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APR/MAY 2016

VOL.1 NO.4

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cover: © AGPhotography/Dollar Photo Club

## READ ONLINE!

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download at :

[www.foodprocessing.com.au/magazine](http://www.foodprocessing.com.au/magazine)

## 'Chemicals' is not a nasty word and nor is 'ready meals'

I recently read a 12-month-old article in the UK's *Daily Mail* — 'Read this and you'll never eat a ready meal again' by Joanna Blythman.

The article carried every possible emotive cliché to badmouth the ready meal industry:

- The companies that make ready meals ... operate from vast anonymous warehouses on industrial estates with bland, innocuous names.
- Even when you buy food that is promoted as being freshly made on-site, the components could have been mass produced in these windowless warehouses.
- One thing all of us know about processed food is that E numbers are bad.
- "E numbers have a very high 'label polluting' effect. 'Chemicals' is seen as a nasty word."
- In truth, the 'clean label' ploy is a superficial exercise with the embarrassing ingredients hidden rather than chucked out.
- The ready-meal world is highly organised and intensely secretive.
- Their thousands of employees work long, demanding shifts of 12 hours or more, behind walls with no windows...

Really? Really?

The article did mention that more than three billion ready meals were eaten in Britain in 2012 and they make up the

biggest sector of the UK's £70 billion-a-year food budget.

These facts alone must convey the message that people actually like ready meals.

Does the author have no business sense? The key to being a successful ready-meal manufacturer is repeat business. One-off purchases do not contribute to long-term market success. Manufacturers try very hard to produce appetising food at a cost acceptable to the purchaser — from very low priced to high-end gourmet fare with high prices.

While I am going on about poor media representations, can I put in a mention for the word 'chemicals'? Everything that is something is a chemical — every natural, organic, cooked by Tibetan monks over a fire that has been burning continuously for 2000 years food is made of chemicals. So are we.

It is high time we stopped maligning the word chemical!

Also, it is worth noting that preservatives have probably saved more lives than antibiotics by ensuring that people do not eat 'off' food and suffer the consequences.

All this said, ready meals have a valuable place in many people's diets. This anti-ready meal diatribe from the UK is especially bewildering when the same country is building inner-city apartments without any kitchens at all.



Regards

Janette Woodhouse



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# Taking care of the heavy work.

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**T**he first 'in flight' food was served on a Handley Page flight from London to Paris in 1919 and the airline catering industry hasn't looked back since.

Nowadays the scale of airline meals is staggering, for example Emirates Flight Catering facility (EKFC) in Dubai prepares up to 180,000 meals each day. In 2014 the EKFC supplied almost 50 million meals for Emirates flights and 8.236 million for other airlines. And this represents only 65% of the meals prepared by Emirates!

The \$159 million Dubai facility covers 88,000 m<sup>2</sup> and features a 2.55 km-long electric monorail, which transports meal carts to and from the planes. Initially, the facility was designed with a capacity of 150,000 meals per day in mind, although after various expansion efforts, it is now capable of producing over 175,000 meals a day and operates 24 hours/day. On any given day, 119,000 economy meals, 19,000 business-class meals, 2500 first-class meals and 11,000 crew meals will be served onboard Emirates 249 aircraft.

With such large-scale catering, food safety is a major concern. Urban myth has it that the two pilots on a flight are served different meals — and cannot share — just to avoid both being struck down with food poisoning.

Emirates Flight Catering Senior Vice President Joost Heymeijer puts food safety at the top of his agenda: insisting that the key to keeping things above board and pure is to have complete 'traceability'.

The scale of the airline catering kitchens is immense.

At the United Airlines catering facility, Chelsea Food Services, located near Newark International Airport in New Jersey, a team of 1000 produces 33,000 meals per day.

There is little automation with vegetables being hand chopped. Food is only part cooked. Steak, for example, is cooked 30% of the way with the final cook being done onboard in the aircraft's convection ovens. Meals are not allowed to sit for more than six to eight hours before boarding a plane. If a flight is delayed for more than a couple of hours, all of its meals could get thrown out and replaced. Not only is the food wasted, but employees have to work overtime to get the new food ready.

At Emirates, 500 chefs cook the huge array of fresh food before it's frozen in super-fast blast freezers: 58 million bread rolls; 15 million croissants; 13 million eggs; 4300 tons of chicken; 1100 tons of lamb; 3.6 tons of lobster.

Safety regulations prohibit the use of open-flame grills in commercial aircraft, meaning cabin crew warm the pre-cooked frozen meals.

