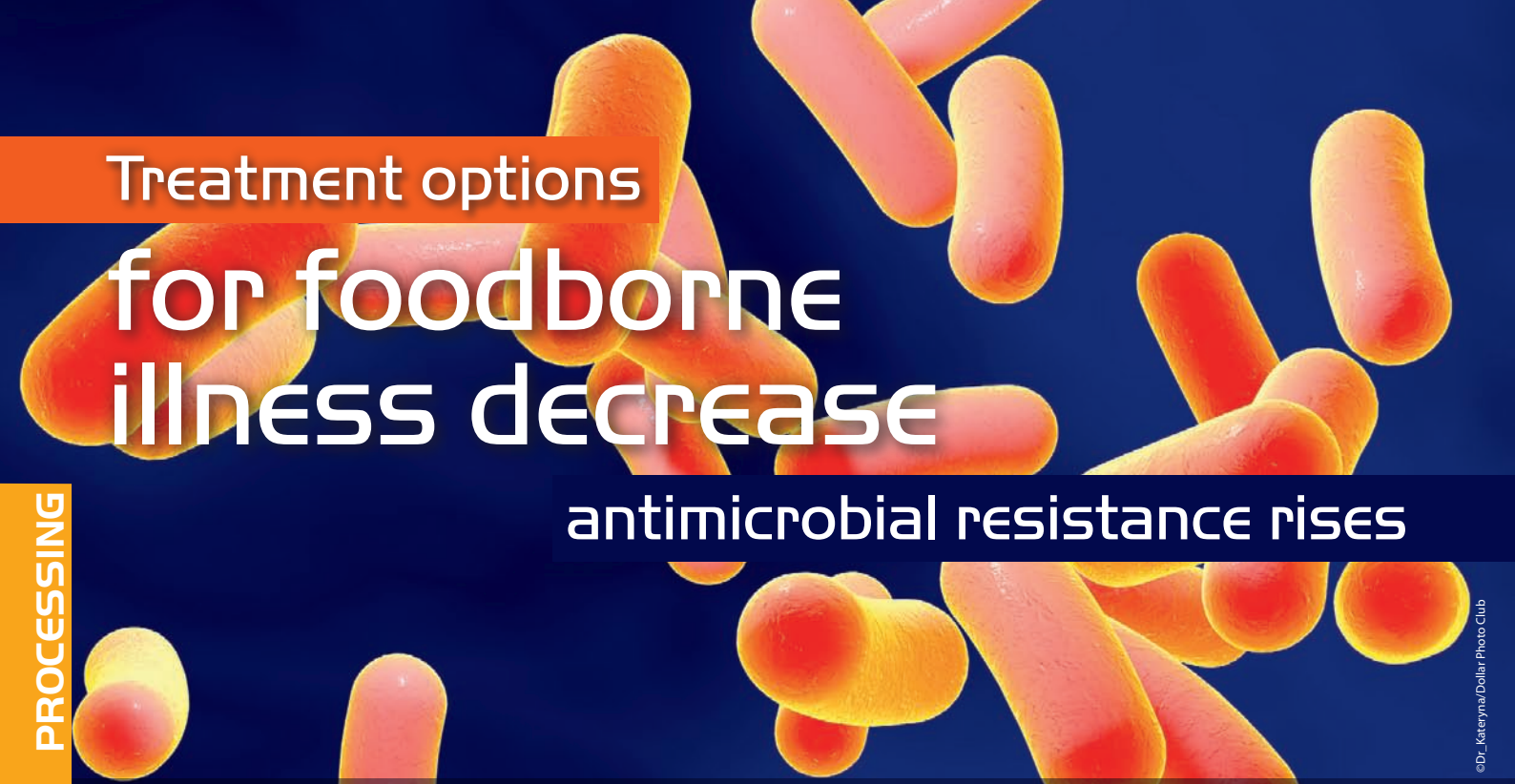
Whether it is viewing value torque profile, live trending data or actionable alarms straight from the actuator, plant operators will be able to access detailed monitoring and diagnostics data, allowing them to take action before a fault occurs. DCMlink offers advanced control and diagnostics, including torque profile curves, initiating partial stroke test or emergency shutdown and alarms in NE-107 format. Current communications support included Modbus, TCP-IP and Bluetooth.

