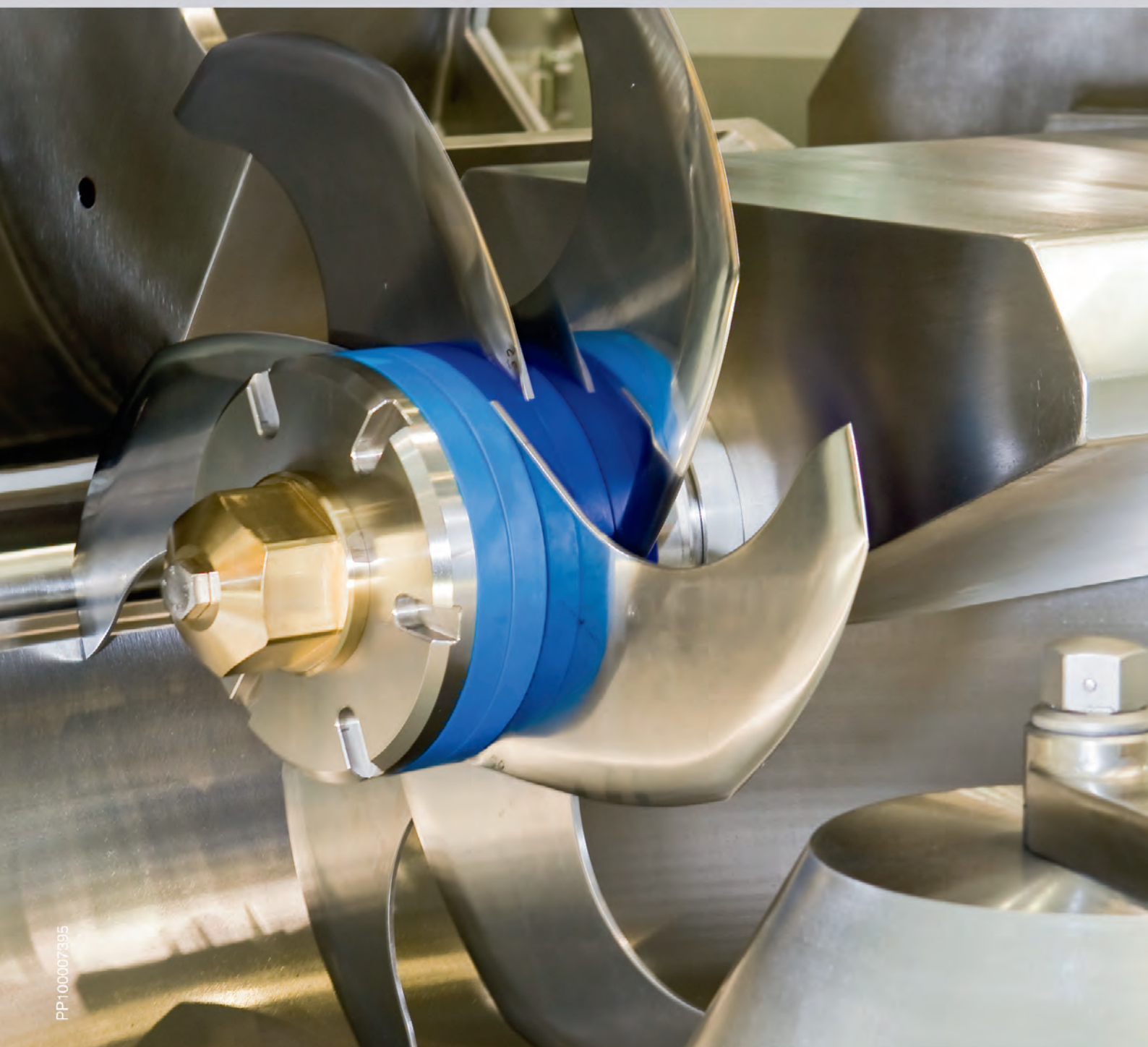


May/June 2015  
Vol.23 No.1

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



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**Ready meals**

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# How smart is your factory?

Managing the extreme complexity of real-time process control is one of the biggest challenges facing manufacturers today.



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Last year, Ubisense surveyed 252 manufacturing engineers, product designers and quality management professionals in its 2014 Smart Manufacturing Technologies Survey and uncovered some surprising results. The survey revealed that lack of visibility into manufacturing processes is the most prevalent issue plaguing manufacturers today. It seems that 40% of manufacturers have no visibility into the real-time status of their manufacturing processes.

Visibility is crucial for process improvement and control, but its value is far more fundamental. According to responses from the survey, nearly 10% of factories spend half their day simply looking for equipment and products. This non-value-added time can result in significant wastage. For example, a few minutes spent finding each vehicle in a heavy vehicle plant can accumulate to several hundred thousand dollars in lost inventory costs annually.

Industry 4.0, also known as the Internet of Things (IoT), introduces cyber-physical systems in which machines communicate with each other and their users, digitally and in real time, and factory processes become visible and controllable in virtual space.

In this revolution, legions of networked sensors connect to intelligent data analytics in the cloud to create cyber-physical systems capable of sophisticated real-time decision-making. Supply chains can automatically adjust based on changes in demand or production capacity, and products can communicate to machines about how they should be processed.

The manufacturing world may be talking about Industry 4.0, but Ubisense's survey shows that most manufacturers are far from embracing the cyber-physical systems which define the 4th Industrial Revolution. In fact, most factories have yet to embrace Industry 3.0, the automation age.

Eighty per cent of survey respondents said they rely on team observations to support process improvement initiatives. This means the majority of manufacturers rely on subjective, rather than objective, data when making changes to their manufacturing processes.

In fact, only 16% of respondents indicated that they rely on sensors that measure process flow and provide objective data.

This lack of data may be a contributing factor in the challenge to optimise production. The lack of flow optimisation is evident when 54% of respondents reported that up to 10% of cycle time per product is non-value-added process waste.

Furthermore, in operations where products may run through a repair or rework process, the survey revealed that almost 15% of manufacturers don't prioritise product repairs at all. The repair process is one which typically receives far less technology investment than the primary manufacturing process but can be a source of significant waste.

Manufacturers need to focus on automating their systems and gaining a more valuable, objective level of visibility so they can better optimise their workflow and reduce errors in their processes.

## Additional survey findings

- While 40% have no visibility into the real-time status of their company's manufacturing process, 30% of manufacturers do have access to instant, real-time status of every product.
- 56% of manufacturers are using the limited visibility data they have to identify problems as they occur, meaning that over half of respondents only know about crises after they happen.
- 40% of manufacturers are leveraging their visibility data to try to identify problems before they occur. In these situations, frontline managers can be much more proactive by identifying a pending stoppage and making adjustments in advance to maintain flow.

Now this survey did not involve the food manufacturing sector - rather, Ubisense operates in the vehicle and industrial manufacturing arena where its 'Smart Factory' uses real-time location data and other owned data from manufacturing and enterprise systems to give manufacturers process visibility. However, one does end up with the sneaking supposition that for many the smart food factory is still a long way in the future and that there is still a lot of automation possible in the interim.



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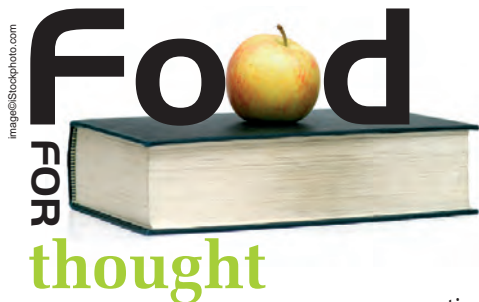


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## Calorie count labels only work for wealthier consumers, study finds

Consumers actually do make decisions based on calorie counts on fast food menus - but only if they're wealthy and well educated. Researchers have found that consumers with higher incomes and education levels are twice as likely to notice calorie labels and three times more likely to use them than consumers who earn less and have lower levels of education.

"Studies show consumers and nutritionists alike have trouble estimating the calorie and nutrient content of a restaurant meal," said Punam Ohri-Bachaspati, a nutrition researcher at the School of Nutrition and Health Promotion at Arizona State University. "Because fast food is a popular choice among Americans, we wanted to see how effective menu labelling was and if it helped customers make healthier choices. What we found, however, was that while the majority of customers noticed the labels, a very small percentage reported using them to influence their purchasing decisions, and customers with lower income and lower education levels reported using menu labels to a much lesser extent."

While approximately 60% of consumers notice the calorie menu labels, only 16% reported using the labels to guide their food and beverage choices, the study found.

"Once menu labelling is implemented, the fast food industry and public health community must work together to make it easier for consumers from all income and education backgrounds to understand and use this information. We need effective ways to get those who only notice the information to start using it," Ohri-Vachaspati said.

She also suggests educating school children on using menu labelling to help them become informed and health-focused consumers.

The study, which has been published in the *Journal of the Academy of Nutrition and Dietetics*, is the first study of its kind specifically designed to examine the likelihood of customers noticing and using calorie menu labels in fast food restaurants in a mixed income and racially diverse sample of adults.



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## Pulsed electric fields - a viable alternative to pasteurisation

Controlling pathogen growth in milk by means of refrigeration simply isn't feasible in some low-income countries due to the high cost of infrastructure and the lack of a permanent electricity supply. In addition, pathogens like *Listeria* are less sensitive to low temperature and can proliferate even when milk is refrigerated.

"There is a constant search for new, low-cost, chemical-free technologies for milk preservation, especially for the small farmers in the low-income countries," said Alexander Golberg, PhD of Porter School at Tel Aviv University.

Golberg and colleagues have developed a technique using high-voltage, short pulsed electric fields that selectively damage cell membranes, killing the contaminating bacteria by a process known as electroporation.

"In many rural places refrigeration is not possible and its alternative, lactoperoxidase system may be misused to disguise milk produced under poor hygienic

conditions as Codex Alimentarius. This development not only holds great promise for unravelling many aspects of the complex wound healing process but can also potentially lead to new therapies. We believe that this model will enable other laboratories to learn and uncover new aspects of adult tissue growth and development." An emerging technology in the food industry, pulsed electric fields has been shown in multiple studies to effectively kill multiple foodborne microorganisms. It could provide an alternative, non-thermal pasteurisation process in areas where large-scale pasteurisation facilities don't exist.

"In the storage application, developed in this work, we use the fundamentally different approach for microorganism control. Refrigeration, the major milk preservation technology, slows the bacteria metabolism; pulsed electric fields kill them," Golberg said.

"Moreover, our model shows that pulsed electric fields preservation technology does not require a constant electricity supply and can be powered 5.5 hours a day using small, family-scale solar panels. I believe that this technology can provide a robust, simple and energy-efficient milk preservation system that would decrease the wasted milk thus increasing the income of the small farmers in developing countries."

The study was published in the journal *TECHNOLOGY*.



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## AIFST 2015 conference to be biggest yet

This year's 48th Annual AIFST Convention will be bigger than ever - two conferences in the one place - as it will be joined by the Australian Food Microbiology Conference at Sydney's Luna Park. The three-day double conference to be held from 11-13 August is expected to be the year's biggest food industry event in the Asia-Pacific.

With the theme 'Food for All', keynote speakers, workshops and roundtable discussions will focus on the big ideas and latest thinking around Australia's role in catering for global food supplies.

Linda Harris from the University of California's Department of Food Science and Technology is confirmed as a keynote speaker, a specialist in food safety microbiology who will look into global food safety and provide insight into how to avoid disease outbreaks.

Also for the first time, the AIFST convention will be holding a Food Entrepreneur Business Essentials workshop, a one-day navigation through the essentials of developing a sustainable food business, hosted by successful food practitioners. The workshop will be held under the Luna Park Big Top Foyer 2 from 8.50 am on 12 August for registered participants.

For more information on the colocated event or to register, visit [www.aifst.asn.au/convention.htm](http://www.aifst.asn.au/convention.htm).



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## Low-fat recommendations not based on good science, meta-analysis shows

The low-fat craze of the late 20th century never would have happened if correct scientific protocol had been followed, according to a paper in the online journal *Open Heart*.

National dietary advice to cut fat consumption to reduce coronary heart disease "should never have been introduced" as it lacked any solid trial evidence to back it up, the authors of the paper say.

Dietary guidelines issued to millions of US and UK citizens in 1977 and 1983 recommended cutting overall dietary fat consumption to 30% of total energy intake and saturated fat to 10% of total energy intake.

However, the paper authors carried out a systematic review and meta-analysis of the randomised control trial data that would have been available to the US and UK regulatory committees at the time and found no evidence to support the dietary recommendation.

"The results of the present meta-analysis support the hypothesis that the available [randomised controlled trials] did not support the introduction of dietary fat recommendations in order to reduce [coronary heart disease] risk or related mortality," the researchers wrote.

"Dietary advice not merely needs review; it should not have been introduced."

They found that the trials showed little or no significant difference between 'treatment' (ie, reduced fat consumption) and comparison groups in studies examining the relationship between dietary fat, serum cholesterol and the development of coronary heart disease.

In fact, reductions in serum cholesterol noted in treatment groups did not seem to have any impact on the death rates from coronary heart disease - or indeed from all causes.

The six trials examined had several limitations: no women were included in the trials, no trial tested the dietary recommendations and no trial concluded that dietary guidelines should be drawn up.

"It seems incomprehensible that dietary advice was introduced for 220 million Americans and 56 million UK citizens, given the contrary results from a small number of unhealthy men," the researchers wrote.

However, Rahul Bahl, of the Royal Berkshire NHS Foundation Trust, said that just because the evidence was "very limited", it does not follow that the risk factor identified is not a true risk factor as epidemiological and ecological evidence suggests a link between dietary fat and heart disease.

In addition, public policies generally don't require randomised controlled trial evidence, Bahl said.

"There is certainly a strong argument that an over-reliance in public health on saturated fat as the main dietary villain for cardiovascular disease has distracted from the risks posed by other nutrients, such as carbohydrates," he wrote.

"Yet replacing one caricature with another does not feel like a solution."

# Food

FOR  
thought



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## Farm to fork business strategies at Agriworld 2015

Exponential growth in affluence of the middle classes in Asia, regional population growth and new trade agreements with China, Japan and Korea offer Australia's agribusiness sector the potential to increase its agricultural and food-based exports by more than 45% over the next few years.

But to achieve this growth, the industry must overcome substantial production, processing and supply challenges from international markets, as well as understand how emerging innovations and technologies and improved business strategy can enhance farm production, food processing and the broader Australian agrifood supply chain. Agriworld Australia 2015 aims to provide technologists, manufacturers, buyers and investors from the agribusiness sector with a face-to-face business forum to improve their farm-to-fork efficiency and a program focused on fostering future food manufacturing and export opportunities in the Asia-Pacific region.

The conference and exhibition will be held from 16-17 July at the Sydney Showground at Sydney Olympic Park.

"Agriworld will deliver the sector the platform required to take advantage of business opportunities throughout the Asia-Pacific region, address production challenges and maximise value at all stages of the supply chain," said Anthony Reed, event director of Agriworld Australia.



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Structured around four pillars - Agriinvest, Agritech, Agrinext and Agritrade - which directly correlate to key segments of the agriculture and agribusiness industries, the forum will consist of various educational, knowledge-sharing and networking opportunities targeted at generating improvement in Australian agriculturalists' business performance.

Keynote speakers include the Shadow Minister for Agriculture MP Joel Fitzgibbon, CEO of the Laguna Bay Pastoral Company Tim McGavin and Science Director of the Agriculture Flagship CSIRO Dr Brian Keating. The Royal Agricultural Society of New South Wales will also act as host for the two-day event. For more information about Agriworld Australia 2015, visit [www.agriworldaustralia.com.au/](http://www.agriworldaustralia.com.au/).

## Wiley to upgrade GrainCorp's oils and spreads plant

Wiley has been selected to expand and upgrade GrainCorp Foods' West Footscray plant. The upgraded facility will give the company extra capability, including retail spreads, bakery fats and shortenings.