The rumour that airline food is designed to make you relax and even fall asleep is laughed at by airline caterers — though

the chefs do choose meals that are more flavoursome to overcome the slight taste alterations experienced when dining at altitude.

Airline cuisine has been going through a bit of a renaissance as airlines compete for passengers. Air France upped the ante with its a la carte options in 2014, offering cocktails, gourmet selections and ice-cream on elegant trays designed by Eugeni Quittllet, a student of legendary French designer Philippe Starck.

In the US, Delta Air Lines has furthered its partnership with Danny Meyer's Union Square Hospitality Group (on the coattails of its alliance with Blue Smoke restaurant in 2013) with an exclusive menu.

Catering to the palates of business- and first-class passengers means many airlines are now partnering with Michelin-starred chefs.

- Hawaiian Airlines Featured Chef series — the airline is featuring locally inspired meals from five of the islands' top chefs on a six-month rotation.
- Qatar Airways' Master Chefs program features recipes from world-famous Nobu Matsuhisa and Vineet Bhatia.
- Finnair From the North menu — the airline partners with various Helsinki restaurants, including Nokka, to provide passengers with unique dishes like wild reindeer and grilled sander fillet served on Marimekko.
- Singapore Airlines International Culinary Panel — chef-driven menus vary depending on the origin and destination of the flight, but can include dishes from chefs including Alfred Portale in the US and Carlo Cracco, who has a two Michelin-starred restaurant in Milan.
- SWISS Taste of Switzerland features a rotating menu that highlights different chef creations from each of the country's canton regions or vegetarian options from Hiltl.

Let's not ignore Australia — Qantas and Neil Perry's Rockpool Market Inspirations Menu includes sustainable and locally sourced meals for its premium cabins. In partnering with a Sydney-based company called Botanica, Qantas is now also serving cold-pressed juice to its domestic business-class passengers. □



## Bean salad range

Edgell has launched a range of satisfying shelf-stable bean salads, aiming to offer consumers a balance between taste, convenience and nutrition.

The Bean Salad range includes the following flavours: Lentil Salad with brown rice and chick pea in a mild curry spiced dressing; Red Kidney Bean Salad with quinoa and black bean in a smoked paprika dressing; Cannellini Bean Salad with risoni and red kidney bean in a balsamic dressing; Chick Pea Salad with buckwheat in a lightly spiced honey and lemon infused dressing.

Simplot Australia Pty Ltd  
[www.simplot.com.au](http://www.simplot.com.au)

## Easy open fruit cups

SPC ProVital fruit cups provide easy access for patients with fine motor skills difficulties.

The range of portion control fruit cups has been designed with easy open packaging developed using guidelines established by Arthritis Australia, receiving the highest possible score from Arthritis Australia: Accessibility Rating +8, indicating that 95% of the population can open the package easily.

The fruit cup also achieved the tick of approval from Georgia Tech Research Institute in its consumer product 'ease of use' test, for people with arthritis.

Key features of the fruit cups include: 100% Australian Fruit; portion controlled to deliver one serve of fruit; clear instructions for opening; a textured and lengthened pull tab for easier grip; optimised seal to reduce opening force; decagon shape for easier grip; smaller grip span for easier hold; easy to locate and read best-before date; extra-large font for improved legibility.

SPC Ardmona  
[www.spcardmona.com](http://www.spcardmona.com)

## Springhill Farm takes off

It has been a busy year for Victorian family food business Springhill Farm, whose range of treats has been picked up by Qantas Catering, Coles Supermarkets and Target Stores nationally.

The upturn in demand for the products has required a second shift in the company's factory, with a doubling of factory staff. Turnover has also doubled in the last three years, posing the question: how is the business succeeding in a challenging climate for FMCG?

"We sat down a few years ago and conducted a strategic review of the business," said director Fiona Whatley. "We have a real commitment to the evolution and growth of the business and a strong belief in supporting local community."

With over 30 years' experience, Springhill Farm is hardly the new kid on the block. The company's first slices were whipped up in the farmhouse kitchen 30 years ago for visiting schoolchildren, who came from across Victoria for a taste of farm life and baked goods so fresh they were still warm. The business is still proudly based in regional Victoria and baking daily.