Emerson Process Management Aust P/L

www.emersonprocess.com.au

Treatment options for foodborne illness decrease

antimicrobial resistance rises



©Dr_Kateryna/Dollar Photo Club

About 25,000 people in Europe die every year as a result of infections caused by antimicrobial resistance. As this resistance is a global problem, the numbers of deaths worldwide must be huge. Some of the most worrying increases in antimicrobial resistance are in microorganisms that are involved in foodborne disease — with *Campylobacter* and *Salmonella* standing at the front of the queue.

One of the antibiotics that is causing concern is ciprofloxacin, a second-generation fluoroquinolone with a broad spectrum of activity that is on the World Health Organization's List of Essential Medicines. The drug is frequently used to treat minor infections — in 2002 fluoroquinolones were the most commonly prescribed antibiotic for adults in the US. Sadly, nearly half (42%) of those prescriptions were for conditions not approved by the FDA (and many were for viruses that do not respond to antibiotics).

Resistance to ciprofloxacin and other fluoroquinolones may evolve rapidly and, as a result of its widespread use to treat minor infections, many bacteria have developed resistance to this drug, leaving it significantly less effective than it would have been otherwise. Scientists in Europe are warning that resistance to ciprofloxacin is very high in *Campylobacter*, thus reducing the options for effective treatment of severe foodborne infections.

However, the excessive and inappropriate use of the antibiotic in the healthcare system falls into insignificance when you look at the drug's use in animal husbandry. 80% of all antibiotics sold in the United States are for use on livestock and poultry, and the majority aren't even given to animals that are sick. Instead, it's normal practice in the meat industry to mix these drugs with livestock food and water as a "preventative measure".

The latest annual Europe-wide report by EFSA and the European Centre for Disease Prevention and Control (ECDC) emphasises that antimicrobial resistance poses a serious risk to human and animal health. The report mentions that multidrug-resistant *Salmonella* bacteria continue to spread across Europe and that evidence of resistance to the antimicrobial colistin has been found in *Salmonella* and *E. coli* among poultry in the EU. Mike Catchpole, Chief Scientist for ECDC, said: "This is worrying because it means that this last-resort drug may soon no longer be effective for treating severe human infections with *Salmonella*."

In addition to the high levels of resistance shown throughout Europe, the report found that there are significant regional differences. The highest levels of antimicrobial resistance (AMR) are observed in eastern and southern Europe. Marta Hugas, head of EFSA's Biological Hazards and Contaminants unit, said: "In northern Europe, there is lower resistance in bacteria from poultry, particularly in countries with low use of antimicrobials in animals."

Key findings:

Campylobacter — Campylobacteriosis, the disease caused by *Campylobacter*, is the most commonly reported foodborne disease in the EU. Resistance to widely used antimicrobials, such as ciprofloxacin, was commonly detected in bacteria from humans and poultry. High to extremely high resistance to ciprofloxacin was observed in broilers (69.8%), as well as in bacteria from humans (60.2%). High to extremely high resistance to nalidixic acid and to tetracyclines was reported in broilers.

Salmonella — Salmonellosis is the second most commonly reported foodborne disease. Resistance to widely used antimicrobials was commonly detected in *Salmonella* from humans (tetracyclines 30%, sulphonamides 28.2%, ampicillin 28.2%) and poultry. The prevalence of multidrug resistance was high in bacteria in humans (26%), and especially high in broiler and turkey meat (24.8% and 30.5%, respectively). Some types of *Salmonella* bacteria, namely *Salmonella Kentucky* and *Salmonella Infantis*, are of particular concern as they showed a high level of resistance to ciprofloxacin and high multidrug resistance. The occurrence of extended spectrum beta-lactamase (ESBL) was observed at low levels in *Salmonella* from poultry. However, a clone of multidrug-resistant and ESBL-producing *Salmonella Infantis* was reported in both humans and poultry. Carbapenemase-producing *Salmonella* were not detected in poultry and meat thereof.