GrainCorp has launched the project as part of a wider initiative by GrainCorp Oils to integrate its edible oils and spreads manufacturing operations. The initiative will increase overall competitiveness and reduce carbon emissions by around 25,000 tonnes each year. GrainCorp Foods will relocate its processing and packing operation from Murrarie, Queensland, to the Footscray site. GrainCorp Oilseeds' operations in Numurkah, Victoria, will also be relocated to the Footscray site. These operations will also be expanded and upgraded to accommodate the additional capacity.

These changes will reduce the trucking distance of the final product by 550,000 kilometres each year to customers based in Melbourne and Sydney.

"GrainCorp's West Footscray upgrade is a vital piece of the wider integration project, which will significantly reduce operational costs and boost the competitiveness of locally produced food and food ingredients against imported products," said Wiley Managing Director Tom Wiley.

"A major outcome of the project will be improving environmental performance by reducing carbon emissions by around 25,000 tonnes per year, thanks to the disuse of coal-fired equipment currently used to generate steam at the Murrarie plant," added Wiley Business Operations Director Simon Spittle.

"GrainCorp's investment in its West Footscray and Numurkah sites will eliminate the need for the coal-fired equipment, providing GrainCorp with the opportunity to invest in more efficient and environmentally sustainable technology."

L-R: Frank Koot, BECA; David Burton Bradley, Wiley; Ian Gahan, Wiley; Brendan Barfoot, Wiley; Trevor Somerville, Wiley; Josh Jeffrey, GrainCorp.





The background of the advertisement features a large industrial pressure cooker with several stainless steel pots inside, each containing a mixture of orange and white ingredients. In the foreground, various Fluke industrial measurement tools are displayed. On the left is a large grey Fluke 9000 series power analyzer. Next to it is a yellow Fluke 3000 series multimeter showing 300.0 V~. In the center is a white Fluke 9000 series pressure transducer. To its right is a yellow Fluke 7100 series pressure gauge showing 15000 PSI. Further right are two yellow Fluke 720 series pressure transducers, one showing 71.980 PSI and the other 7.21 PSI. At the bottom right is a large grey Fluke 9000 series data logger showing a list of data points on its screen. The Fluke logo is in the top right corner.

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# Food FOR thought



## Energy Efficient Loans boost productivity for manufacturing, agriculture

A \$100 million loan program is helping Australian businesses accelerate projects to boost their energy productivity.

The Energy Efficient Loan program, a joint initiative from the Commonwealth Bank and Clean Energy Finance Corporation (CEFC), is financing technologies that reduce energy costs.

CEFC CEO Oliver Yates said that the program had already financed \$20 million in projects from the agriculture and manufacturing sectors. He said the typical projects the CEFC is financing would see agribusinesses expecting to halve their on-grid electricity or gas consumption by switching to on-site generation and manufacturers upgrading equipment to lower their energy costs by up to 30%.

"We're experiencing growing interest in Energy Efficient Loans and even seeing some businesses, after experiencing the positive results, look to financing additional upgrades to improve the efficiency of their operations even further," he said.

Recent Energy Efficient Loan participants include:

- Goulburn Valley-based fruit supplier Radevski Coolstores undertook a refrigeration upgrade financed by an Energy Efficient Loan in 2013. Radevski Coolstores has been granted \$4.2 million in new finance to install a state-of-the-art fruit grader and solar PV, to cut its overall energy costs by a quarter.
- Wangaratta-based fresh produce supplier Nu Fruit is installing 100 kW of solar PV to generate more than 10% of its own energy, reducing its grid electricity needs. The supermarket supplier is accessing \$220,000 from the Energy Efficient Loan program.

The program has also assisted with the installation of a gas-fired trigeneration plant for a major meat processing and rendering business, new ovens for a plastic manufacturer, a refrigeration upgrade for an apple and chestnut grower and new printing presses for a major labelling company.

The program's pipeline includes proposals for purpose-built equipment upgrades for manufacturers and the installation of solar for a major specialist retailer.



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## AIFST appoints first CEO

Georgie Aley has been appointed as the first chief executive officer of the Australian Institute of Food Science and Technology (AIFST). The appointment is effective as of 1 April 2015.

In the newly created role, Aley will strategically drive AIFST's promotion and support of Australian food industry professionals, and their contribution to both the local and global markets.

Aley is currently the managing director of the Grains & Legumes Nutrition Council (GLNC) and non-executive director of Pulse Australia Limited, Future Farmers Network Limited and Workforce Consulting. She was named in the 100 Women of Influence in 2014 and was honoured in the Women in Australian Agribusiness 100 list.

"I believe it's an exciting time for the Australian food and agribusiness sector. As a key economic pillar for Australia and a growing community interest in food, we have a terrific opportunity to drive real outcomes for our industry," said Aley.



*Newly appointed  
AIFST CEO  
Georgie Aley.*

*Australian Institute of Food  
Science and Technology (AIFST)*

## CPP recognised as gold standard in packaging proficiency

The Certified Packaging Professional (CPP) designation is set to become the must-have achievement for packaging professionals, thanks to a new partnership announced by the Institute of Packaging Professionals (IoPP) and the Australian Institute of Packaging (AIP).

The two organisations have agreed to mutually recognise CPP as the gold standard of packaging proficiency under a program that will see AIP members join qualifying IoPP members as being eligible for certification. Under the AIP-IoPP partnership, members in good standing of either AIP or IoPP (at the Premium or Elite member levels) are eligible for the certification program. The program requires that the candidate pass a 150-question online multiple-choice exam. They must also complete other qualifications, such as providing a Resumé of Activities which enables them to demonstrate their industry expertise in multiple dimensions, subject to a review panel put together by IoPP and AIP.

For complete details and requirements of the CPP program, email [educate@aipack.com.au](mailto:educate@aipack.com.au).



# bulk handling storage & logistics





# Robotic harvesting of chicken breasts

## Getting more food from raw materials

Christina Benjaminsen

**Can an industrial robot succeed at removing the breast fillet from a chicken and, at the same time, get more out of the raw materials?**

**N**orwegian researchers working on the CYCLE project\* have built Gribbot, a fully functional robot that automates the process of extracting breast fillets from chickens - a task that normally requires skilled human hands.

### Sharp-eyed robot with nimble fingers

Ekrem Misimi, a technical cyberneticist with a doctoral degree in machine vision, has specialised in providing robots with sharp, three-dimensional vision - which in this case means eyes for the anatomy of a chicken.

"Automating this process is something that no one else in the world has succeeded in doing before. Except us," said Misimi proudly.

"So far, one of our results is the robot Gribbot, named because of its resemblance to a vulture's beak ('gribb' is the Norwegian word for vulture).

"Gribbot is well equipped. It has a hand for grasping, specially developed 'fingers' and three-dimensional vision. Its 'eyes' have been borrowed from a 3D camera familiar to all games fans - the Microsoft Kinect 2.

"These are all needed because a chicken fillet is a delicate object that must be handled extremely carefully. The robotic hand must not spoil it with marks or other quality defects. Both the robot's vision and its grasping hand are critical factors."

### Smooth and shiny

"Generally speaking, it's a major challenge to get a robot to process biological raw materials, because it involves automating a task that is normally performed by skilled people. The raw materials also vary in terms of their size and properties. It's easy to deform or damage a chicken fillet," explained Misimi.

"And because it's so smooth, a chicken fillet is also an extremely reflective object. That makes it difficult to obtain fully detailed 3D images. The texture also means that the meat is hard to grip.

"We realised this early on when we began our research and were determined to develop a flexible system that could not only tackle variations in the raw materials, but also the mechanical challenges of extracting the fillet from the chicken."

### Mathematical 'brain surgery'

Naturally, controlling the robot is a key factor. The algorithm, or mathematical computational model, that constitutes the brain of the robot has also been developed by SINTEF. It is this that enables the robot to perform the operation to the same standard as a human being.

If the robot's arm is to be guided precisely to the raw materials with the aid of 3D images, it is essential for the





camera (the robot's eyes) and the robot itself to 'speak the same language'.

"In other words, the robot's coordinate system must be able to understand the coordinates identified by the machine vision," explained Misimi.

In order to address this problem, the robot is precalibrated to ensure that its 'hand' and 'eye' understand each other.

### How Gribbot learns to grasp chicken fillets

A transport system secures the carcass and brings the chicken to the robot and within the range of its 3D machine vision system.

- The robotic arm is equipped with a grasping tool. The tool is made up of two plates, the topmost of which is pointed and flexible, which allows it to scrape the chicken fillet away from the carcass. The 3D vision (via the camera and algorithms) recognises/determines exactly where the robot should grasp the fillet.
- When the carcass is scanned, a specially designed computer program identifies the point at which it should be grasped. The program converts the position of this point into a robotic movement that removes the fillet. In the same sequence, any remaining chicken fillet is scraped away from the carcass, thereby utilising all the meat.

### To the last shred

Gribbot has been developed as part of a larger project called CYCLE. Its main aim is to make Norwegian food production, including fish, vegetables and meat, more profitable, more environmentally friendly and more efficient. In other words - more sustainable.

"The fact is that almost half the food currently produced never reaches the consumer because it is lost along the production line due to the fact that we don't have the technology to process the raw materials," said Misimi.

### More profitable and environmentally friendly

"Automating this work will speed up production and make it more efficient. It will free up the producer's capacity and make better use of the raw materials. In the case of chicken fillets, this also means making optimum use of the material. A flexible grasping tool scrapes the carcass while it is pulling off the fillet, and this removes as much of the meat as possible," explained Misimi.


The idea is to continue developing Gribbot as part of future projects, so that it will be possible to make use of any meat that may be left on the chicken carcass after the fillet has been 'harvested' by the robot.

### \*CYCLE project

The project CYCLE will see the industry and researchers working together to utilise food that currently fails to reach the shops. Every stage from production to processing will be optimised, and every resource exploited to the full.

The project, which has a four-year budget of NOK 50 million, was launched in 2013 and is headed by SINTEF Fisheries and Aquaculture.

In 2011, an estimated 816,000 tonnes of waste raw materials were generated by the seafood industry, while slaughter waste from the meat and poultry industries amounted to 220,000 tonnes. These figures underline how important this project will be from a financial, environmental and societal perspective. The researchers will now get down to work employing tools such as sensor technologies, robotisation and increasingly environmentally friendly processes with the aim of utilising waste not only from food production, but also from food which consumers currently throw away.

The CYCLE project has broad political support. According to the Norwegian Ministry of Agriculture and Food, reducing food waste should be one of the most urgent environmental issues both in Norway and the rest of the world. The 'cyclical' approach, involving the optimal and environmentally sound exploitation of biological raw materials, combined with a focus on wealth generation, is an issue high on domestic and global agendas. 

CYCLE  
[www.cycleweb.no](http://www.cycleweb.no)



## Haigh's Chocolates to install interactive production robot



© arthabicity/Dollar Photo Club

South Australian chocolate maker Haigh's will unveil Australia's first industrial installation of a Baxter interactive production robot.

The Baxter robot includes a safety system that enables it to work without barriers and in close proximity to people.

It can be programmed to undertake repetitive and difficult production line tasks and can be easily trained to adapt to changing tasks. Haigh's plans to put the robot to work completing repetitive, menial tasks, which it hopes will free up time for its skilled chocolatiers.

Haigh's puts the cost of purchase and customisation of the robot at "just under \$100,000", \$50,000 of which has been provided by a grant from the South Australian Government through the Business Transformation Voucher program.

Manufacturing and Innovation Minister Kyam Maher said the project was recommended for funding based on the potential for Haigh's to improve its manufacturing performance and expand its production capacity. "The Baxter robot is a great example of innovation in action," he said.

Automation and control services company SAGE Automation has been appointed the Australian distributor for the Baxter robot. SAGE Automation is currently programming Baxter ahead of its installation at Haigh's Greenhill Road facility during March and April.

The robot will be visible to the more than 34,000 visitors who tour the Haigh's factory every year.



## Brisbane Produce Market awards roofing project to Wiley

The iconic Brisbane Produce Market trading floor in Rocklea, which trades more than one billion dollars' worth of fresh produce annually, is undertaking a \$10 million roofing project.

Covering 10,500 m<sup>2</sup>, the roofing project will increase shelter for Queensland's largest wholesale fruit and vegetable marketplace.

Brisbane Markets Limited (BML) recently awarded Wiley the contract to design and build stage two of the project comprising a \$3.7 million roof extension covering 2500 m<sup>2</sup>. This follows Wiley's work on stage one involving a \$6.3 million roof upgrade covering 8000 m<sup>2</sup>, which is on schedule for completion in April this year.

## Pallet wrapper with warehouse safety features



The C-One Plana pallet wrapper, available from AAA Packaging Supplies, is the first of its kind in the world, offering improvements for warehouse safety, waste reduction, packaging efficiency, productivity and reliability.

The features of the pallet wrapper include: a turntable 18 mm in height with no ramp required; a 20% saving in film usage; a 50%+ saving in film wastage; 270° access that provides greater accessibility for loading pallets while reducing warehouse issues for space; usage data enabling the ability to monitor the machine's performance and expenditure.

The wrapper also provides OHS benefits by eliminating the risk of danger and strain by pick-and-pack personnel when using standard pallet wrappers with loading ramps.

**AAA Packaging Supplies**

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



## Vision sensor

The BVS-E Universal vision sensor from Balluff has integral processing electronics, lighting and two digital outputs. It combines the functions of the BVS-E Advanced and BVS-E Ident vision sensors in the one device.

The sensor can inspect a large number of characteristics in one pass and can also simultaneously perform various tasks such as checking brightness, comparing contrasts, counting edges, checking positions, detecting patterns and reading codes at speed. It also includes tools such as a 360° contour, barcode and data matrix check, as well as the option of counting and checking contours.

The result of the check is issued either as an OK or error signal via the digital outputs or the RS232/Ethernet interface. The position of the detected part can be transmitted to a PLC or robot control, for example, so that the part can be aligned for subsequent process steps.

According to the company, the device is very fast. Up to 40 barcodes and data matrix codes are located per second and then read and verified independently of their position. The code data is available for further processing via an interface.

The sensor is available with different lens versions. In addition, integral red light or infrared LED lights illuminate the image area. The power supply and peripherals are connected via two M 12 connectors.

Approximately the size of a credit card, the sensor is easy to use via the supplied ConVIS software with intuitive user interface. To use the sensor, the user only has to connect the sensor to a PC to configure parameters and operate the sensor using free configuration software.

**Balluff Pty Ltd**

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

## Heavy-duty IP67 inclinometer

The Camille Bauer KINAX N702, INOX AiSi 316Ti stainless steel housing, hermetically sealed inclinometer is designed for fit-and-forget applications including submersible pumps (to 30 m) and marine use (INOX AiSi 316Ti is resistant to seawater). The device has an environmental temperature range of -30 to +70°C and rugged resistance to high vibration (40 m/s<sup>2</sup> 10-500 Hz, according to IEC 60068-2-6).

The measurement basis is an oil-damped magnetic pendulum and Hall-effect angular displacement (-180° to +179.99°) sensor. The inclinometer is HART 20 mA bus compatible and is therefore also highly suitable for legacy control systems. Parametrisation is achieved via standard HART programmers (Emerson, Rosemount, etc). Clockwise or anti-clockwise rotation and angular limits can be programmed. The supply voltage range is from 8 to 33 V.

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## Global footprint plastic IBC

CHEP Pallecon Solutions has launched the iCONIC plastic intermediate bulk container (IBC). The IBC, with the global footprint of 1000 x 1200 mm, has been developed to address the increasing demand for IBC packaging that can be moved across continents, resulting in sustainable cost advantages, efficiency improvements and waste reduction.

The IBC is suitable for moving, protecting and storing semi-bulk dry and liquid products. It has a carrying capacity of 1040 L, which holds more than 25% content, in the same space as four 200 L drums. The container utilises a new liner on each trip, eliminating product contamination and avoiding the process of cleaning and sanitising drums and containers after each use.

The container has an improved folding ratio of 3.5:1, meaning 98 containers can be stacked in a standard truck compared to 60 for earlier generation IBCs. The IBC is also completely recyclable, which reduces one-use product consumption and the resulting carbon footprint.

The container is fitted with non-sequential folding panels and the lid slides and locks on the back panel, making it easier and faster to set up and collapse than traditional bag-in-box systems. The four-way entry pallet base improves handling efficiencies.