Second-generation owner-operator Fiona Whatley said that these days the family's most popular recipes tend to be those that are refined for the health-savvy customers who prefer smaller portions and allergen-friendly ingredients. "Without a doubt, our Bite-Sized Treats are some of our most popular products," said Fiona. "And it was so exciting when such an iconic Australian brand like Qantas recognised our range and wanted to serve it! We get a real kick when we hear from family or friends that they received one of our products on a national flight, knowing that our bites and slices range are being so well received by the consumer is a real positive."

Springhill Farm's range includes Bite-Sized Treats, Gluten-Free Treats, Finger Slices, Biscuits, Rocky Road and Hedgehog, available in individually wrapped and vacuum-packed trays.

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# Focusing on healthy, fresh food options

## Fine Food Queensland 2016

**F**ine Food Queensland is the state's premier food trade event, catering for Queensland's burgeoning foodservice, hospitality and food retail industries. The

show brings together over 200 exhibitors and 5000 visitors to do business, and to celebrate new ideas and innovation in the food industry. Featuring the latest products and equipment, Fine Food Queensland also offers a comprehensive program of educational sessions and business discussions.

The food industry in Queensland is currently sustaining one of the highest growth rates in all states and a key objective of Fine Food Queensland is to assist local Queensland businesses to harness this prosperity.

The show's line-up will ring true to its tagline of fresh, healthy ideas served daily with an array of exciting seminars, interactive sessions and competitions on the agenda. A strong local approach coupled with the best of the national industry will make the event a 'must attend' for all businesses wanting to deliver on the healthy, fresh food options that Queenslanders are demanding.

### Talking Food Stage

The 'Talking Food Stage' will cover an array of topics pertinent to the industry, from how to increase your business efficiency with technology to the ongoing debate over formal versus informal food offerings. Eye-opening discussions will also include debate over whether insects will be our next major food source and the truth about employing the right people.

### Coffee anyone?

Coffee, of course, features at the show, with a session on how this liquid gold can impact your bottom line. The World's Richest Barista Competition is also set to be a show favourite amongst caffeine aficionados and those with a competitive spirit alike. After the success of the inaugural World's Richest Barista Competition last year, both finalists will return to Fine Food Queensland to again battle it out for the 2016 title and a share of the \$50,000 prize pool. The teams of baristas must work together to make a range of beverages based on seven customer orders consisting of espresso,



When: 10–12 April 2016

Sunday & Monday: 10 am–5 pm

Tuesday: 10 am–3 pm

Where: Brisbane Convention & Exhibition Centre

More info: [www.finefoodqueensland.com.au](http://www.finefoodqueensland.com.au)

Registration: For FREE entry register online: [finefoodqueensland.com.au/clean](http://finefoodqueensland.com.au/clean) using promo code CLEAN.

latte, dine-in and takeaway drinks. Four workshop sessions will also be held as part of the competition, and will take place over the first two days of the show.

### Pastry and baking

In more delicious news, there is an addition to the Bakery zone this year — Kirsten Tibballs will have her own Pastry Stage at which she will present a series of sweet treat tricks and tips, helped by Ben Haslett. The timetable of sweet treats will complement the happenings at the Baking at Fine Food demo stage, which is always a great source of inspiration for bread and related products.

### Promoting culinary excellence

More competitive spirit will be found at the Australian Culinary Challenge Re-

gional Competition, which is committed to showcasing and promoting culinary excellence through culinary competition. The competition includes a Live Hot Kitchen and a Static Display of Culinary Art including savoury buffet centrepieces, sweet buffet centrepieces and 'wild and wacky' cakes.

### Local and national experts

By providing access to both local and national experts, new products and innovations, Fine Food Queensland 2016 has been designed to maximise opportunities for businesses to do business on the show floor, as well as stay ahead of industry trends from around the state, country and the world.

Event Director Minnie Constan said, "We've listened to what people want from this show, and we've reinvigorated it as a

result. The show has a fresh feel, which is a perfect match for our focus on fresh, healthy food and eating. From direct access to the state's best growers at Fresh Produce Lane to the experts at Talking Food Stage, who will be translating international trends into Queensland's local needs, Fine Food Queensland provides access to all facets of the industry under one roof. It's the perfect opportunity for those in foodservice and hospitality to learn, network and grow their businesses."

Fine Food Queensland is strictly a trade-only event. Children are not permitted.

### Register online for free entry

For free entry to Fine Food Queensland, please register online at [finefoodqueensland.com.au/clean](http://finefoodqueensland.com.au/clean) using promo code CLEAN. □

## Floor Plan

Halls 3-4, Brisbane Convention & Exhibition Centre, South Bank





## Food processing construction service

SBP Australia provides construction and maintenance services for food processors, including conveyors, hoppers, augers and food processing systems.