Mobile filtration system

Smart Sinks' filtration system removes particulate waste from cleaning water so that the solids can be disposed of in a bin or skip, leaving clean, potable water that can be released to the drainage system.

The latest version is the Smart Sinks Filtration Bin, a fully mobile system suitable for both indoor and outdoor applications. Based on a standard 'wheelie bin', it comes with its own water supply that is recirculated back through the unit. It can also be used in conjunction with a 'wet vac' when cutting concrete or using a hole saw; the wet vac is emptied into the Smart Sinks Filtration Bin and solid waste is separated from the waste water.

The design incorporates three disposable bags, a valve and visual indicators that simplify the use of the system. The filtration bags concentrate the solid material so that the bags from each of the three stages of filtrations can be lifted out and disposed of as standard rubbish. The primary filter collects up to 92% of waste material, with subsequent filters ensuring that all waste is removed.

The system is suitable for use in industries that potentially release pipe blocking solid waste into the environment through waterways, sewerage and drainage systems.

Available models range from a standard 450 mm built-in benchtop unit through to various standalone modules for use in laboratory applications and workplace situations.

Smart Sinks

www.smartsinks.com.au

Creating a model microbrewery

The Steam Whistle Brewery in Toronto, Canada, makes just one type of beer — a bottom-fermented pilsner.

"For our pilsner, we use 100% malt, not adding anything else. It's a mixture of Canadian, German and Czech brewing methods. Light-tasting, not too dark, not too bitter, but still full-bodied," explained brewmaster Marek Mikunda.

Brewery expansion necessitated the installation of a new bottle filler and bottle washer, so Steam Whistle turned to Krones, which had supplied a Volumetic VOC can filler with a Ferrum seamer a few years before.

The set-up has now evolved into a model filling operation for other microbreweries, according to co-founder and president Cam Heaps, with oxygen pick-up at the bottle filler only 17 ppb, and 50 ppb at the can filler. Heaps said the consistency of fill level accuracy has also been significantly improved, and the Lavatec E2 bottle washer runs without a hitch.

For brewmaster Mikunda, filling quality is paramount. "What's crucial in my eyes is not the output but the low oxygen pick-up and the good overall microbiological situation. Our beer is not pasteurised but downstream of the bright-beer tank is ultrafiltered, using deep-bed filtration, arrives at the filler in zero-bacteria condition, and that is how we want things to stay.

"With the two Krones fillers, we can safely assume that even after eight hours of operation they are still in microbiologically flawless condition," Mikunda explained. This is of particular importance, because at Steam Whistle the storage and fermentation area and the filling operation are not topographically separated from each other.

At present, the Modulfill HRS counterpressure filler runs at 12,000 bottles/h, with 18,000 bottles/h being the maximum output settable.

When Mikunda joined Steam Whistle in 2005, production output was 23,000 hectolitres. Since then, it has almost quadrupled, and any expansions have been handled during ongoing operation. The most recent addition was the commissioning of a semiautomatic Steinecker TFS filter, which "runs like clockwork", he said.

JL Lennard Pty Ltd
www.jllennard.com.au

Master data capturing service

©Ivonne Weirink/Dollar Photo Club

SpecPage has released a master data capturing service for food and beverage manufacturing companies to help increase their efficiency in product development and marketing.

The company specialises in the Global Data Synchronisation Network (GDSN) and provides manufacturers and distributors with personalised online catalogues for the user-friendly and efficient publication, distribution and marketing of product information through GDSN. The onboarding service is aimed at companies that do not have sufficient resources to capture master data, adapting them to the increasing regulations and needs of their trade partners.

Auditing services are also available to ensure master data is comprehensive and accurate. Services include the assessment of data fields and evaluation of error protocols from trade partners.