The sloping pallet base results in greater discharge of product and the anti-slip locators on the steel-reinforced base ensure the units can be safely stacked. The IBC can be used in conjunction with CHEP's existing suite of food-grade liner bag solutions.

**Chep Pallecon Solutions**  
[www.chep.com/pallecon](http://www.chep.com/pallecon)

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## Parmalat milks the potential of voice picking technology

Parmalat is one of Australia's largest dairy producers and in 2014 was named Woolworths' Core Fresh Supplier of the Year. One of the company's key warehouses is its Lidcombe distribution centre (DC) in western Sydney.

"The Lidcombe DC is very important to our business as we service a number of high-profile customers across a wide area, and it is imperative that our warehouse runs as effectively as possible in order to deliver perishable dairy goods fresh and on time," explained Guy Romeo, national logistics transformation manager, Parmalat.

Parmalat enlisted the help of Dematic to investigate how technology could help them optimise their current processes in the Lidcombe facility. Parmalat's overall goal in implementing the new system was to achieve greater utilisation of their labour to improve overall warehouse efficiency. To achieve this, Parmalat needed to upgrade to a system that offered more visibility, so they were in a position to specify what tasks employees fulfilled at all times.

"The basis of Dematic's initial investigation on the DC floor was for us to look at what was traditionally a paper-based process and to determine how we could implement technology to help speed that up," said Seth van Dijk, sales manager, Dematic. "Dematic investigated a number of different technologies but determined that voice picking was the optimal solution."

Icon Integration and Dematic worked with Honeywell Scanning & Mobility (HSM) to design and employ a new voice-directed smart SAP WMS solution capable of delivering a competitive edge for Parmalat. The WMS solution and the Honeywell Vocollect voice technology solution replaced a paper-based picking system.

"Parmalat's business is fast-moving consumer goods with a short shelf life; therefore, it was vital they introduced automated processes that led to less travel time, better rotation of stock, less wastage and ultimately an increase in the litres per man-hour," explained Jason Nalewabau, director, SAP



Logistics Execution Solutions, Icon Integration. "We had the tools at Icon to automate Parmalat's new smart WMS design and on top of that we overlayed the Honeywell voice system to get the visibility and speed of execution in the warehouse."

Parmalat achieved productivity and safety improvements through Honeywell's Vocollect voice solution's 'hands-free and eyes-free' qualities, which means employees no longer need to look down or put down papers and scanners to pick up a unit or crate of stock. The DC also is better organised and stock is moving a lot more freely since the new system was deployed.



"Under the new WMS and voice-directed picking system, we've experienced a 15% improvement in terms of our litres per man-hour," Guy Romeo said. "As a result, we're not only reaching our targets, but exceeding them, even during peak periods such as the Christmas that has just passed. For a fast-moving picking environment, using voice with your WMS is the only way to go."

Parmalat's new voice-directed picking solution has not only been designed for use in warehouses distributing milk in nondescript crates, like Lidcombe, but also Parmalat DCs that predominantly distribute other product categories including cheese, soft dairy and UHT milk.

"We are thrilled to see Parmalat is already reaping the rewards of enhanced efficiency, productivity and accuracy that are delivered by voice technologies," said Paul Phillips, regional manager - Australia/New Zealand for Honeywell's Vocollect Solutions. "Customers supplied by Parmalat's Lidcombe warehouse are also benefitting from the enhanced order fulfilment performance they are now able to offer."

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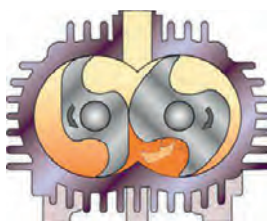
## IBC for liquid transport in food industry

Loscam has announced the release of the IBC I8, an intermediate bulk container designed for the transportation of liquids in the food industry. It is suitable for products including dairy, vegetable oil, fats, honey, syrups and mayonnaise, and also allows for the safe transportation of acidic-based liquids such as fruit juices and vinegars.

The IBC I8 is made from food-grade polypropylene and features a hygienic 'bag in a box' system that makes it easy for food and manufacturing companies to fill, transport and discharge product. It has a 1060 L capacity, is freezer compatible and is UV resistant. The IBC's sight glass provides clear view of the product level while the tamper-evident and lockable lid assures product safety.

**Loscam Ltd**

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



## Energy-efficient vacuum pump

Busch Mink rotary claw vacuum pumps can reduce energy consumption by 25% or more as the non-contacting, friction-free design ensures energy is not wasted from internal friction or drag. When matched with PLC-based variable speed controls, energy efficiency is further enhanced, providing true on-demand operation. Mink series vacuum pumps are available in a variety of sizes and configurations

to best suit different requirements. All pumps feature 100% oil-less compression, are air-cooled, have TEFC motors and are suitable for variable-speed operation.

The pumps feature pumping speed to 325 CFM with vacuum to 15 Torr. Busch Mink series vacuum systems are available in standard or custom configurations for industrial and laboratory applications. A wide range of optional accessories and controls, including PLC-based variable speed controls that further enhance energy and maintenance savings, is available.

Inside the pumping chamber, two 'S' profile rotors driven by gears spin in opposite directions. As the rotors pass the inlet, a void is created and the trapped air is pushed to the exhaust side where it is first internally compressed and then discharged. A small, fixed, gauged clearance is maintained between all moving parts. Due to this, there is no friction or wear and oil is not required in the compression chamber for lubrication, sealing or cooling.

**Busch Australia Pty Ltd**

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

## Supply chain management software

The StorageQ Supply Chain Management system has been developed using the latest technologies to be easy to use for all supply chain staff. It provides accurate, easily accessible stock information, reduces admin tasks by removing redundant paper flows and data entry, and produces detailed reporting and real-time dashboards. The system offers easy integration with warehouse equipment and other IT systems, plus the support of an expert tech team at OnQ software. By reducing admin and empowering decision-makers with key information, there is significant return on investment and cost savings to be generated through implementing StorageQ. The system is available both on the cloud and on-premise, which ensures its suitability in all supply chains.

The Inventory On Demand (IOD) module gives the user the power to control inventory at its source. IOD allows for forecasting on a per product basis what the volumes will be for a given time frame and where those volumes are located. Then orders can be expedited to meet demand and allocated to a location to be shipped directly from the supplier and/or manufacturer.

StorageQ is developed, supported and owned by the Australia-based OnQ Software.

**OnQ Software Pty Ltd**

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





# Bega Cheese prioritises safety with assisted handling equipment

Located on the South Coast of NSW amongst idyllic holiday locations, Bega Cheese has grown to be a \$1 billion turnover company, manufacturing a range of cheeses to suit a variety of palates: from cream cheese, which is highly sought after in Asia, through to the gold medal-winning 'Strong and Bitey Vintage Cheddar'.

Darryl Flaherty, production manager - process improvement, says that safety is paramount in their manufacturing plant, and is considered as 'caring for mates'.

"Bega Cheese also realise that accident downtime is to be avoided and have always been prepared to outlay investment to prevent potential accident situations, which has an immediate return on investment," Darryl said.

An example of such an investment has been the utilisation of Tawi vacuum-assisted lifting systems and Protema hoists from Kockums Bulk Systems.



*Use of the Protema trolley to enable pick or place a roll of labels*

This trolley system means there is no need for rollout racking to be installed. With the Protema trolley rolled under the bottom shelf, the core gripper is able to reach the rear rolls. It is then inserted and grips instantly by touching the control lever. The roll is then lifted by the mast attachment, using the hand control, and the trolley enables moving it to a packaging machine.



*A Kockums core gripper attached to a hoist is used to reposition another sized roll*

The core gripper is introduced into the core, and at the touch of the lever an attachment is made, and the roll is then lifted and relocated:

At the stage of release, the core gripper is rotated through 90 degrees, which allows the roll to be placed on the shelf, and the core gripper extracted:



*Tawi vacuum operated Vacu-easylifts are used to pick a pair of boxes simultaneously for de-palletising, and then positioning them onto a conveyor*

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## Robotic tank inspection

J. Furphy & Sons has launched a robotic tank inspection service to increase safety, reduce risk and improve the accuracy of tank inspections.

Climbing robot technology provides remote access to view the interior surface of a tank. It captures high-definition video to identify surface cracks, fatigue or maintenance requirements. The robot features sliding vacuum pads and a Hi-Grip caterpillar track, and is computer controlled to move up, down and around the interior tank surface, adapting to different surface conditions.

The technology is suitable for any industry that uses tanks for liquid storage. The system was originally developed for the dairy industry and is suited to food-based products, consumables, pharmaceuticals or any products with hygiene requirements.

Robotic testing replaces the manual process of using abseilers, scaffolding and rope to conduct an inspection. It reduces the number of contractors needed, as only one controller is required. It also reduces the incidence of human error and has OHS benefits: increased safety, the elimination of confined space entry and personnel are not required to work at height.

**J Furphy & Sons Pty Ltd**  
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## High-pressure cleaning system for containers

The RAN 3080 high-pressure cleaning system combines the high-pressure process with an efficient transportation system, allowing for residue-free cleaning of up to 400 containers/min.

The machine consists of a rotary platform for cleaning and an identical rotary platform for drying. Following the infeed, the transportation system first grips the container by its closure caps. This enables cleaning of virtually the entire container surface, including the neck. The ring nozzles of the cleaning station operate with high pressure, washing the containers from top to bottom. Additional bottom nozzles provide for clean container bases. Pressurised air continuously flows across the closure caps. It stops moisture from getting to the closure rim and into the containers, thereby preventing product contamination.

The system features three individual washing stations, which enable the cleaning processes to be adapted to user requirements. Up to three different media can be used per cycle. Drying also takes place at three stations. Thanks to a strict separation of cleaning and drying areas, the machine prevents a recontamination of the containers after washing.

Depending on production requirements, the washing machine can be equipped with different containment devices: options range from containment housing for the protection against harmful and toxic substances to macrolon covers for non-toxic applications. An optional circulation system achieves savings by consistently re-using slightly contaminated cleaning media.

**Nupac Industries Pty Ltd**  
www.nupac.com.au

## GPS/GPRS track-and-trace module

KCS has extended its TraceME product line with an advanced module, targeted for worldwide mobility in the Internet of Things era.

The latest development of the GPS/GPRS track-and-trace module will combine the RF location-based positioning solution with the LoRa technology. This combination enables 'smart objects' to be even smarter, since LoRa enables long-range, battery-friendly communication in a wide variety of (M2M) applications.

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Good conditions for

# Australian seafood industry growth

The outlook for the seafood sector is bright, with continued growth in seafood consumption both in Australia and overseas providing new markets and opportunities for Australian producers according to ABARES Fisheries Economics Director Robert Curtotti.

“Both here and abroad, the conditions for Australian seafood producers are very positive with a falling Australian dollar, easing labour market pressures, rising demand, lower fuel costs and a number of free trade agreements coming into force,” Curtotti said at the launch of the March issue of the ‘Agricultural Commodities’ report at the Outlook conference in Canberra.

“Seafood consumption is rising worldwide, and production is growing to help meet that demand - global production of seafood is now around 160 million tonnes and rising.”

“Almost all this growth in global consumption is being met by aquaculture, and Australia is matching this trend with aquaculture’s share in gross value of production increasing by 12% since 2003-04 to 43% and \$1.1 billion in 2013-14.”

“Wild catch fisheries production value has also increased to \$1.5 billion in 2013-14.”

“Being an export-focused industry, all these factors combine


to make Australian seafood products very competitive in an international market.”

Curtotti was joined at the session - sponsored by the Fisheries Research and Development Corporation - by Parliamentary Secretary to the Minister for Agriculture, Senator Richard Colbeck, as well as industry representatives, to present these forecasts and discuss the future of the industry in Australia.

Senator Colbeck chaired today’s session and highlighted the opportunities that exist for Australia’s fisheries industries.

“Australia’s fisheries are among the best managed in the world and this government believes there are significant opportunities for the industry to grow,” Senator Colbeck said.

“We are working with industry to reduce regulatory burden and remove unnecessary red tape - this will help create a more profitable and sustainable future for our fisheries.”

This analysis was part of ABARES Outlook 2015 that was held in Canberra in early March. 





## Skidders for meat, fish and poultry

Townsend Skidders, available from Marel, process in three stages. Firstly, pressure is applied by the machine's shoe and blade assembly, then a sharp tooth roll pulls the product across the blade and shoe and finally, a sharp blade separates the skin or membrane. All three processes are synchronised in order to maximise yields.

The skidders are custom designed and built to suit the specific needs of meat, poultry and fish processors. According to the company, they offer the highest yields of any skidders on the market, as well as offering a low cost of ownership, due to the equipment's durable construction, ease of maintenance and fewer parts than comparable equipment. Operating speed can be matched to operator capability in order to ensure safer operation and the skidders are easily sanitised.

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## Multidrum breeder for 'homestyle' breading

The GEA MultiDrum breeder can re-create 'homestyle' breading on an industrial scale. Typical homestyle (or Southern-style) breaded coating looks homemade, with a very coarse, crunchy texture that has been difficult to re-create in an automated process.

The breeder overcomes the challenges by splitting the product stream and feeding the products into multiple drums. The products leave the drums evenly spread across the belt. The pick-up percentage is controllable, and the machine requires considerably less space than a single-drum breeder and associated spreading belts, which means the overall line is shorter and labour requirements are reduced by up to 80%, according to the company.

The breeder is available in a three-drum configuration (1000 mm wide) and a twin-drum configuration (600 mm wide) and is suitable for boneless and bone-in products, including drumsticks, wings, thighs, tenders, fillets, chicken popcorn and nuggets.

To enable the creation of coating according to specific recipe and product requirements, the breeder features adjustable flour bed level, drum angle and drum speed. This enables the pick-up percentage to be accurately controlled. The technology used in the breeder reduces the amount of dust in the work environment, and the drums can automatically be lifted to a special cleaning position. The system offers cost savings in flour usage, as flour can be re-used in many applications, while shorter machine cleaning time, less water usage and reduced factory cleaning also reduce costs.

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## Quick test method developed for fish toxin

The recent scombroid poisoning scare will no doubt leave many consumers wary of purchasing seafood. In a case of perfect timing, Flinders University researchers have announced a revolutionary method to test for histamine in fish.

The method uses a microfluidic chip the size of a credit card that tests for histamine without the need for complex chemical additives. The microfluidic chip is fitted with electrodes that detect histamine levels as the sample passes through a tiny pipe in the plastic device.

"We extract different compounds from the fish in liquid form, and these compounds will pass through the device at different rates," said Associate Professor Claire Lenehan, a lecturer in forensic and analytical chemistry at Flinders.

"We can tell what compounds are histamine and how much histamine is contained in the sample, based on the rate at which the compounds pass through the device."

Associate Professor Lenehan says the method is much more efficient and cost effective than current testing methods.

"At the moment the extraction of compounds takes longer than the actual analysis because you have to pulverise the fish, add a chemical to turn it into a different chemical and then test it," she said.

"It's an indirect testing method because you're not actually detecting histamine at all; you're detecting a product of histamine. Our method is a much simpler way because all you do is extract the sample and pipette it into the device without having to chemically treat it first." The device could also be used by consumers who have histamine sensitivity to test foods before they consume them. The research has been published in the international journal *Analytical Methods*.



## Meat exporter moves into dairy powder processing

SPX Corporation has been awarded a contract to help establish a new dairy powder processing plant in Australia. SPX's Flow Food and Beverage business was awarded the contract from the Midfield Group for the facility, which will produce both whole and skim milk powder and will also include an anhydrous milk fat (AMF) processing line.

The processing plant will feature an array of SPX equipment including a new preheating process to provide longer run times, enhanced evaporation technology and will utilise SPX's 'Triple-A' dryer enabling production of high-quality milk powders. Midfield is one of Australia's largest meat exporters. This project marks its first foray into the global dairy industry. "We continue to leverage our global dairy processing expertise to expand our presence in Australia and the Asia Pacific region," said Marc Michael, president of SPX Flow Food and Beverage.