The company has experience in a range of projects, from complete line layouts and builds, vertical form fill seal machines, conveyors incorporating Mathews printers, product value-adding, ULMA flow wrappers, stainless steel valves and pipework, specialist pallet racking and coldrooms.

SBP Australia Pty Ltd  
[www.sbpa.com.au](http://www.sbpa.com.au)

## Salt range for prepared food

Cheetham Salt has repackaged its Mermaid range of salt for the prepared food industry in polyethylene (PE) bags in order to meet food-grade quality standards and offer improved environmental benefits through recycling and reduction of packaging material.

Mermaid Flossy Salt is suitable for brine for prepared salads and vegetables, while Mermaid Premium Salt and Mermaid Superfine Salt both assist in flavour ingredients in prepared food and sauces.

Features of the repackaged range include: a PE bag with a labyrinth seal, which provides an impervious packaging barrier; a pallet stretch hood; tight, evenly packed pallets; and a UV barrier in both PE bags.

The PE bag reduces the risk of fine packaging threads and fibres; prevents water absorption and outside contaminants; improves customer warehouse capacity and safe manual handling; and extends salt storage life.

The salts are food-grade accredited with ISO 9001, HACCP, Halal, Kosher and BFA Organic certification.

Cheetham Salt  
[www.cheethamsalt.com.au](http://www.cheethamsalt.com.au)

## Lunch bags and containers for adults

Smash has created a 'Dining at Work' range of lunch bags, food storage containers and servingware. Its Ladies Lunch range combines fashion with function, while the Men's Dining lunch bags are designed to suit both white- and blue-collar workers.

The range of food storage containers has the appearance and feel of ceramic servingware and consists of microwaveable plates, bowls and snack containers.

Smash Enterprises  
[www.smashenterprises.com.au](http://www.smashenterprises.com.au)

## Ready meals served in restaurants and consumers aren't happy

In the UK, Channel 4 has been airing a documentary series 'Tricks of the Restaurant Trade' that claims to reveal restaurant industry secrets. Episode 3, which went to air on 19 January, has been causing quite a stir in the community.

The program discussed how many UK chains (like Leon and Frankie, PizzaExpress and Benny's) use pre-prepared food from centralised kitchens and outside caterers that is simply microwaved before being served to customers.

By using off-site, central kitchens to produce food, the chains can ensure consistency and quality across multiple sites.

However, while this type of outsourcing is widespread, it is little known by consumers outside the food service industry and viewers of the documentary want restaurants to be more upfront with their customers and acknowledge when the meals are pre-prepared.

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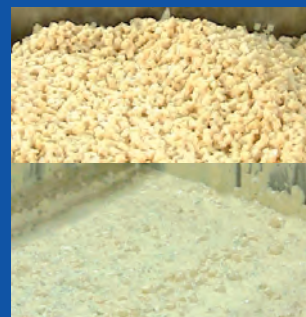
After 5 minutes

MEAT COATED WITH SPICES



After 1 minute

MAYONNAISE BASED POTATO SALAD



After 12 minutes

To see the video go to [globalms.com.au](http://globalms.com.au) and click on GBT300

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## Testing facility for equipment and ingredients

At CBS Foodtech's equipment and ingredients testing facility, food manufacturers can take the first steps in the decision-making process risk-free.

The dedicated, fully functioning, refrigerated facility houses a large spectrum of machinery — from brands including Treif, Rex, Reich, Stephan and Sesotec — capable of producing an array of food products, while demonstrating capabilities of throughputs, yields, product presentation and new product development.

Located at the company's head office in Warriewood, Sydney, the facility helps manufacturers and food innovators to significantly reduce the risk and time normally required to make purchase and product development decisions.

As well as capabilities for slicing, dicing, cooking, marinating, injecting or inspection, CBS also sells and has its own ingredients brands, to assist with the development of new products and flavour profiles.

Suitable for a variety of businesses — from butchers to large food manufacturers or chefs — once trials have been completed users are issued with all results including indicators of any yield and cost savings in comparison to current performance. Videos and photographs are also available.