The range of product development solutions includes product lifecycle management (PLM), product data management (PDM), laboratory information management system (LIMS) and environmental health and safety administration (EHSA).

SpecPage
www.specpage.com

Handheld instant Raman analysers

Metrohm Instant Raman Analysers (Mira) are handheld, high-performance spectrometers for rapid, non-destructive analysis of chemical and pharmaceutical samples, either liquid or solid. The spectrometers are the only handheld Raman analysers available with Orbital-Raster-Scan (ORS) technology, a highly reproducible averaging technique which extends the scope of possible samples to any kind of heterogeneous and sensitive materials.

Light and compact, the analysers may be used in the warehouse, in process, in the field and in the laboratory. They give fast and reliable real-time results, with no sample preparation required, and offer close-range measurements through packaging of different thicknesses, including plastic and amber glass.

The analysers, which provide automatic calibration in critical applications, offer comprehensive spectral libraries and are suitable for a wide range of applications - from temperature-sensitive samples to any kind of fluorescent samples.

MEP Instruments Pty Limited
www.mep.net.au

Remote monitoring system for optical sorters

Bühler has released SORTEX AnywarePro, a remote monitoring system that gives customers access to online system data, allowing them to keep track of the performance of their optical sorters via a PC, laptop, tablet or smartphone.

Information such as machine performance, alerts to faults and everyday sorting data can be used to optimise a plant's performance and maximise profitability.

The software collates all the relevant data, such as sorter status, machine performance, fault alerts or component lifetime indicators to aid processors in making plant management decisions. It can highlight potential issues with other parts of the plant — for instance, a sudden increase in foreign material can indicate that other removal machines, such as a destoner, or magnetic separator, are no longer performing efficiently.

Other features include: wear information with Component Lifetime Indicator functionality; sorting statistics and historical data such as defects by date; fault logs and notifications and an audit log.

The traceability and log functions track the sorter performance, level of defects, any changes to the sorter and which operator made them. This audit trail allows the processor to trace back and verify any issues. The Component Lifetime Indicator functionality provides a life expectancy for component parts, giving processors advance notice to order spare parts, while the Remote Assist function enables engineers to provide remote expertise and performance monitoring.

Buhler AG Australia NZ
www.buhlergroup.com

Preventing food waste

better strategy than turning it into biogas

Turning your old banana peels and last night's leftovers into biogas sounds like a win-win situation for you and the environment: you don't have to feel guilty about having cooked too much pasta and the use of biogas reduces CO_2 emissions when it replaces fossil fuels. But a new study from the Norwegian University of Science and Technology (NTNU) shows that it's not that simple.

In fact, encouraging people to work harder to cut food waste instead of collecting food waste and turning it into biogas cuts energy impacts more than biogas production and use, the researchers found.

Of equal importance, cutting food waste also helps cut the use of phosphorus, which is an increasingly scarce but essential plant nutrient that is a key component of fertiliser. This matters because fully one-third of all food produced globally ends up as waste.

"Our work shows that policy and incentives should prioritise food waste prevention and that most savings can be had through a combination of prevention and recycling," said Helen Hamilton, a PhD candidate at the university's Industrial Ecology Programme.

Label confusion

Hamilton and her colleagues at the Industrial Ecology Programme used Norway as a case study to evaluate the costs and benefits of recycling food waste versus preventing it. The group looked at what they called "avoidable food waste", or food that should have been eaten but for different reasons ends up as waste. The term does not include unavoidable food waste, such as bones, shells, peels and residues, like coffee grounds.

When they looked across the board at different segments of the food production and consumption sector, they found that 17% of all food that had been sold was wasted. Most of that waste was at the consumer level, partly because of the confusion caused by labelling, the researchers wrote in an article in *Environmental Science and Technology*.

The problem is the difference between labels that describe a product's 'best before' date compared to a product's 'use by date'.