"We look forward to working closely with Midfield Group to establish a state-of-the-art milk powder processing plant to help them grow their global business." Work will begin on the project in early 2015 and the new plant is expected to begin operations in mid-2016.



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# Lobster offcuts recycled to create new ingredients



In a bid to reduce waste from the harvest and export of southern rock lobsters, researchers are working to find innovative ways of using leftover shells and parts.

Researchers from Flinders University and the South Australian Research and Development Institute (SARDI) are working with Adelaide-based lobster exporter Ferguson Australia to help the company generate new products from lobster offcuts. So far, the team has developed prototypes including lobster essence oil, protein powder and chitin.

Flinders PhD candidate Trung Nguyen, who is working on the project, said the lobster oil and protein powder could be used as functional ingredients in a range of foodstuffs, from stock bases to crackers, while the chitin could have a wide range of applications, from food and cosmetics to biomedicines, agriculture and the environment.

"The lobster-derived chitin, chitosan, could be used as a food preservative, a wound dressing to speed up the healing process or as a surgical glue to bind cuts and wounds," Nguyen said.

Nguyen said the extraction of lobster compounds uses cutting-edge advanced manufacturing processes such as supercritical CO<sub>2</sub> extraction and microwave-assisted extraction, which produces a product that is of high purity while also being cost effective and environmentally sustainable.

Flinders Centre for Marine Bioproducts Development Manager Raymond Tham said the products, once refined, will be marketed to potential partners in the food industry.

"There's a real opportunity to make sure none of our high-value seafood is ever wasted, and that they are used to produce products that currently do not exist on the global market," Tham said.

Ferguson Australia Managing Director Andrew Ferguson said the creation of new products from leftover lobsters would enable the company to reduce its waste management costs and improve environmental and resource sustainability.

"These products will reduce the amount of lobster waste sent to landfills, which has a high cost for both the business and environment, but will instead have a higher retail value and longer shelf life to reach wider export markets," Ferguson said.



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## Forming and Portioning with a difference

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# What food firms need to know about meat and poultry recalls

When food firms face a meat or poultry recall, several factors determine how that recall affects the firm's bottom line.

**A** recent Kansas State University study used stock market prices to determine costs of recalls to food firms and what recall factors are most impactful economically.

Food safety is top of mind among many consumers and producers of food. It is also a continuum, because the more a food firm spends on effective technologies and protocols to ensure safe food, the greater chance the foods are protected against contamination.

Despite a blanket desire to keep foods safe, eventually food firms reach a price point - a limit they can spend feasibly to ensure staying in business and giving consumers an affordable product, said Ted Schroeder, professor of agricultural economics at Kansas State University.

"The more a company knows about the anticipated impact of a recall event, the better it can make a decision about adopting new food safety protocols, new technologies or new surveillance methods to reduce the probability of a food safety breach," Schroeder said.

Schroeder, along with Veronica Pozo, assistant professor of applied economics at Utah State University, recently found that when food firms face a meat or poultry recall, several factors determine how that recall affects the firm's

bottom line. The most impactful factor is the class of the recall, which determines if a severe human health hazard is involved. Other factors include the size of the recall, size of the firm, if the firm has prior experience dealing with a recent recall and the media coverage surrounding the event.

## A close look at publicly traded food firms

The researchers examined meat and poultry recalls that took place between 1994 and 2013, based on availability of recall data from the US Department of Agriculture's Food Safety and Inspection Service (FSIS). The FSIS showed more than 1200 meat and poultry recalls happened during that time, and 163 of those recalls came from 31 different publicly traded firms.

Although 163 of more than 1200 recalls may seem like a small number, publicly traded firms accounted for almost half of the total meat and poultry products recalled, said Pozo, who was a K-State doctoral student when the research was conducted. In fact, 277 million out of 638 million total recalled pounds, or 43%, came from publicly traded firms.

Although it's difficult to obtain financial data from firms and measure total direct costs and losses of revenue from a recall, price reactions in the stock market surrounding a





recall event tend to indirectly reflect all the private costs, Pozo said.

“Some recalls would have gotten out to the consumer and some would not have,” she said. “Regardless, calculating the actual physical cost of a recall can be quite daunting. You have to track volume of product, determine if the product was disposed of or the firm got an alternative value for it, and the cost of all people involved, including sales losses and liability costs.”

“Our claim is all private costs - costs the company itself ends up realising - will ultimately be reflected in the stock price through the value of the firm,” Schroeder said. “The stock market is efficient, meaning it rapidly incorporates information and embeds it into the stock values. It is a widely accepted method for evaluating event studies.”

What the stock price does ignore is public costs, he said. For example, if someone gets sick from a recall and it never resonates back to the firm, someone else likely paid for that. It wouldn't necessarily show up in the stock price.

“Our goal was to look at individual, private firm costs, because if I'm a company that's in the food processing or merchandising segment, I need to have a sense of what the impact of these (recall) events can be on my company,” Pozo said. “If we show firms how costly a recall can be, then they will be able to conduct a cost-benefit analysis to decide if it's worth it to implement additional (food safety) technologies.”

In addition, Pozo said the study shows investors the importance of finding out more about a firm's food safety protocols.

“I've seen publicly traded companies that went bankrupt after one recall,” she said. “And although companies do as much as they can to avoid these types of events, food safety outbreaks are still possible. Firms must have a good plan in place. Investors must find out about those plans before investing.”

### Recall reflections in stock prices

The researchers found it took about four to five days, on average, for the stock price to reflect a recall. If a major health hazard was part of the recall, the stock price could take a hit earlier, potentially within one day.

Investor and firm interests often go hand in hand during a recall, Schroeder said. In the stock market, especially as a recall progresses, there's uncertainty and emotion.

“Our results show investors do respond fairly quickly, within the day of the recall or as soon as the markets open after the recall,” he said. “As the recall continues to unfold, the market will adjust, and it's either going to go down further or readjust back up if the confidence and handling of the recall is made known.”

Regardless if a health hazard was part of the recall, the researchers found the stock price returns decreased on average 0.63% within five days. A health hazard jumped that decrease to an average of 1.15%, which could translate to a loss of hundreds of millions of dollars for some firms.

A breakdown of factors that most impacted stock price reactions:

#### 1. Severity

Class I recalls pose a major health hazard compared to Class II and Class III. The researchers found the seriousness of the human health risk, brought on by *E. coli* O157:H7, *Salmonella* or *Listeria* as examples, would impact shareholder losses to the greatest extent.

#### 2. Recall size

The larger the recall, the more financial damage the firm would face, according to the researchers. Knowing that recall sizes matter, it may behoove firms to test products in smaller lot batches to help prevent a large-scale recall, but they would need to weigh the costs to implement this practice.

Further, firms should know that combining acute health urgency in a Class I recall with a large recall size would make the most sizeable market reaction.

#### 3. Firm size

Some of the financial hit from a sizeable Class I recall can be countered if the firm is large and more diverse, said the researchers. In addition to immediate private costs, insurance premiums for the firm also would likely rise.

A large firm won't have near the stock market impact as a smaller publicly traded firm that relies heavily on that particular meat or poultry product as its main line of business. Smaller, more homogeneous firms are more apt to go bankrupt from one recall.

#### 4. Firm's experience


Say a firm experienced one recall and within a year faced an additional recall. The researchers found the impact of the second recall would still be adverse, but because the firm showed it could manage a recall situation, all the possible repercussions from the second recall didn't have as much effect as the first.

The firm's customers, investors and consumers are often more at ease after the firm shows it can bounce back from one recall. If a company is experiencing one of its first recalls, it might benefit from leaning on experts who know how to navigate a recall to minimise financial damages.

#### 5. Media

Media has an important effect on how a processing or manufacturing firm's customers, investors and consumers perceive the company. The larger the number of media articles about the recall event, the more damage it would likely cause the firm related to that particular recall.

Most of the media articles related to the recalls under study were informative, but they carried a negative tone, according to the researchers. Results suggest value in firms having a media plan in place if a recall were to occur.

More details about these and other recall factors are available in the full report, *Costs of Meat and Poultry Recalls to Food Firms*, which can be found on K-State's Ag Manager website. 

*I've seen publicly traded companies that went bankrupt after one recall.*



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## Solar power and LED lighting a hit for meat facility

At the Tip Top Butchers meat facility in Melbourne, a 202 kW solar PV array and 108 high-bay LED lights were installed in 2013 with grant funding support from the Clean Technology Innovation Program (CTIP). The solar and energy-efficiency outcomes following the installation for the first 12 months have now been assessed by Enhar, which provided an energy audit and assisted with the original grant application.

The 5500 m<sup>2</sup> meat facility, based in Laverton North, includes a shop outlet and wholesale service to customers throughout the city and beyond. Designed by Tip Top's Kent Goodwin to maximise productivity and optimise energy efficiency, the facility's temperature is carefully controlled via state-of-the-art computer systems and high-tech refrigeration equipment and freezer rooms.

Already a highly efficient site, the addition of the 202 kW solar array has taken Tip Top's energy efficiency to a new level. The array was installed by Euan Angus Solar using LG panels and Fronius inverters, while Clean Technology Partners provided solar engineering services. LED lighting was also installed for all high-bay lighting in the working areas of the factory.

The company's meat manufacturing process now uses 31% less energy from the grid per tonne of production, and the solar array produced 5% more energy than expected in its



first year of operation. The business is now said to be one of the lowest carbon meat producers in Australia.

Enhar has assisted Tip Top and many other manufacturing businesses to obtain grants for efficiency and solar. According to the company's director, Demian Natakhan, Tip Top's results show how "solar and LED lighting can reduce energy consumption in food industries by 30% or more".

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# Processing





## Thousands of tonnes of fake and sub-standard food seized

4000 kg of counterfeit strawberries and 275,000 litres of drinks were only part of the haul of fake and sub-standard food seized in a recent INTERPOL and Europol operation.

**O**pson IV, a coordinated operation run by INTERPOL and Europol and involving 47 countries, uncovered thousands of tonnes of fake and sub-standard food and drink during December 2014 and January 2015.

The operation resulted in a number of arrests across the globe and investigations are continuing. Among the aims of the operation is to identify and disrupt the organised crime networks behind the trafficking in fake goods; enhance cooperation between the involved law enforcement and regulatory authorities; and to raise public awareness of the dangers posed by fake and sub-standard food and drink.

Involving police, customs, national food regulatory bodies and partners from the private sector, checks were carried out at shops, markets, airports, seaports and industrial estates.

"This year again, the results from Opson clearly reflect the threat that food fraud represents, as it affects all types

of products and all regions of the world. Cooperation at national and international level is indispensable to disrupt the criminal gangs involved in this business," said Chris Vansteenkiste, head of Europol's Focal Point Copy who co-ordinated the activities in Europe.

Of the nearly 275,000 litres of drinks recovered across all regions, counterfeit alcohol was among the most seized product.

"Fake and sub-standard food and drink pose a real threat to health and safety. People are at serious risk and in some cases dying because of the greed of criminals whose sole concern is to make money," said Michael Ellis, head of INTERPOL's Trafficking in Illicit Goods and Counterfeiting unit which coordinated activities between the world police body's participating countries across the globe. "Through this operation, thousands of tonnes of potentially hazardous food and drink have been taken out of circulation."





## Operation Opson IV - Some highlights (or should that be lowlights?)

### France

French customs seized nearly 4000 kg of counterfeit strawberries at Roissy Charles de Gaulle airport. In addition, some 10 kg of caviar were discovered in passenger luggage during targeted checks at the airport.

### Italy

In Arezzo, Tuscany officers from the Carabinieri NAS discovered a fish processing facility selling previously frozen seafood as fresh. The seafood had been sprayed with a chemical containing citric acid, phosphate and hydrogen peroxide to disguise the fact that it was rotting.

More than 30 tonnes of seafood were seized at the site in addition to 1.6 tonnes of chemicals. After identifying links to a second company in Spain, cooperation between the Carabinieri and the Spanish Guardia Civil led to the interception of a consignment of another 15 tonnes of fish due for delivery to Italy.

In a second case, in Salerno in Southern Italy, Carabinieri detected a new modus operandi in relation to the production of fake mozzarella.

During a check at a cheese factory, officers found a large amount of curd originating from Eastern Europe in addition to other dairy products which were already past their expiration date, or were not being stored in compliance with regulations. The presence of chemicals including citric acid and sodium hypochlorite suggested the dairy products were being treated to give it the appearance of fresh mozzarella.

The mozzarella was then being smoked in the back of a van, with rubbish being burned as one of the heat sources.

### United Kingdom

An illicit factory producing fake name-brand vodka was discovered by Derbyshire County Council Trading Standards team. Officers discovered more than 20,000 empty bottles ready for filling, hundreds of empty five-litre antifreeze containers which had been used to make the counterfeit alcohol, as well as a reverse osmosis unit used to remove the chemical's colour and smell.

A large quantity of fake bottle tops, hundreds of unauthorised boxes marked with the brand and used labels were also seized.

### Belgium

Joint inspections by Belgian Customs and the Food Safety Agency at Antwerp and Zeebrugge harbours and Zaventem

airport resulted in the seizure of food supplements allegedly derived from traditional Chinese medicines. Analysis of the product showed they contained high concentrations of mercury.

### Hungary

An illegal slaughterhouse was shut down, where officials also seized cars which had been modified to incorporate hidden compartments to smuggle fake alcohol.

### Spain

More than 2400 checks and inspections were carried out during Opson IV, resulting in the identification of a company selling coffee labelled as 100% Arabica which was actually a mix of different low-quality coffees. The three managers have been charged following the joint investigation by

the Guardia Civil, Laboratories of the Ministry of Agriculture (MAGRAMA) and the National Agency for Consumers, Food safety and Nutrition (AECOSAN).

### United States

The US Food and Drugs Administration focused efforts on dietary supplements sent by mail with inspections at Los Angeles

Airport resulting in the seizure of illicit substances.

### Thailand

Some 85 tonnes of illegally imported meat that had not been tested to ensure it complied with health and safety regulations were destroyed. The police also dismantled a criminal network producing fake whisky and seized nearly 20,000 litres of the counterfeit alcohol.

### South Sudan

An unlicensed water bottling plant was shut down.

### Egypt

Egyptian authorities seized 35 tonnes of fake butter and dismantled a factory producing fake tea.

### Rwanda

Officers raided a shop selling fake beer where genuine bottles which had been previously collected were refilled for sale with a locally brewed product.

Countries which took part in Operation Opson IV: Austria, Belgium, Benin, Belarus, Botswana, Bulgaria, Burundi, Colombia, Côte d'Ivoire, Croatia, Czech Republic, Denmark, Ecuador, Egypt, Eritrea, Estonia, Finland, France, Hungary, Iceland, Ireland, Italy, Kenya, Latvia, Lithuania, Luxembourg, The Netherlands, Norway, Paraguay, Peru, Philippines, Portugal, Romania, Rwanda, South Korea, South Sudan, Spain, Sudan, Sweden, Tanzania, Thailand, Turkey, Uganda, Uruguay, United Kingdom, USA and Vietnam. 

*French customs seized nearly 4000 kg of counterfeit strawberries at Roissy Charles de Gaulle airport.*



## Direct-fired fryers

FOODesign has launched the immerso-cook 16 direct-fired fryer range. Suitable for chips, snacks, prepared foods, meat, poultry, seafood, battered and breaded

products, the frying system optimises production, lowers operating costs and improves environmental performance.

The fryers feature a belt feed system that can be customised for a wide range of foods to minimise the risk of product damage while maximising throughput speeds. To ensure product quality is not compromised by the waste typically associated with battered and breaded applications, the system's base-mounted mesh belt conveyor continuously discharges debris to remove all waste from the fryer.

Through a continuous oil filtration process, the fryer maintains the clean oil through particulate removal and fresh oil infeed. This prevents oil overheating and removes the potential for fatty acids and free radicals to form and compromise finished product integrity.

The system offers manufacturers precise temperature control and a high-efficiency heat exchanger. This compact serpentine tube design reduces system footprint by increasing heat transfer to deliver high-quality, uniform products at rapid throughput rates. The fryer, which is designed in heavy-duty stainless steel for ease of cleaning, servicing and maintenance, can be integrated with other equipment such as batter and breading applicators and drum pre-dusters.

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## System for management and treatment of production wastewater

Aerofloat has developed a system to manage and treat production wastewater from the food industry. The Aerofloat unit is compact, easy to maintain, has low power requirements and produces a high-quality effluent to meet regulatory standards.

Aerofloat has installed a number of projects for newly built food processing manufacturing facilities, and the unit is also suitable for existing sites that are consistently exceeding their trade waste licence. It provides an affordable solution to comply with the regulatory requirements.

The Aerofloat product uses a version of the well-known water treatment process called dissolved air flotation (or DAF). Unlike traditional DAF systems, which use large and expensive mechanical scrapers to remove solids, Aerofloat's patent-pending technology hydraulically raises the water level in the sealed, odourless DAF tank, pushing the floated pollutants off the top of the tank via a pipeline into the waste holding tank. The Aerofloat products range in treatment capacity from 7 to 800 L/min.

Pre-treatment of trade wastewater by a system based on the DAF principle is a commonly used best practice option where grease arrestors or other simple passive pre-treatment devices are inadequate.

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- Used for the lubrication of all types of grease bearings commonly found in canneries, beverage bottling plants, potato chip plants, poultry processing plants, meat processing plants and other food processing plants.
- Complies with Food and Drug Administration (FDA) federal Regulation 178.3620.

### Features & Benefits:

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## Heavy fuel viscosity meter for demanding applications

Emerson Process Management has introduced the Micro Motion Heavy Fuel Viscosity Meter (HFVM) Viscomaster, the next generation of the Micro Motion 7829 Viscomaster direct insertion viscosity and density meter. The HFVM incorporates a robust, low-friction, diamond-like carbon (DLC) coating that is suitable for tackling demanding process applications such as marine heavy fuel oil (HFO) combustion control, marine gas oil (MGO) viscosity control and land-based fired heaters.

The head-mounted transmitter is hazardous area approved and has the flexibility to connect to control systems via a wide range of digital and analog protocols. System integration and start-up commissioning costs are said to be reduced due to the support from 4-20 mA, HART, wireless HART and RS485 Modbus communications. The product accepts and processes external signals from other field instrumentation such as temperature and mass/volumetric flow devices, enabling the meter to calculate and output enhanced process measurements while minimising installation and cabling costs.

The HFVM also incorporates a diagnostic capability called Known Density Verification (KDV) that checks the meter for measurement alarm conditions, sensor integrity and the presence of coating, erosion or corrosion. This technology expands the availability of diagnostic information in critical viscosity and density measurement applications, which can result in significant maintenance costs and cycle time reductions.

**Emerson Process Management**

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

## Web-based cost estimator for recall incidents

AIG has developed NOVI, a free, web-based service to help food and beverage manufacturers estimate the cost of recall incidents.

The service can estimate a company's probable maximum recall loss in the event of an accidental contamination.

The estimation process uses more than 80 data points and a methodology based on the company's experience as well as analysis of thousands of global recall incidents and input from a food safety consultant.

**AIG Insurance**

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## Chemical-free disinfection systems for the food industry

Disinfection using ultraviolet (UV) light is a chemical-free, environmentally friendly and sustainable method for killing pathogens and food-spoiling microorganisms in potable water, recycled water and other liquids. bestUV specialises in providing solutions for the toughest water disinfection challenges in the food and beverage and pharmaceutical industries.

Designed and built in the Netherlands, bestUV carefully considers the application, target organisms and site-specific properties of the application to provide the right solution. This can include compact L-shape UV systems with the highest UV density low-pressure (LP) long-life lamps or the strongest medium-pressure (MP) UV lamps. Either solution comes with automatic UV intensity control.

All systems are designed using computational fluid dynamics (CFD) and validated with biodosimetric tests, so that users have confidence that the system works and the water is safe. To minimise maintenance, bestUV systems can be equipped with integrated cleaning devices, operated either automatically or by hand.

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# Waste sucks!

## How vacuum technology can reduce wastewater

**In food processing, waste can beget waste: disposing of non-edible waste through wastewater and the cleaning of equipment can waste considerable quantities of water.**

**M**odern-day consumers demand more than just a quality product: they also want assurance that the product was made using responsible manufacturing practices and conscientious handling of natural resources.

In a bid to reduce the amount of wastewater produced in food processing, Fraunhofer UMSICHT has launched the BioSuck project with an international working group on redesigning waste management in the food industry.

The group has found that, by suctioning off the waste using vacuum technology, less wastewater is incurred, which, in turn, reduces the disposal costs. The waste is transported hygienically and concentrated via the vacuum pipes and can be recycled or used for bioenergy.

The project aims to develop a system and guidelines to outline when and where the installation of vacuum pipes for waste collection is advisable.

### **Win-win: saving money while improving sustainability**

Installing vacuum lines for waste transport has several benefits: water use and costs are reduced, and wastewater disposal costs can be reduced by up to 50 to 80%, depending on industry sector.

By using negative pressure, food waste residues reach a collection site hygienically and quickly via a pipe system. From here, there are several options for disposal. Residual waste can be incinerated, converted to biogas or bioethanol in fermentation plants, or valorised into a lignite coal-like product by means of hydro-thermal carbonisation (HTC).

Nutrients extracted from organic waste can be fed directly back into the manufacturing process or used as a

source material for nutrient-rich fertilisers. To save space, the thin vacuum lines can be installed on the ceiling. They reportedly prevent odour nuisance and can be adjusted to changes in the production process quite easily. This type of system also prevents rodents and other pests from accessing the waste - something of vital importance in the food industry.


### **Support system**

While such a system makes good economic sense, it can help companies improve their image in terms of sustainability. With this in mind, the BioSuck project team is developing guidelines and a system that supports food industry decision-makers with strategic decisions and planning with respect to resource management.

Part of this process involves the waste streams from a range of food industries (beverages, dairy products, meat, fish, etc) being inspected for nutrients by means of spectral analysis. These analyses are entered into the system's database for reference. Additionally, practice-focused case studies are integrated into the decision support system.

Fraunhofer UMSICHT is designing a test pilot system for waste concentration by means of vacuum technology that will simulate the practical application on a small scale. The database will indicate exactly where waste is incurred, how it is best collected and what a further utilisation of waste might look like.

Further plans include a sustainability analysis of the technologies and processes, and an assessment of the environmental impacts to identify opportunities for improvement.

More information about the BioSuck project is available from [www.biosuck.eu](http://www.biosuck.eu). 





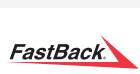
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## X-ray analyser for meat

The FOSS MeatMaster II X-ray analyser enables meat producers to measure the fat content of entire batches of meat and at the same time check for foreign objects.

According to the company, installation of the X-ray analyser has resulted in savings of around \$4000/day, through the more rational use of raw materials as the continuous X-ray test results help producers to get the right fat/lean mix in their products. This leads both to improved yield and more consistent quality.

This version of the analyser is half the length of the original unit, making it easier to integrate as an 'inline' analyser in production plants.

The X-ray analyser has a capacity of up to 38 tonnes/h for analysis of raw meat and the technology can scan all meat, regardless of the size of the pieces and whether they are fresh or frozen or packed in sealed plastic or cardboard boxes. The system is suitable for control of fat content in raw meat trimmings to avoid lean meat giveaway and batch standardisation for production of processed meat products.

**FOSS Pacific**  
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## Handheld controllers IECEx

Jay Electronique has added the Beta 2 button and Beta 6 button handheld controller units to its IECEx range. The units are also approved for use in potentially explosive gas atmospheres classified zone 0, 1, 2, or dust classified zones 20, 21, 22.

The controllers feature a backlit, anti-reflection LCD display able to indicate the battery charge level, the behaviour of the radio link, the name of the equipment being controlled remotely and feedback from the equipment such as weight of load, overload, limit switches, alarms or fault diagnostics. Navigation menus also allow users to configure the application, integrate a large number of functions or monitor a specific part of the equipment. Further customisation of logos and pictograms which appear on the screen is also available utilising the iDialog software supplied with each unit.

The emergency stop function is certified SIL 3 per EN 61508 or PLe per EN 13849 and the standard function buttons, certified to SIL2 according to EN61508 or PLd according to EN13849. Other options are available to enhance the safety of those applications that require it, such as infrared start-up, action zone limitation or validation buttons. Access to the radio remote control and certain functions can also be limited to authorised operators by password.

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## Turbidity sensor



Endress+Hauser has introduced the Turbimax CUS52D turbidity sensor for process water filtration and other industrial process turbidity conditions. The sensor performs laboratory-quality turbidity measurements without the need for extensive bypass installations, avoiding product or water losses. The sensor measures turbidity

from 0 to 4000 NTU in accordance with ISO 7027. The sensor's surface minimises the build-up of biofilms and particulates. The ability to operate at high pressures (up to 145 psi) makes suppressing air bubbles possible. For bypass operation, an optional air bubble trap catches smaller air bubbles.

The sensor is available in immersion, flow cell and in-line versions. The device can be used at the raw water inlet of any plant and the outlet of process filtration and clarification, and is suited to filter monitoring, filter backwashing and all stages of industrial water purification. The sensor is suitable for hygienic food and beverage processes including brewing, spirits, soft drink and dairy. Its fast response time (<1 s) enables it to perform as a primary process variable in control applications.

A smart solid-state reference allows the sensor to be verified and calibrated before insertion into the process without the use of potentially harmful liquid standards. Matched to each sensor for maximum calibration accuracy, the solid-state references are simple to use and provide consistent, clear results.

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Scan the QR code to see the video of the system in use.

## Rotary impingement tank and trailer cleaning machines

Gamajet E-Z8 tank and trailer cleaning machines from Spray Nozzle Engineering are designed to reduce time spent cleaning and improve tank turnaround time. The machines blast away tough residues, thereby eliminating the risk of cross contamination and the need for manual cleaning, according to the company.

The machines use rotary impingement technology that enables the machines to spin and rotate in a precise 360° indexing pattern that scours clean 100% of the tank or trailer interior.

The machines are also clog resistant and are designed to run for 800-1000 h before preventive maintenance is required.

**Spray Nozzle Engineering**

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

## Automated confectionery cooking and depositing system



Baker Perkins has upgraded its product range to enable complete automation of cooking and depositing systems for confectionery.

The upgrade involves integration of the cooking system, plus linkage to the depositing and cooling operation for total plant automation from raw ingredient weighing to cooled candy. Operators control an entire line from a single HMI that includes full process visualisation, recipe management, calibration and alarm handling.

At the cooking stage, recipe-driven controls provide full process visualisation and alarms for set-up and operation. Linking depositing and cooling to the cooking system ensures that the flow of syrup to the depositor matches the required output, minimising waste.

The system features a pressure dissolving system which can reduce the amount of water content from 23% to around 15%, as the higher pressure permits higher temperatures and increases saturation levels. With less water in the syrup, less energy is needed to evaporate it during cooking, reducing energy and water consumption.

The modular design enables installations to be configured for the exact number of colours and flavours each customer uses, with heating, recirculation and mixing options available to hold the ingredients in optimum conditions.

**Baker Perkins Inc**

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



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## 12" fanless fully sealed stainless steel panel PC

Interworld Electronics has released the AFP-6123 stainless steel all-in-one computer from Aaeon. The AFP-6123 is housed in an IP66 fanless fully sealed 316L stainless steel case with waterproof I/O connectors. The AFP-6123 is supplied with a 12" SXGA 1024x768 resolution LCD and a glass film anti-scratch USB touch screen, making it suitable for operator panel and HMI control applications.

The device features a built-in, energy-efficient Intel Atom D2550 1.86 GHz processor with up to 4 GB of DDR3 memory. A 2.5" hard drive bay and an internal CFast slot are provided for system and data storage. Rear waterproof I/O connections include: two COM ports, two USB 2.0 ports, one Gigabit Ethernet port and DC Power. The AFP-6123 can operate from a 9~30 VDC power source.

VESA 75/100 rear mounting holes allowing the panel PC to be securely wall or arm mounted.

The AFP-6123 is compatible with Windows and Linux operating systems allowing it to support for a wide range of off-the-shelf and custom-developed industrial applications. For applications requiring a larger screen resolution, the AFP-6152 with a 15" LCD is also available.

**Interworld Electronics and Computer Industries**  
[www.ieci.com.au](http://www.ieci.com.au)



## X-ray sorter for nuts and dried fruit

TOMRA Sorting Solutions' Ixus Bulk X-ray sorter implements the latest X-ray and imaging technology for the individual air-blast removal of single or embedded dense foreign materials in a bulk flow of product.

The sorter is suitable for a variety of nuts and dried fruits, including almonds, walnuts, pistachios, raisins and prunes.

According to the company, the benefits of the sorter include safety, minimised yield loss, ease of integration into existing processing lines, flexibility and high throughput.

**TOMRA Sorting Solutions Pty Ltd**  
[www.tomra.com](http://www.tomra.com)

## Temperature control systems

Unistat temperature control systems perform accurate temperature control for very small batches or for production volumes in a range of -125 to 425°C. The systems, which are available from Scitek, allow consistent scale-up in research, kilo-lab, miniplant, technology centre and in production. The range comprises more than 60 models and 200 variants with cooling powers of 0.7 to 130 kW.



The control systems may also be combined with vapour or cooling brine circuits, which make them suitable for production volumes beyond the 10 m³ class. When requirements increase, the systems can be adapted, while their mode of operation and general functionality remain the same. This gives process engineers reproducibility, process safety and stability.

A wide range of setting options allows the user to adjust the temperature control and regulation behaviour to the individual application. The systems provide efficient heat transfer with cooling speeds of several hundred Kelvin/h.

**Scitek Australia Pty Ltd**  
[www.scitek.com.au](http://www.scitek.com.au)

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# Verification and validation

**Verification and validation are critical to the maintenance of a strong food safety but verification and validation are two terms that are often confused.**

**T**o ensure that food safety is built into their processes and that problems are prevented or minimised before they occur, food companies need to:

- conduct a hazard identification and evaluation to determine what hazards need to be controlled - this includes biological, chemical (including radiological) and physical hazards,
- identify 'preventive controls' that will eliminate or significantly reduce the hazard - process controls - sanitation controls - supplier controls - allergen controls - other appropriate controls,
- determine the parameters for process controls,
- monitor the parameters,
- develop written corrective actions, and
- verify that the controls are working.

The above points are the essence of the FDA's 'food safety plan' which needs to address:

- hazards that exist,
- preventive controls that will be used to manage those hazards,
- 'instructions' describing how the preventive controls are implemented,
- the determination that things are working properly through monitoring, verification and record keeping, and
- corrective actions steps taken if something goes wrong.

In many ways, this is similar to a HACCP plan in that there are parallels between some aspects of preventive controls and HACCP. It is likely that in the food safety plan, the critical control points (CCP) of HACCP as well as operational prerequisite programs may be the preventive controls (PC) that are used to significantly minimise the levels of food safety hazards.

There are two overarching aspects of verification: one is the initial validation and the other is the evaluation that the system is performing as expected. Both of these aspects are directed at the effectiveness of the control for each significant hazard. They establish that the control is scientifically valid for controlling the hazard and verify that the control process or procedures are accomplishing the intended purpose to prevent, eliminate or significantly reduce the likelihood of the hazard.

There has been quite a bit of confusion in the past about verification and validations, especially since the US National Advisory Commission on Microbiological Criteria for Foods (NACMCF) definition for verification includes validation and excludes monitoring, and the Codex definition includes monitoring and does not specifically mention validation.

## Validation

Validation is the initial determination that the controls are scientifically and technically sound to prevent the hazard. This initial validation will answer the question, "How do I





know that what I'm doing is working so that I have achieved the reduction in the hazard that I've specified achieve (for example, 100% inspection for metal greater than 4 mm in size)?" The information to support the initial validation can be peer-reviewed public literature, regulatory guidance, trade association publications, a manufacturer's technical information, company knowledge and initial in-plant data collection. Validation happens prior to putting the control or the plan into place.

### Verification

Verification involves evaluating that all hazards, as determined by a hazard analysis to be significant, have been identified and determining that if the food safety plan is properly implemented these hazards will be effectively controlled. Another aspect of verification is evaluating whether the facility's HACCP system is functioning according to the HACCP plan - in other words, "Am I doing what I say I've said I am going to do in the plan?"