"Consumers often mistake use by dates, which refer to highly perishable goods that pose a risk to human health if consumed after a certain period, with 'best before dates', which merely indicate a food's reduction in quality but not safety," Hamilton and her colleagues wrote. "This results in a substantial amount of food waste at the household level."

Phosphorus, the overlooked nutrient

Hamilton and her colleagues also looked at how food waste affected phosphorus use in the agriculture sector.

Most people don't realise that phosphorus, which mainly comes from phosphate rock, is a limited resource that is primarily concentrated in geopolitically unstable regions including Morocco and the Western Sahara. It is an element, so it can't be created. It is also absolutely necessary for food production, and it has no substitute.

A 2010 PhD dissertation from Linkoping University in Sweden found that the growth in the global population combined with food demand will result in an increase in phosphorus demand by 50–100% by 2050.

When Hamilton and her colleagues compared what happens to phosphorus demands if avoidable food waste is prevented versus recycled, they found that Norway's need to import mineral phosphorus declined by 14%. The need to import phosphorus also decreased compared to the baseline demands by 6% under the food waste recycling scenario, but that is a theoretical maximum and would only be true

Image: Helen Hamilton is a PhD candidate at the Norwegian University of Science and Technology's Industrial Ecology Programme. Image credit: NTNU.

if the leftovers from biogas processing could be perfectly returned to agricultural soils as fertiliser, which is currently not the practice today, Hamilton said.

"This assumption in no way reflects a probable future, as only minimal amounts of residuals produced today are returned to agricultural soils due to many factors," she said, one of which is that farmers are not that eager to accept biogas residuals as a suitable substitute for mineral phosphorus.

Biogas is good, but preventing food waste is better

Some of Norway's major cities — Oslo, in particular, but also smaller cities like Tromsoe — collect food waste in separate green bags that can be sorted from the waste stream using optical sorting. While Tromsoe currently composts its waste, Oslo has its own biogas facility that relies in part on food waste collected in the city.

Some of the biogas that is generated by Oslo is used in 36 buses fitted out to burn biogas, which led the Oslo bus company, Ruter, to proclaim in October 2013 that "now buses are fuelled by your banana peels".

While that sounds like a good thing — it does, in fact, reduce the need for fossil fuels — in sum, it takes more energy to collect the food waste and process it than it would if people didn't throw away so much potentially edible food unnecessarily, Hamilton and her colleagues found.

Reducing the demand for animal and plant products (by wasting less), results in "both reduced upstream production impacts and downstream waste treatment impacts", the authors wrote.

> *"Consumers often mistake use by dates, which refer to highly perishable goods that pose a risk to human health if consumed after a certain period, with 'best before dates', which merely indicate a food's reduction in quality but not safety."*

Why the emphasis on recycling?

Given the obvious costs of collecting food waste and building biogas plants, why isn't there a more concerted effort to reduce food waste in Norway?

Hamilton says there are two reasons behind this lack. The first, she says, is that while there are some efforts in Norway to cut food waste, there are no clear goals or targets at the national level. That reduces the imperative to promote cutting food waste.

The second reason is far more subtle, and built into the very fabric of our society, she says.

"Our current society is shaped to favour the throughput of material, with the production of marketable goods, like food and biogas, providing profitability for businesses," she and her co-authors wrote. "Because of this, there is a 'clear temptation' to incentivise and prioritise the use of food waste for energy recycling over food waste prevention."

Targets focus funding

The fallout from these two factors is clear in Norwegian government spending, she says. For example, Norway has a biogas strategy with targets. Thus, in the 2015 Norwegian state budget, lawmakers allocated NOK10 million (about USD1.1 million) to biogas pilot projects and research, as a way to help reach these targets.

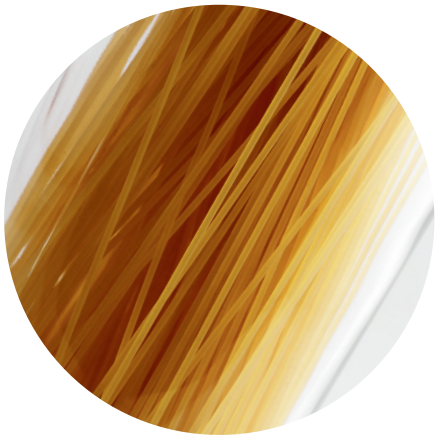
While these projects are not completely dependent on food waste for their raw material, two Norwegian biogas facilities have been opened over the past three years that are specifically for organic/food waste, with a capacity to process 70,000 tons of waste per year. Government support for the two facilities has topped NOK9.3 million, while the country's largest food waste prevention effort, called ForMat, was allocated just NOK700,000.

Hamilton and her co-authors say one reason for this mismatch may be that policymakers have too narrow of a focus on solving an 'end-of-pipe' problem — food waste.

"If one only analyses methods for handling wastes (end of pipe), without regards to upstream impacts, results will often reflect the benefit of producing secondary value-added goods, such as biofuels," the researchers wrote. "With narrow system boundaries, even policies meant to increase sustainability get skewed."

Another risk of prioritising recycling is that there is a risk of getting locked into 'needing' waste to run the biogas facilities, Hamilton said.

"It is important that we address these issues now because there's a risk," she said. "If we prioritise food waste recycling and build up facilities for producing biogas, we risk locking ourselves into needing waste. That is clearly not part of a sustainable future."



Texture analyser for spaghetti and noodle testing

Lloyd Instruments has launched a test fixture designed to meet the quality assessment requirements of spaghetti, pasta and noodles producers. The Spaghetti and Noodle Compression attachment fits the TA1 texture analyser and other machines in the company's range. It is designed to measure the thickness of cooked spaghetti, pasta and noodles to calculate parameters such as sample compressibility, recovery and springiness, and find the ideal cooking time to ensure an 'al dente' product.

The accuracy and ease of use makes the test system suitable for R&D and quality control during food production. A cooked product sample is placed onto the fixture's lower compression plate; the machine then lowers the upper compression plate via a high-resolution encoder and takes three thickness measurements at two specified loads of 15 gf and 515 gf. Results are stored and analysed in the NEXYGENPlus materials testing software. Additional results are calculated from these three thickness measurements to evaluate sample compressibility and other parameters.

Besides compressibility, the system evaluates product recovery and springiness, and helps manufacturers calculate ideal cooking times, assess ingredients mixes, understand product behaviour after freezing and keep production costs low.

The texture analyser has a large work area and 10 programmable test set-ups. It operates a data sampling rate of 8 kHz and can save up to 600 test results.

Bestech Australia Pty Ltd
www.bestech.com.au

Single-use transport data loggers

VWR International has available Ebro Single Use EBI 330 data loggers for monitoring the temperature of food and other temperature-critical products during the transportation process.

The single-use data loggers EBI 330-T30 (-30°C to +60°C) and EBI 330-T85 (-85°C to +50°C) are an extension to the EBI 300 family. The data loggers, incorporating USB plug and automatic PDF generation, enable temperature control and documentation in the food industry according to EN 12830 as well as the transport monitoring of medicine, blood plasma and other pharmaceutical products. The loggers are suitable for situations where return of multi-use loggers to the sender is either difficult or impractical because of effort and cost.

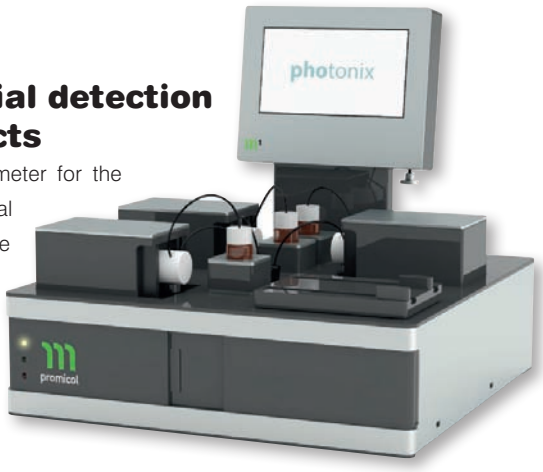
The data loggers can be ordered preconfigured or can be configured by the user. The push of a button starts the logger at the place of departure and the product will measure until the memory is full or until the data logger is connected to the USB port of a PC at the destination. The data loggers generate a PDF report with all important measurement data without the need for additional software.