Verification is a critical component of a food safety plan, because it demonstrates that you're keeping tabs on your food safety system.

The five components of verification

1. Validation - the scientific determination that a process works.
2. Verifying that monitoring is occurring - observing the generation of monitoring records or having a supervisor or other individual repeat a measurement.
3. Verifying that corrective actions are occurring - every single preventive control needs an associated set of corrective actions written in the food safety plan including short-term corrective action and root cause analysis. The food safety plan should also specify how the facility will react in the event of an unanticipated hazard.
4. Verification of implementation and effectiveness of pre-

ventive controls - a qualified individual needs to oversee calibration and records review.


5. Testing can be used as verification. Environmental testing can be used to verify sanitation efforts to assist in reduction of the potential environment cross-contamination. Also, similarly finished product testing can be used to verify process controls.

### Reanalysis

Food safety plans must be reanalysed at least once every three years. There are several other things that can trigger a reanalysis sooner than the three years:

- Unanticipated hazard and subsequent ad hoc corrective actions.
- Significant change (a change in formulation, process, etc).
- Identification or awareness of a new significant hazard.
- If a preventive control is found to be ineffective.

Verification is one step to help ensure the food safety system is working to prevent, control or significantly reduce public health hazards. Verification includes validating the steps to ensure the process will work, and secondly, includes the evaluation activities that verify the system continues to work. Verification activities are clearly defined in the FDA's proposed Preventive Controls rule, as well as in current regulated HACCP requirements.

The Thermo Scientific/The Acheson Group white paper, 'Verification: Can your food safety plan meet the rigors of FSMA's proposed preventative controls?', gives extensive examples of the prerequisite programs and preventive controls food manufacturers can use to control or reduce food safety risks resulting from foreign material contamination. The white paper can be accessed at: [www.thermoscientific.com/content/dam/tfs/ATG/CAD/CAD%20Marketing%20Material/CAD%20Marketing%20Documents/M&M%20Documents/Acheson\\_Group\\_inbooth.pdf](http://www.thermoscientific.com/content/dam/tfs/ATG/CAD/CAD%20Marketing%20Material/CAD%20Marketing%20Documents/M&M%20Documents/Acheson_Group_inbooth.pdf). 

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## Washdown hose reel with rewind speed control

Reel Tech offers a washdown system for the food and beverage industry. At the heart of the system is Reel Tech's stainless steel Safe-R-Reel rewind speed control system, designed and made in Australia.

The Reel Tech washdown system reduces the chance of employee and equipment damage due to excessive hose 'speed whip' during rewind, which is a common problem with spring hose reels. The Safe-R-Reel can be optioned in full stainless steel that is chemically resistant, robust, durable and offers a high level of safety. Users can add a Smart Approved WaterMark trigger nozzle washdown gun to complete their washdown solution.

The Safe-R-Reel is simple to install, depending on the reel capacity, as the system simply bolts on to the hose reel canister, and it can be tuned to achieve 30-50% speed reduction compared to a standard spring rewind reel. This can also be upgraded to vary the rewind speed.

The system does not rely on hydraulic clutching or other dependent devices requiring regular service and contains no visible moving parts.

The Safe-R-Reel reduces trip hazards, ensures safe rewind speeds, extends hose life, reduces washdown time and saves water.

### Spray Nozzle Engineering

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



## X-ray system

LOMA has launched the X5 Pack X-ray System, for the detection of foreign contaminants in the food and packaging industry. Featuring Adaptive Array Technology (AAT), detection performance has been improved by up to 25%, according to the company.

Significant design enhancements include the removal of flat surfaces to improve hygiene, easy belt removal, increased sensitivity and improved thermal management. The system includes an intuitive touch-screen, X-ray generator design featuring an 18 W eco mode and a high-efficiency heat exchanger for extended X-ray tube life.

The system is available in 300, 500 and 600 mm belt widths.

### Inspection Systems Pty Ltd

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

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Spraying Systems has an array of hand-held spray guns that provide the necessary clean needed in order to maintain critical health and safety requirements.

The GunJet® CU150A-316 in stainless steel is ideal for clean-up and sanitation in food and dairy processing operations and is suitable for internal or external use. Options range from a gentle low-pressure spray to a high-impact solid stream.

GunJet® spray guns are also available in brass and aluminium which is suited for general plant and equipment clean-up.

### Features:

- Ergonomically designed handles improve control and reduce operator fatigue
- Spray pattern can be easily adjusted from a solid stream to a 50° hollow cone spray pattern by varying trigger pull
- Optional swivel connector with ring to lock trigger in spraying position



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## Gloss-finish, aliphatic PU flooring topcoat

Flowfresh FCUV from Flowcrete Australia is a gloss-finish, fully aliphatic polyurethane screed topcoat.

Aliphatic polyurethane screeds are based on aliphatic isocyanates and mostly polyester and/or acrylic polyols. The term 'aliphatic' means open-chain (non-cyclic) hydrocarbons, and it can also apply to open-chain hydrocarbon subunits of larger organic molecules.

Aliphatic polyurethanes are known for their enhanced strength, colour stability and increased resistance to UV degradation. Aliphatic polyurethanes are installed as a thick film and will flow slowly in temperatures above 10°C.

The topcoat is available in a range of colours and comes with an easy-to-clean, high-gloss finish. The material also includes Polygiene, a silver-ion based antimicrobial additive that inhibits the growth and spread of bacteria on the surface of the floor.

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



## Double-ball lollipop depositor

Baker Perkins has developed one-shot technology for depositing double-ball lollipops on its ServoForm range of depositors.

Existing depositing systems can be simply adapted to produce double-ball products by fitting new sets of moulds. The range of product options includes: up to four colours, centre-fillings, stripes, layers, inclusions, sugar-free and sugar options.

More innovative choices are created by the application of existing 'short-term' and 'long-term' layering capabilities. To produce short-term layered candy the second layer is deposited immediately after the first layer. Long-term layered candy requires a depositor with two depositing heads spaced apart and involves a dwell time between each deposit, allowing the first level to partially set before the next one is deposited, and enabling each layer to involve different colours, flavours, patterns or fillings.

According to the company, depositing offers good quality and production flexibility, with superior appearance, high clarity and rapid flavour release with a smooth mouthfeel being key quality advantages. The nature of the depositing process also leads to extremely high-dimensional shape and weight accuracy, negligible scrap rates and efficient wrapping, good hygiene and low maintenance.

**Baker Perkins**  
[www.bakerperkins.com](http://www.bakerperkins.com)



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## Safety switch for gates, covers and flaps

Pilz has released a Slimline version of its PSEN code safety switch which is suitable for assembly on gates, covers and flaps.

Coded safety switches PSENcode are used to monitor the position of guards and also for general position monitoring. The PSEN-code range has been extended by the addition of a version in slimline design. In comparison with the compact design it has very low profile housing (13 mm height) at the same width.

Thanks to RFID transponder technology, the coded safety switches PSENcode combine maximum manipulation protection with a very small space requirement.

The latest member of the PSENcode range also enables installation on gates, covers or flaps in up to four actuation and approach directions and two different operating distances each. Thanks to its versatility, PSENcode offers design engineers a high degree of freedom when designing the machine to Cat 4 or PL e. So it is also possible to implement applications that were previously only realised using magnetic safety switches. The Slimline Safety switches also come with a range of options such as a variety of operating ranges, a magnetic latching system that has a residual holding force and ensures the doors close exactly as positioned every time as well as a variety of indication and diagnostic functions.

**Pilz Australia Industrial Automation LP**  
[www.pilz.com.au](http://www.pilz.com.au)







### Upgraded sealing profile chart

Oz Seals has released an upgraded version of its profile chart, which includes improvements in advanced sealing technology. The full-colour chart includes the standard range from its SealNet division and includes over 300 profiles.

**Oz Seals**

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



### Intelligent tank cleaning rotary jet head

The Gamajet Rotacheck is designed to validate the rotary impingement cleaning process inside sanitary tanks. Built on patented technology and mechanical design, the Rotacheck stores time and pressure data, automatically calculating the cleaning process's feedback.

Whenever any deviation from the original rotation or impact pattern is detected, it automatically sends an error signal, enabling the control system as well as the operator to take remedial action to restore optimal operation. This ensures secure online monitoring of tank cleaning operations at the plant at all times.

With Gamajet Rotacheck, plant operators and maintenance staff can easily monitor and verify proper rotary jet head function as well as safe and efficient tank cleaning operations. The Rotacheck system may also be used with purified water and water for injection as well as in systems that are pressurised during CIP.

Designed for use in all types of hygienic tanks, it is approved to carry the 3-A symbol and the European Hygienic Engineering & Design Group (EHEDG) symbol. It is available in both built-in and retrofit options. The Gamajet tank cleaning system minimises microbiological build-up and ensures a fully flushable process connection.

**Spray Nozzle Engineering**

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





## Look what we have for you!

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# Competitive meal delivery with a conscience

## Achieving automation in a social enterprise

**Producing 3000 meals a day and 850,000 meals a year when around 80% of your workers have a disability is truly an achievement of which to be proud.**

**T**his is the scenario at Flagstaff's Fine Food Division, which has numerous Meals on Wheels contracts, two retail outlets and individual customers from around its central location near Wollongong, NSW; its site in Nowra, on NSW's south coast; and further afield.

All the meals are prepared fresh then snap frozen. Two freezer trucks and one freezer van are on the road five days a week, delivering to customers as far away as southern Queensland, Canberra and Dubbo.

The Flagstaff Group is a social enterprise with a primary purpose "to enhance the lives of people with disabilities by building skills and capabilities that facilitate independence through choice of authentic and meaningful employment in a sustainable business environment".

In addition to its food division, which also operates a training cafe, it runs businesses that include laundry services, recycling, packaging and assembly, document scanning, coffee roasting, glove recycling and rural fencing. Across the entire group of around 370 employees, 80% have a disability and receive the Disability Support Pension.

With Flagstaff required to compete commercially, Flagstaff Group Sales and Marketing Communications Manager Karen Burdett said that ways to increase productivity are always being considered, but not at the expense of eliminating jobs.

### Automated packaging

"To this end, around four years ago our Fine Food Division made the decision to add some automation in the meals production area. As this division employs 60 people, 53 of whom have a disability, we needed to make sure that the machinery we installed was easy to operate," Burdett said.

"We transitioned from our old packaging method of aluminium trays with cardboard lids to a Confoil automated heat sealing machine, which provided many benefits for our customers."

Two Oliver 1808 sealing machines were installed and Flagstaff decided to use Confoil's Dualpak trays, which are made from pulp paperboard with a polyester film lining that provides a liquid-proof barrier. The machines apply the lidding from continuous film rolls.

Flagstaff opted for the 360 and 500 g trays with dual cavities so that the protein and vegetable components can be separated.

### Many benefits

"Back then, our Meals on Wheels clients almost comprised our total customer base and they were especially appreciative of this packaging change. Now we have many individuals who use our nutritionally balanced meals for convenience and everyone can take advantage of the packaging benefits."





*We need to have a machine that is easy to operate and allows us to train our employees quickly.*



These benefits include:

- Tamper-evident lids for greater food quality and safety.
- Lidding that is easy to open, thanks in part to the large film overhang.
- The ability to take trays from the freezer to the microwave and conventional oven.
- The meal can be seen through the clear lid.
- Better heat retention, yet the trays can be comfortably handled when hot.
- The tray and film lidding can be recycled, which is an important factor for environmentally conscious Flagstaff.

“While we recommend plating the meal for a more enjoyable experience, we are fully aware that a lot of consumers eat straight from the tray, which is not unattractive. Being able to microwave the meal is one of the biggest benefits for our older consumers as it is much safer than using an oven or stovetop.

“In terms of food quality, the film lidding enables all the steam to be kept in and retained in the heating process. This is really important in making sure the meal reaches the appropriate temperature, retains its moisture and doesn’t leak during the heating process.”

### **Simplicity and ease of use**

A key reason for Flagstaff choosing Confoil’s Oliver system was because of the simplicity of using the machine. “We need to have a machine that is easy to operate and allows us to train

our employees quickly. Quite a few of our employees only work one or two days a week so it has to be intuitive, and many have a mix of skills, which allows us to ensure we always have sufficient people in the production area to operate the machine,” Burdett said. Last year Flagstaff took advantage of the ability to customise the trays with its own logo and design, which allowed it to promote its brand on the packaging.

“It’s good for us to be able to promote Flagstaff Fine Foods through our logo and reinforce our brand to customers and consumers of our meals. Confoil arranged this without any fuss and it was completed very efficiently.” The two Oliver sealing machines are located within the production kitchen. After the meals are prepared, staff manually portion the trays and they are placed onto the machine’s tray carriage for the lidding and sealing process. The sealed meals are then manually placed into racks for snap-freezing and dispatch. The Oliver 1808 is capable of processing 27 trays/minute or 800 meals/day with the output variable according to the settings and speed of the machine.

“Since we’ve been using the Oliver system, we have greatly improved productivity, which has resulted in reduced overheads and helped make us more competitive. Savings are also made through using a tray with dual cavities as this provides us with better portion control and reduced wastage. It’s just so simple now and extremely efficient,” Burdett added.



Confoil Containers  
[www.confoil.com.au](http://www.confoil.com.au)

## RFID safety sensor

Utilising wear-free RFID technology, the RSS16 safety sensor by Schmersal is a solution to overcome limitations of electromechanical devices. The sensor gives users the option of three levels of protection against defeat. The basic version will accept any actuator of the RSS family. Secondly, users can teach an actuator to work with the one device; teaching can be repeated any number of times with a delay time between teaching cycles. The third and highest level of tamper resistance will only accept the actuator presented at the very first power up of the device.

Additional benefits include the possibility to approach the device from three sides, providing a high level of flexibility when integrating into the surrounding construction. Cost effective and robust, the safety sensor can be used as a magnetic door stop and latch up to 60 N, allowing the designer to forego the use of a separate stop and latching device. Users can connect up to 31 RSS16 devices in series monitored by a single safety module, all while maintaining CAT4 or PLe.

**Control Logic Pty Ltd**

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

## High-pressure sensors for cylinder applications

TURCK is extending the CRS series with the introduction of high-pressure inductive sensors. The sensors are suitable for cylinders with an operating pressure rating of 3000 psi, whereas the previous models allowed for only 1500 psi. The sensor series comes with embedded LEDs, providing an easily visible indication of the sensor.



The high operating pressure CRS is equipped with a 7/8" male connector, measures 12.7 mm in diameter and has a stainless steel smooth barrel housing with a special high-pressure sealing ceramic active face, which allows it to withstand high pressure and demanding applications. The sensors are available in six probe lengths varying from 23.2 to 95.9 mm, with other lengths available upon request. The series is IP67 rated and has an operating range of -25 to 70°C. The sensors are equipped with 2-wire AC/DC, allowing for easy adaptation to existing systems. A 3-wire PNP version is also available.

**Turck Australia Pty Ltd**

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

## High-temperature infrared thermal image camera

The Flir T390 is a lightweight, high-temperature infrared thermal image camera. The camera, which is available to rent from TechRentals, has a range of -20 to 1200°C and is suitable for almost any thermal imaging application. The camera can be used for electrical surveys, building diagnostics and mechanical inspections. With a refresh rate of 50 Hz PAL and laser locator, the camera is suitable for inspecting moving targets. The camera features a 3.5" colour touchscreen, auto and manual focus, target illuminator and voice/text annotation, as well as a 3.1 MP visual light camera to complement the 320 x 240 thermal images. Other features include: picture-in-picture overlay; panoramic image stitching; automated periodic frame capture options with intervals from 10 s to 24 h; USB connection allowing for 16-bit radiometric infrared image streaming to PC.



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# Detecting and destroying norovirus

Norovirus, the most common cause of viral gastroenteritis in humans, is claimed to affect around 267 million people worldwide and cause over 200,000 deaths annually.

**D**epending on the surface and temperature conditions, the virus can survive for long periods outside a human host. It can still be viable after weeks on hard surfaces and up to 12 days on contaminated fabrics, and it can survive for months - maybe even years - in contaminated still water. A study done in 2006 found the virus still on several surfaces used for food preparation seven days after contamination.

Norovirus particles can cause illness even in relatively small numbers, estimated at perhaps as few as 10. The virus is transmitted by faeces-contaminated food or water, by person-to-person contact and via aerosolisation of the virus and subsequent contamination of surfaces.

Handling is the usual source of contamination for most foods. However, shellfish are most commonly contaminated by faeces-polluted water in the harvest area. Oysters, clams, mussels and cockles feed by filtering out particles in the water through their gills and diverting the particles to their mouths and digestive tracts. Bivalves can bio-concentrate viruses within their edible tissues to many times the levels in the surrounding water. This makes raw shellfish susceptible to high levels of norovirus contamination when the water is polluted.

Processing interventions that can be used to minimise the likelihood of norovirus contamination in molluscs can include washing all outer surfaces, pasteurisation or cooking, depuration, high-pressure processing and irradiation.

Now, a research team at the German Cancer Research Center (DKFZ) has produced 'nanobodies' that could be used to better

characterise the structural makeup of the virus. They discovered that these nanobodies could detect the virus in clinical stool samples and disassemble intact norovirus particles. Such nanobodies may potentially be used to not only better detect but also treat symptoms of norovirus infection in the clinic.

Infection with highly contagious noroviruses, while not usually fatal, can lead to a slew of unpleasant symptoms such as excessive vomiting and diarrhoea. Current treatment options are limited to rehydration of the patient.

"Additionally, noroviruses come in a variety of constantly evolving strains. This makes the development of an effective vaccine to protect against infection, as well as antiviral therapy to combat already-existing infections, particularly challenging," said Dr Grant Hansman, a virologist who leads the CHS Research Group on Noroviruses at DKFZ and Heidelberg University.

Hansman's research team recently discovered that a nanobody called Nano-85 was able to bind to intact norovirus-like particles (VLPs) in culture. Nanobodies are very similar to antibodies, which recognise and bind to antigens. "However, nanobodies are much smaller, more stable, easier to produce and [more] cost-effective than traditional monoclonal antibodies," said Hansman. Interestingly, Nano-85 was able to recognise the VLPs from a variety of different norovirus strains.

The researchers then tested the nanobody on stool samples from patients infected with the virus. In this context, Nano-85 was able to detect the virus in one third of the samples already known to be positive for noroviral RNA. "Because noroviruses are changing all the time, there is a need for



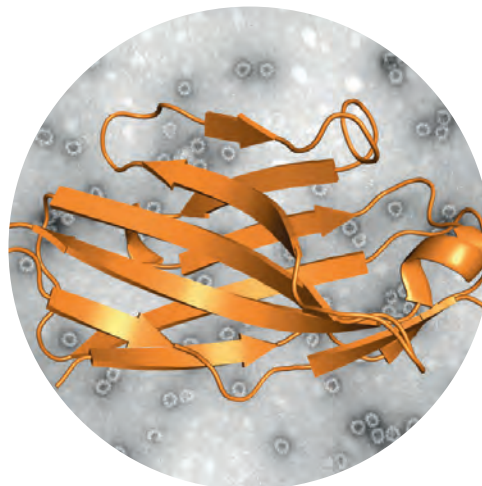


more powerful tools to detect emerging noroviruses. We still need to optimise detection using Nano-85, but we hope that it could potentially be used as a diagnostic tool further on down the road," explained Hansman.

In solution, Nano-85 was also able to bind to a specific portion of the VLP known as the protruding (P) domain. As with the VLPs, Nano-85 recognised the P domains from a variety of strains. Hansman describes the P domain as a structure that "essentially sticks out like a spike from the virus. Therefore, it has some degree of flexibility - like grass on a hill on a windy day. This ability to change shape likely allows the virus to evade recognition by the immune system - but could also make it more vulnerable to attack."


Using X-ray crystallography, the researchers were able to determine the shape and molecular components of the Nano-85/P domain complex, as well as specific sites where Nano-85 and the P domain formed bonds. According to Hansman "this is, as far as we know, the first instance in which the molecular structure of a nanobody-P domain complex has been determined for norovirus".

Interestingly, the investigators found that the site where Nano-85 bound to the P domain was actually hidden under the viral particle's surface. "From the virus's point of view, this could be a strategy to keep potentially vulnerable sites protected from attack," explained Hansman. However, when they tried to create high-magnification images of the interac-



*Electron micrograph of norovirus virus-like particles (VLPs) and a cartoon representation of a nanobody, termed Nano-85 (orange). Nano-85 binds to the VLPs and causes the VLPs to disassemble. © Dr Grant Hansman, DKFZ.*

tion using electron microscopy, they were surprised that they could not find any intact VLPs. This led them to believe that Nano-85 itself was actually causing the VLPs to break apart.

In describing the significance of these findings, Hansman said: "If Nano-85 is indeed causing intact VLPs to disassemble, this could be a very promising lead in developing norovirus antiviral therapy. This could be especially beneficial to immunosuppressed individuals such as cancer patients. Administering a vaccine to protect against infection would overwhelm the patient's immune system. However, if he or she has the option of receiving an antiviral to eliminate the infection, the norovirus becomes much less dangerous." 



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## Serial Dilution System for viable cell count determination

Inlabtec has introduced its Serial Dilution System to Australia. The system automates the traditionally labour-intensive process of serial dilution and replaces glass tubes with single-use sterile bags.

The Inlabtec Serial Dilution System consists of a dispenser unit and a bag holder for handling the serial dilution bags. Safe and comfortable pipetting prevents mistakes and there is no cumbersome handling of caps during pipetting, no physical stress due to manual sample vortexing and no time-consuming preparation of dilution tubes.

The system offers better data quality thanks to standardised dilution process and a short payback time for labs currently processing 100+ dilution tubes daily.

This two-minute video shows how the Serial Dilution System works.

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## Optical measurement of oxygen in packaging

Witt Oxyspot is equipped with an optical sensor which measures the concentration of oxygen in rigid or flexible packaging.

The sensor has an accuracy of  $\pm 1\%$  in the measurement range of 0-5% oxygen or  $\pm 2\%$  in the measurement range of 5-25% oxygen.

The measurement is effected using the principle of optical fluorescence and comprises three components: an LED, a dye carrier (dot) and a photodiode. The dot is stimulated by the LED. The colour layer absorbs the light energy and emits this again with a time lag. The photodiode determines the oxygen concentration from the emitted light energy.

Three Oxyspot versions are available - dot, needle and line - which cover a broad application field, including non-destructive analysis for long-term observation; random sample analysis of small-volume packaging; and continuous in-line monitoring of packing processes.

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## Mini bead mill homogeniser

The BR4 Mini Bead Mill Homogeniser from Omni offers fast and reproducible nucleic acid and protein extraction with minimal costs and minimal footprint. The system can process up to four samples simultaneously (0.5, 1.5 or 2.0 mL tubes), with easy-loading snap-in tube holders, at speeds ranging from gentle mixing to high-force homogenising. A one-place holder for 7 mL tubes (up to 6 mL sample) is also supplied. The homogeniser is easy to use, with 5 preset speeds and a timer ranging from 1 s to 5 min. Loading is simple: lift the lid and snap the tubes in place, close the lid, press the button. A magnetic lock on the lid ensures the machine cannot run with the lid open.

The BR4 efficiently lyses human, animal and plant tissues and microorganisms, including bone and tooth samples, with a wide range of prefilled bead kits. The homogeniser requires minimal bench space as the footprint is the same as an A4 sheet of paper.

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## Wet chemical analyser for process lines

Metrohm has developed the ADI 2045TI wet chemical analyser for process lines that can perform almost every online wet chemical analysis even in difficult environments.

The analyser can be configured for various applications and has a range of modules including burettes, pumps, vessels, valves, loops and digester. The control software allows the user to program sequences of methods, set conditions and alarms, and to manually control the analysers. The results are displayed numerically as well as graphically and all results are stored in a database.

The system can be programmed for one or more of the following methods: titration for a broad range of applications; Karl Fischer titration for water determination in liquid streams (oil, solvents, glycol, etc); colorimetry for water quality analysis and various process solutions; dynamic standard addition for ion specific analysis that uses ion selective electrodes; direct measurement for measuring physical parameters such as pH, conductivity and temperature.

The user is able to choose a combination of methods, which in some cases will enable a single analyser to fulfil all analysis requirements. There is also the option for simultaneous analysis to increase response times.

**MEP Instruments Pty Limited**

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## GC and GC-MS applications notebook for food safety analysis

Thermo Scientific has released a GC and GC-MS applications notebook for food safety analysis. The downloadable resource contains a comprehensive collection of applications for GC and GC-MS analysts involved in food safety and quality analysis.

From details on the determination of pesticides in challenging matrices such as oysters and Ayurvedic churna, to nitrosamines in beer and fatty acids in edible oils, the notebook covers more than 25 different applications.

Sample preparation (QuEChERS, accelerated solvent extraction, SPE), GC-FID, GC-Headspace, GC-MS and GC-MS/MS are featured in the various example workflows. Topics covered include pesticide analysis; packaging contaminants; other contaminants; natural compounds and food additives; GC-and GC-MS technology.

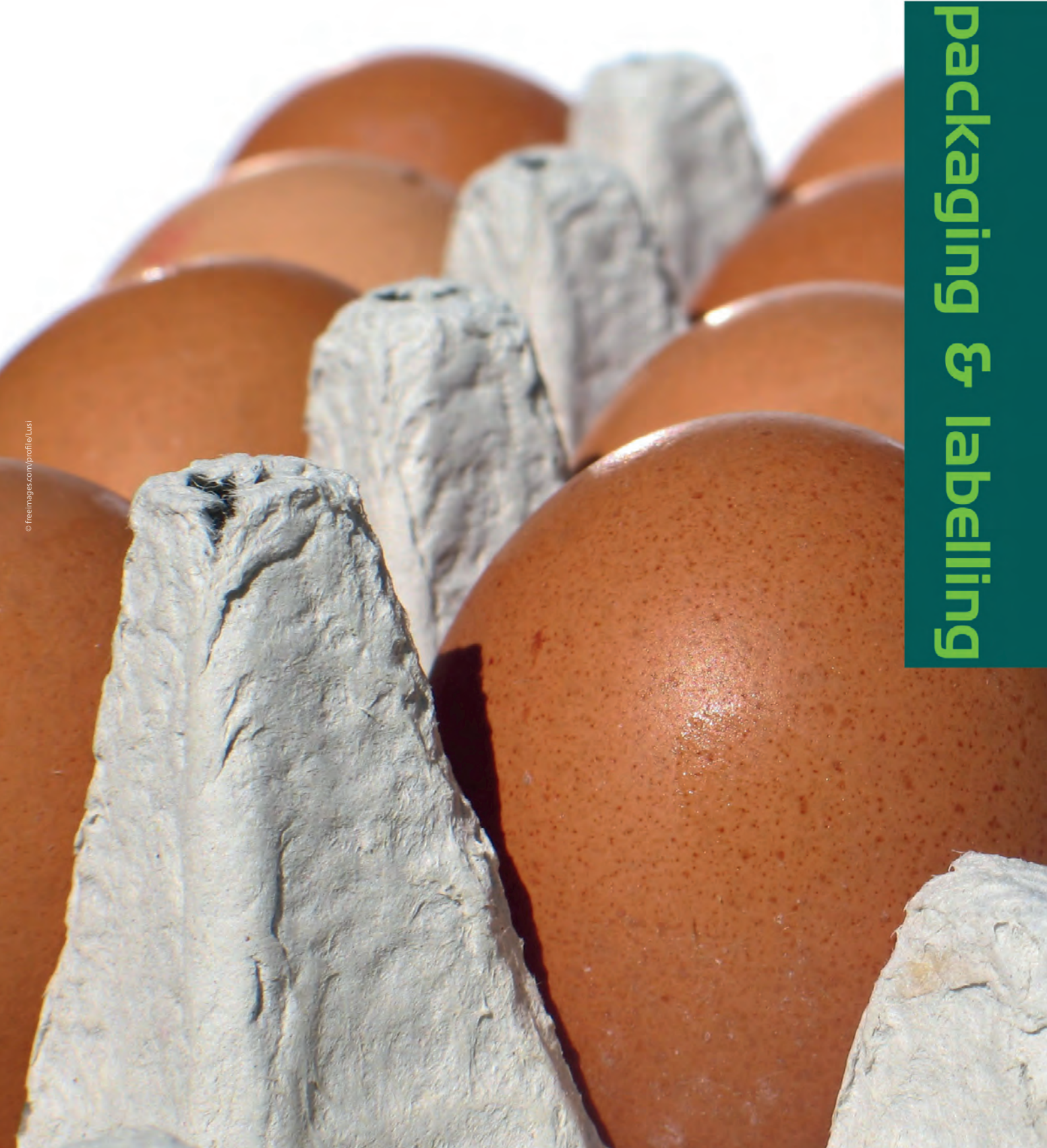
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# packaging & labelling







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# Frozen berries scare

propels traceability to top of the food safety menu

Food safety today is taking centre stage with the spotlight clearly beaming down on the need for an unequivocal, standard practice across the entire food sector.

**T**he recent 2015 frozen berries case is not the first food safety incident of its kind and it won't be the last. According to the Australian Competition and Consumer Commission (ACCC) Product Safety Recalls Australia website, there were 75 recalls of food and grocery items in 2014 alone.

The latest incident was preceded by other high-profile cases including the Hepatitis A outbreak allegedly linked to semi-dried tomatoes in Australia in 2009, and the contamination scare that triggered a recall of Fonterra products that may have contained whey protein in a number of countries around the world, including China and Australia, in 2013.

Initial detection of the cause of a foodborne virus outbreak or food contamination is clearly an issue for the food regulators to review and address as part of the Food Standards Code.

According to FoodLegal, experts in Australian and international food law, "It appears that little has been done to improve the situation for preventing an outbreak of food-born Hepatitis A in foods in Australia in the period from the last major outbreak, which occurred in 2009, until the latest outbreak in 2015."<sup>1</sup>

These food safety incidents have also identified an inherent gap in the current traceability systems we have in the Australian food chain today. To help prevent these food contamination outbreaks from reoccurring in the interests of public health and safety, we need to examine the learnings from these incidents and explore the opportunities for improving traceability and supply chain visibility.

## Product visibility and traceability through the supply chain

Following the Government Inquiry into the Whey Protein Concentrate Contamination Incident involving Fonterra, The Dairy Traceability Working Group was established in New Zealand.

Recent reports released by the Dairy Traceability Working Group outline the most appropriate regulatory provision for the traceability of dairy products and the development of a code of practice to guide the dairy industry in implementing these requirements.

It is important to note that recommendations of the working group will also be considered for all food sectors, not just dairy. The Working Group's proposed regulatory requirements include:

- End-to-end traceability from farm to consumer using the 'one up, one down' system (tracing back where product has come from and tracking forward where product has gone), with particular reference to participants in the supply chain having access to Recallnet - the voluntary product recall online portal administered by GS1.
- Future consideration of implementing EPCIS (EPC Information Services) - a GS1 standard that enables trading partners to share information about the physical movement and status of products as they travel through the supply chain from business to business and ultimately to the consumer. EPCIS is an international tool that enables seamless end-to-end traceability.





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## GS1 standards to protect the Australian food chain

To protect the security of the Australian food chain and the safety of consumers, the implementation of GS1 standards will allow for better visibility of product, up and down the supply chain at all times. By using GS1 standards, the recalled products will be able to be traced quickly and efficiently back to the source of origin.

Traceability is all about tracking any food through all stages of the supply chain from the source of raw materials, additives and other ingredients through to production, processing, packaging and distribution, including importation and retail.

Effective traceability enables food businesses to specifically target the product(s) affected by a food safety problem, thereby minimising disruption to trade and reducing potential public health risks.

GS1 standards exist today to encode data such as batch/lot numbers, use-by and best before dates and other product attributes at all levels of packaging from bulk materials to single produce items and finished goods.