The 80 x 28 x 12 mm data loggers save up to 6000 measurement values and can be used for up to 100 days. The loggers have flexible configuration options, including sample rate, alarm limits, language and measuring units. A red flashing LED shows the exceeding of the limit.

The devices are waterproof (IP65) and come with a robust housing to withstand most harsh conditions. A batch calibration certificate is available on demand.

VWR International Pty Ltd
au.vwr.com

Instrument for microbial detection in UHT and ESL products



The Promilite M1 is a compact luminometer for the testing of sterile, ESL and low microbial load products. The M1 is able to reduce product release time from a week or more, down to 1–3 days. The luminometer works on the principle of microbial ATP detection and is applicable to products where there would typically be no microbial presence, such as UHT milk and ESL juice.

The M1 makes rapid testing accessible, as previously much larger and more expensive instrumentation was required, meaning the technology could only be used where large quantities of samples were being tested. The M1 is suitable for users who are doing as few as 10 tests per day.

Apart from milk and juice, other applications for microbial ATP detection include soups, stocks, desserts, soy milk, nut milk, wine, cosmetics, toiletries and biomass.

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Next-day *Cronobacter* test

Cronobacter, also known as ***Enterobacter***, is an opportunistic pathogenic bacteria responsible for foodborne illness. ***Cronobacter*** is able to survive in desiccated states for extended periods of time, which means that it can be a problem in powdered dairy products.

As ***Cronobacter*** is known to cause severe complications in infants, such as sepsis, enterocolitis and meningitis, it is important to screen for this organism in infant formulas. Traditional methods for detection include culturing, which can take 3–5 days and involves multiple steps and a high degree of expertise.

The Assurance GDS (Genetic Detection System) offers a ***Cronobacter*** species result in 26 h for infant formula, powdered milk and environmental samples. The GDS is a highly sensitive, highly specific PCR platform for pathogen screening. The method for ***Cronobacter*** is a simple one-step enrichment, followed by amplification and detection in the thermal cycler. The system is suitable for use in most processing plants and laboratories.

Australasian Medical & Scientific Ltd
www.amsl.com.au

Online analysis for soybean meal

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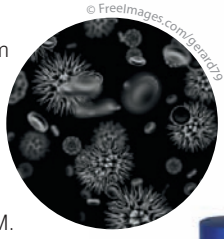
AusScan Online has added eight new parameters to its Total and Standard ileal digestible (SID) amino acid product for soyabean meal analysis. AusScan uses near infrared spectroscopy (NIR) to scan grains and upload spectra files to its online platform, to allow rapid determination of in vivo energy values of the grain. Standard ileal digestible values for methionine, cysteine, threonine, isoleucine, leucine, phenylalanine, tryptophan and histidine are now available through the website.

Aunir
www.aunir.com

High-resolution microscope



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The NanoWizard 4 BioScience Atomic Force Microscope from JPK Instruments allows users to follow dynamic processes with good resolution though a flexible design. The system is suitable for integration with advanced optical methods such as FLIM, FCS, FRET, Confocal, Raman as well as with SuperResolution optics such as SIM, STED or PALM/STORM. This enables straightforward high-resolution quantitative imaging through a nanomechanical design of the core AFM complemented with a range of modes and accessories. The improved QI mode delivers quantitative imaging with high resolution for single molecules, live cells or tissues.

Benefits include: observe sample dynamics in real time; fast scanning up to 70 Hz line rate; enhance productivity, probe more sample positions; time lapse studies on molecules or cells; capture living cells in a well-defined state; correlate all data with optical microscopy.