## Recall communication plan

Traceability is an important part of an organisation's product recall management plan.

"Not having effective traceability processes can often lead to delays in actioning a product recall. This is one of the leading causes of incidents escalating into a crisis," said Maria Palazzolo, chief executive officer at GS1 Australia.

"The ability for a company to successfully track and trace their products through their supply chain and retrieve them from the marketplace is a key component to protecting the safety of the consumer and protecting the brand."

The speed and effectiveness with which a recall is communicated to retailers and government authorities has implications for not only consumer safety, but a firm's business reputation.

A detailed and well-thought-out recall communication plan is therefore an essential business tool for any company.

With GS1 Australia's Recallnet, issuing a recall or withdrawal notification is simple, fast and inexpensive. Recallnet is a centralised online portal designed to streamline the management of product recall and withdrawal notifications. Distribution of a recall using Recallnet facilitates significant improvement in the speed of notification to stakeholders.

Based on global GS1 standards and best practices, Recallnet simplifies and automates the exchange of information between suppliers, distributors and retailers as well as government agencies such as FSANZ and the ACCC.

## Implementing GS1 standards

Technologies including barcodes capable of encoding and capturing much more than a single product identifier through all points in a supply chain, allowing for greater product traceability, have been in existence since 2005 but have not been adopted by industry.

*Traceability is an important part of an organisation's product recall management plan.*

Thirty-six years ago, Australian retailers adopted the GS1 System of barcoding and numbering as their preferred standard for trade.

GS1 Australia will coordinate a working group with industry support to discuss the adoption of traceability technologies to identify the costs and benefits to brand owners and the industry, and develop a road map for implementation.

"GS1 Australia has assisted Australian food and beverage businesses in improving their ability to track and trace their products up and down their supply chains by implementing GS1 standards," added Palazzolo.

"We work towards helping industry create a seamless supply chain, allowing Australian companies to adopt world's best practice supply chain management techniques."

## GS1 DataBar - the one little thing that will have a big impact

GS1 DataBar is a new family of barcodes that are an open, global standard, just like existing EAN/UPC barcodes. They have a huge potential to transform the way

retailers do business as they carry more information than the current GS1 retail point-of-sale (POS) barcodes. They can be used on small, hard-to-mark consumer products and fresh produce, enabling a piece of fruit to be scanned instead of being looked up on the system. In the instance of the recent frozen berries scare - if the finished product had been barcoded with a GS1 DataBar, the product recall could have been much more efficient as it would have provided greater visibility about which consumers had purchased the product and which retail outlet had a particular batch that may have been contaminated.

For fresh produce, GS1 Australia and GS1 New Zealand are currently working with the Produce Marketing Association Australia-New Zealand (PMA A-NZ) to develop a roadmap for the implementation of a more effective produce identification and traceability system, including GS1 DataBar, for produce sold as loose or in bulk.

Australian retailers began a process of upgrading their store scanning systems to accommodate GS1 DataBar in 2006. Unfortunately, other priorities have pushed ahead of implementing this capability across their networks.

## Need more information?

If you require some assistance implementing traceability and recall improvements as part of your supply chain process, GS1 Australia can assist you with putting these processes in place.


To find out more about traceability and recall improvements, Recallnet and GS1 DataBar, contact GS1 Australia on 1300 BAR-CODE (1300 227 263), visit our website, email [gs1databar@gs1au.org](mailto:gs1databar@gs1au.org) or [gs1recallnetadmin@gs1au.org](mailto:gs1recallnetadmin@gs1au.org) to speak to one of our experts.

'Source: 'Hepatitis A and food testing: What lessons were learned by governments from last time?', 10 March 2015.

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## The ubiquitous can

One of the most intriguing features in the history of packaging has been the use of metal, the most striking application being that of the food can.



At a time when plastic materials have been used in every conceivable format, the can has kept its place as a reliable and trustworthy pack and retained the confidence of consumers.

The history of canmaking and canning processes has been well documented and progress has been visible to consumers: two-piece cans with easy-open ends, shaped cans and new decoration techniques. Research and development, however, is not only concerned with improving marketability but also with improvements to manufacturing operations.

In the case of the hermetically sealed can, the process of drawing the metal body was a significant step forward. The double seam (invented by Max Ams in 1896) should also receive attention. Over many years the assessment of the double seam has involved some mechanical operations to measure and assess seam quality.

Inevitably, the 'tearing down of seams' has the potential to cause some distortion to the metal. While this has been carried out skillfully and produced results which give confidence that a satisfactory hermetic seam has been formed, it is still a destructive process. However, the process of 'seam teardown' can now be replaced by a static examination using X-rays. Developed by CMC KUHNKE, the SEAMSCAN XTS X-RAY tightness scanner provides a 'virtual teardown' of the seam to give detailed measurement for the seam components - even including wrinkle amplitude. The expansion of new techniques of quality assessment has provided new insights into measuring performance requirements.

While there has been a significant improvement in facilitating seam assessment and other attributes, there have been concomitant developments in the formation of the double seam with attention being directed to the profiles of the seaming rollers and the precision with which they carry out their function. This has facilitated an increase in can manufacturing speeds (ie, 450 cpm) with the consequence that routine maintenance requirements have become more demanding. In 2012, Swiss company Ferrum announced a new development in machine monitoring. A small device added to its can seamers allows access to the can seamer at any time, enabling the company to advise the customer with respect to performance etc, and draw attention to service requirements. Currently the new system - ferruTell - can provide up to 60 machine parameters. The canning industry has a proud record extending over 100 years. Consumers can have confidence in the canning industry secure in the knowledge of its safety record.



Harry Lovell OAM, FAIP, Emeritus Professor  
Australian Institute of Packaging (AIP)  
info@aipack.com.au www.aipack.com.au

## Flexible package leak tester

The SealTick TSE6086B leak testing system from Bestech Australia has been developed to enable testing of seals in food and pharmaceutical packages. It works on the principle of vacuum decay, where a pressure difference will generate a leak flow from higher pressure to lower pressure. A testing package is rapidly placed under a vacuum and then isolated, so that any leaks allow a return to atmospheric pressure.

The test is dry, clean and objective, simple to operate, rapid (5-15 s) and highly sensitive. It is effective and safe even when the product protrudes and is non-destructive, so the product goes straight back on the packing line.

The system's stainless steel construction is suitable for a production environment and it accepts a wide range of pack sizes and shapes without adjustment. The test results shown on lamps - pass; fine fail; coarse fail - and displays the quantitative result on a backlit display.

The test includes 20 nameable methods and has a memory capacity for 30 days of results (1 file/day). The Ethernet connection allows periodic upload for mandatory record keeping and trend identification, plus online monitoring via web browser. Test parameters are stored and accessible under password access and the setting and control of test times and parameters is done from the keyboard.

The test vacuum is internally generated from compressed air with a high resolution measurement of leak rate. The system accepts items up to 360 x 300 mm (depending on thickness).

**Bestech Australia Pty Ltd**

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## Time-of-flight laser sensor

The OsiSense XUK-T time-of-flight (TOF) laser sensor from Schneider Electric is claimed to precisely measure distance by using light velocity, allowing precise positioning and high accuracy for packaging conveyor lines and material handling applications.

The compact sensor features analog (4-20 mA, 0-10 V) and digital (PNP or NPN) outputs; laser photoelectric sensor up to 70 m depending on model; IP67, IP69K degree of protection; background suppression mode for distance measurement control; reflex mode for anti-collision and tandem mode.

**Schneider Electric**

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## ALDI ditches cans for cartons for organic vegies

ALDI Sud has bypassed traditional metal cans, opting to package an organic vegetable range in combisafe cartons.

The cartons, made by SIG Combibloc, offer comparable product protection and shelf life to cans, but have greater environmental benefits.

"In a life-cycle assessment conducted by the Institute for Energy and Environmental Research (IFEU), it was demonstrated that in the line-up against food metal cans, glass jars, plastic stand-up pouches and plastic pots, the carton pack has the best environmental performance. Compared to other packaging solutions for long-life foods, using combisafe can reduce CO<sub>2</sub> emissions by up to 54% and the consumption of fossil resources by up to 59%," said Volker Bubacz, head of area marketing Europe at SIG Combibloc.

The cartons are promoted for their suitability for chunky foods and those that do not flow freely and therefore cannot pass through a pumping system and an aseptic process. ALDI Sud has selected combisafe 300 mL carton packs for the organic baby carrots, organic kidney beans and organic peas sold in its German stores.



The combisafe carton packs used by ALDI Sud are marked with the label of the Forest Stewardship Council (FSC). The label confirms that the paperboard used to make the package is sourced from responsibly managed forests and other controlled sources.

Visy Technology Systems  
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### Automatic denesting system for plastic trays

The Intray Smart Stand is an automatic denesting system for plastic trays. The unit is servo motor driven with no mechanical wear caused by linear movement of pneumatic systems and no air to contaminate the tray before product placement.

The system is compact and simple to incorporate into production and is designed for industrial cleaning. It can be changed to accommodate a different tray in under 2 min and can operate at speeds of up to 160 trays/min.

Emrich Industries Pty Ltd  
[www.emrich.com.au](http://www.emrich.com.au)

### Leak detection technology for packaged goods

BOC has launched MAPAX LD leak detection technology that offers high-speed and non-destructive inline leak detection for the packaged goods industry.

Leakage and failure can occur when food packages are not all fully hermetically sealed. This can be due to poor sealing, physical damage such as pinholes or when product gets caught in the seal and can lead to loss of shelf life, damaged products or poor appearance and therefore spoilage. The leak detection technology uses hydrogen as the detection gas and detects faulty packages which can be removed from the production chain more quickly and easily. The technology allows 100% of packages to be tested in a non-destructive manner, reducing spoilage and minimising environmental impact, because only the leaking packs need to be destroyed instead of the entire batch.



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## Micro-perforated lidding films for soft fruit

TCL Packaging has developed micro-perforated printed lidding films for soft fruit.

The films permit precise gas and moisture transmission rates, effective tray sealing and protection from contaminants which can affect fruit packaged with standard hole-punched lidding films.

The company says that using pre-printed film avoids impeding the film performance by secondary labelling.

**TCL Packaging**

[www.tcl-packaging.com](http://www.tcl-packaging.com)

## Miniature photoelectric sensors with large sensing ranges

SICK W100-2 miniature photoelectric sensors are compatible with all standard detection principles (through-beam photoelectric sensors, photoelectric retroreflective sensors, photoelectric retroreflective sensors for detecting transparent objects, energetic sensors and sensors with background blanking), making them suitable for detection applications.

The bright, visible light spot, the clearly visible status indicator LED s and the integrated M3 threaded mounting hole make commissioning quick and easy. Options in terms of switching output (PNP or NPN) and connectors (male connector, M8, 3-pin; male connector, M8, 4-pin; cable, 2 m), light/dark switching and sensitivity adjustment allow for a wide variety of sensor variants.

The WT100-2 photoelectric proximity sensor features long sensing ranges of up to 1.2 m. The WT100-2 photoelectric retroreflective sensor with background blanking features reliable detection while simultaneously blanking backgrounds. The WL100-2 photoelectric retroreflective sensor features long sensing ranges of over 7 m on the PL80A reflector. The WL100-2 photoelectric retroreflective sensor for detecting transparent objects features reliable switching and long sensing ranges for transparent materials. The WS/WE100-2 through-beam photoelectric sensor features long sensing ranges of over 30 m. Accessories including slotted diaphragms and polarisation filter attachments to enable positioning tasks to be carried out and small objects to be detected reliably.

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# Five pitfalls to avoid in packaging design



Assuming that package design is a straightforward process can compromise a company's brand, supply chain and even financials. The team from Studio One Eleven - the design and innovation division of Berlin Packaging - has more than 150 years' experience creating successful packaging. Here, they outline the common pitfalls they've encountered - and tips for avoiding them.

## Ideation without a solid foundation

Brand positioning, consumer insights, competitors' strengths and weaknesses, market trends - these factors and many others are the building blocks of a proper design process. But many agencies overlook or simply don't seek out these critical inputs. Designing great packaging requires a full and accurate analysis of where, how, and for whom a package must perform, addressing factors from costs to merchandising to sustainability.

## Designing without the supply chain in mind

A good package solution is much more than a compelling visual; it's a well-reasoned response to a commercial opportunity that can be manufactured efficiently and flow smoothly through the whole supply chain.

## Narrow thinking

It's important to appreciate the visual vernacular of the product category in which you're competing, but ground-breaking solutions also take cues from outside the category and challenge conventions in ways that consumers appreciate.

## Designing for the sake of design

Properly framed, design is the creative means to a commercial end. Market-ers and brand owners want to engage partners and advocates who pursue a common-sense goal of building a successful brand.

## Accepting misaligned incentives

Agencies that sell their time are, by definition, driven to take more of it, sometimes placing their financial incentives at odds with their client's need for speed and efficiency. On the other hand, package manufacturers are incentivised to fill machine capacity, so their decisions aren't driven by the best solution for the brand but rather the best solution that they can manufacture. You should pay only for real performance and ensure that your interests and those of your partners are aligned.

"There are lots of players in the market today that say they're qualified to develop a product or package. Very few, however, have the skills, the tools, the aligned incentives, and a certified process to do so properly," said Scott Jost, vice president of innovation and design at Studio One Eleven.

"With all that is at stake, companies are wise to work with a team that is well-versed in every aspect of developing this critical business asset."

Studio One Eleven's recently launched refreshed website, [www.studio111design.com](http://www.studio111design.com), features an array of content that informs package and product design decision makers. The site includes an overview of the company's practice areas and ISO-certified design process, examples of work and white papers.

Studio One Eleven  
[www.studio111design.com](http://www.studio111design.com)



A.B.N. 22 152 305 336  
[www.westwick-farrow.com.au](http://www.westwick-farrow.com.au)

Head Office  
Cnr. Fox Valley Road & Kiogle Street,  
(Locked Bag 1289) Wahroonga NSW 2076  
Ph: +61 2 9487 2700 Fax: +61 2 9489 1265

Chief Editor: Janette Woodhouse  
[wnift@westwick-farrow.com.au](mailto:wnift@westwick-farrow.com.au)

Publisher: Geoff Hird

Art Director/Production Manager: Julie Wright

Art/Production: Tanya Barac, Odette Boulton

Packaging Section Editor: Alice Richard

Assistant Editor: Alice Richard

Circulation Manager: Sue Lavery  
[circulation@westwick-farrow.com.au](mailto:circulation@westwick-farrow.com.au)

Copy Control: Mitchie Mullins  
[copy@westwick-farrow.com.au](mailto:copy@westwick-farrow.com.au)

## Advertising Sales

National Sales Manager - Nicola Fender-Fox  
Ph: 0414 703 780  
[nfender-fox@westwick-farrow.com.au](mailto:nfender-fox@westwick-farrow.com.au)

Business Development Manager - Jez Whitaker  
Ph: 0487 583 770  
[jwhitaker@westwick-farrow.com.au](mailto:jwhitaker@westwick-farrow.com.au)

NSW, QLD - Kerrie Robinson  
Ph: 0400 886 311  
[krobinson@westwick-farrow.com.au](mailto:krobinson@westwick-farrow.com.au)

VIC, SA - Sandra Romanin  
Ph: 0414 558 464  
[sromanin@westwick-farrow.com.au](mailto:sromanin@westwick-farrow.com.au)

WA - Mandi Grubisin  
Ph: 0468 840 739  
[mgrubisin@westwick-farrow.com.au](mailto:mgrubisin@westwick-farrow.com.au)

NZ - Mark Ryu  
Ph: 0800 44 2529 Fax: +61 2 9489 1265  
[mryu@westwick-farrow.com.au](mailto:mryu@westwick-farrow.com.au)

Germany, Austria, Switzerland - Eisenacher Medien  
Ph: +49 228 249860 [info@eisenacher-medien.de](mailto:info@eisenacher-medien.de)

Asia - Lachlan Rainey  
Ph: +61 (0) 402 157 167  
[lrainey@westwick-farrow.com.au](mailto:lrainey@westwick-farrow.com.au)

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**SOUTH AFRICA** +27 (0)41 453 1871  
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