SciTech Pty Ltd
www.scitech.com.au

Hygiene monitoring system

Neogen Corporation has released the AccuPoint Advanced Hygiene Monitoring System.

Adenosine triphosphate (ATP) sanitation monitoring systems are an easy and quick measure of a facility's cleanliness and are easily customised for the specific equipment, people, product and processes used in any food production facility. The system enables users to set an objective, recordable and traceable standard to help avoid the consequences of substandard cleaning efforts.

The hygiene monitoring system is an update to the AccuPoint ATP System and includes updated samplers, a simple and accurate reader and new Data Manager software to effectively detect ATP from food residues and microorganisms present on surfaces and in liquids.

The robust handheld reader can be used to test virtually anywhere and produces results in less than 20 s. In addition, the system incorporates Data Manager software, which allows the user to create test plans to track, analyse and trend test results over time.

Cell Biosciences Pty Ltd
www.cellbiosciences.com.au

Non-contact colour measurement of foods

The HunterLab D25 NC colour measurement system has been specifically designed to measure the colour of large, irregularly shaped products such as snack foods, biscuits, lollies, chocolates, cereals, beans, seeds and nuts. It easily manages granules and powders of all sizes, as well as opaque liquids and pastes. The product provides accurate colour measurement with ease of use.

By integrating a non-contact sensor and a rotating sample dish in one stand-alone instrument, the product enables rapid sampling (five flashes per second, 25 times per cycle); full cycle averaging for a large measured sample area of 129 cm^2 per cycle; and easy sample preparation. The easy-to-read colour display provides a simple built-in user interface. The unit features stand-alone operation; a compact design; low power consumption; long-life LED illumination; USB connectivity; and internal storage of up to 250 different set-ups and 2000 sample measurements

The intelligent integrated height sensor enables accurate product height measurement, consistent colour measurement independent of height variation and measurement of the sample only and not the dish.

Novasys Group Pty Ltd
www.novasys.com.au

Is your hand cleaning protocol as good as it gets?

Ensuring hands are clean is not as straightforward as you may think. The World Health Organization (WHO) recommends a six-step hand-hygiene technique while a three-step procedure is preferred by the US Centers for Disease Control and Prevention (CDC). Is one protocol better? If so, which one?

The answer has been published in *Infection Control & Hospital Epidemiology*, the journal of the Society for Healthcare Epidemiology of America.

Jacqui Reilly, professor of infection prevention and control at Glasgow Caledonian University in Scotland, led a study which compared WHO's six-step hand hygiene process with CDC's three-step system.

And the result was clear: the six-step hand-hygiene technique recommended by the WHO is superior to the CDC's three-step method in reducing bacteria on healthcare workers' hands.

During the randomised controlled trial in an urban, acute-care teaching hospital, researchers observed 42 physicians and 78 nurses completing handwashing using an alcohol-based hand rub after delivering patient care. The six-step technique was determined to be microbiologically more effective for reducing the median bacterial count (3.28 to 2.58) compared to the three-step method (3.08 to 2.88). However, using the six-step method required 25% more time to complete (42.50 seconds vs 35 seconds).

"Hand hygiene is regarded as the most important intervention to reduce healthcare-associated infections, but there is limited evidence on which technique is most effective," said Reilly, PhD, lead author of the study. "This study provides a foundation for effective best practices to implement on the frontlines of healthcare."

"One of the interesting incidental findings was that compliance with the six-step technique was lacking. Only 65% of providers completed the entire hand hygiene process despite participants having instructions on the technique in front of them and having their technique observed. This warrants further investigation for this particular technique and how compliance rates can be improved," said Reilly.

The researchers recommend authors of international guidance should consider this evidence when making official recommendations on best practices in hand hygiene.

Now, the healthcare environment may sound a long way from food preparation facilities, but in both situations hand hygiene is critical. Perhaps it's time review the 'quick dunk and cursory wipe on a dodgy towel' protocol that is being followed in your facility.

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