CBS Foodtech  
[www.cbsfoodtech.com.au](http://www.cbsfoodtech.com.au)



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# A feast for the eyes

## — smooth puree diet moulding improves oral intake

*Olivia Farrer, Accredited Practising Dietitian and PhD Candidate*

Food service practices and diabetes management in aged care

Texture modified diets, particularly smooth puree diets, have long been known to have little visual appeal, with a loss of texture and resemblance of the original

food and even change in flavour from dilution of the food to achieve the right consistency. Such diets are frequently used in acute and residential aged care predominantly for people with dysphagia (swallowing difficulty) and who are at risk of aspiration, which can result in serious illness or even death. Approximately 10% of patients in acute care and 30–60% of residents in aged care have dysphagia and require management with a texture-modified diet, which is likely to be long term with very few returning to normal texture diets.

Modified texture diets are often associated with a poor oral intake, which is frequently cited as being due to appearance, texture and mouthfeel of the food. Malnutrition in



institutional care is prevalent in up to 60% of hospital inpatients and aged care residents alike. Poor nutrition can increase hospital length of stay and negatively impact health, such as through poor wound healing or affecting immunity, and can increase risk of aged care resident hospital admissions and overall healthcare costs. Therefore, strategies for improving oral intake are of great interest to all agents involved in institutional food service.

A smooth pureed diet is, by definition, smooth, moist and lump-free with no coarse fibres, and efforts to improve presentation have so far been limited to serving each meal component separately on a divided plate rather than blended together. More recently, studies have been trialling moulded puree food to a three-dimensional form that where possible closely resembles the original food, with some international food service providers being able to go so far as providing puree salads.

Of the studies that have examined changes in oral intake through puree food moulding, one study found a 15% increase in overall volume of the meal eaten, con-

tributing to an increase of 41% energy and 36% protein. Similarly, a pilot study in acute care trialling smooth puree moulded protein serves at main meal times saw a mean reduction of 126 g in plate waste and an increase in patients consuming all of their meals when provided a moulded smooth puree diet.

For the patient or resident on a moulded smooth puree diet, this may mean being able to look forward to mealtimes again, better recognising the foods on their plate and consuming more food as a result. For food providers this should mean less wastage, improved nutrition outcomes and in acute care, shortened length of stay — how much this relates to in food service dollars is uncertain and more research is clearly needed in this growing practice. □

*Olivia Farrer, a UK-qualified dietitian, has now been living in Australia and working as an Accredited Practising Dietitian for almost 10 years. After working clinically, Olivia embarked on a career change pursuing lecturing at the University of South Australia where a passion for food service dietetics developed. Olivia is now at Flinders University (SA) finishing her PhD examining policies and practices around food provision in aged care under the supervision of Prof Michelle Miller, Dr Alison Yaxley and A/Prof Karen Walton of the University of Wollongong. In addition, Olivia provides menu consultancy services for Avanticare — allied healthcare and training for residential aged care services (SA). Olivia is an Accredited Practising Dietitian and member of the Dietitians Association of Australia's Food Service Interest Group. To find an Accredited Practising Dietitian (APD), visit the 'Find an APD' section of the DAA website at [www.daa.asn.au](http://www.daa.asn.au) or call 1800 812 942.*

*To find an Accredited Practising Dietitian, visit the 'Find an Accredited Practising Dietitian' section of the DAA website at [www.daa.asn.au](http://www.daa.asn.au).*



## Food audit fact sheet

In NSW, Food Regulation 2015 requires that certain industry sectors are licensed with the NSW Food Authority, including:

- businesses that handle, process or store meat
- dairy farms, factories, vendors and milk collection contractors
- businesses that handle seafood and shellfish
- food service to vulnerable persons in hospitals and aged care facilities
- high-priority plant product businesses
- the egg industry

To protect public health and safety, and ensure compliance with Food Regulation 2015 and the Food Standards Code, the NSW Food Authority undertakes regular audits and inspections of all licensed businesses under two different audit models. New licensees and existing licensed low-risk businesses that apply for a high-risk licence to produce ready-to-eat foods are subject to an increased audit frequency under the licensing audit model.

Once a food business can demonstrate long-term compliance with legislative requirements, it moves to the compliance audit model, where routine audits will be undertaken. The frequency of audits will depend upon the type of business (priority classification), as well as the rating received at the last audit.

The NSW Food Authority publishes a fact sheet on food audits, which is available from its website.



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# Wine glasses: does size matter?



**T**iny food on enormous plates is now considered passé, so are oversized wine glasses merely a fad?

While for many of us a large glass merely means more wine, Canadian wine glass manufacturer John D'Addario insists there are real benefits to tall wine glasses that actually make for a more nuanced and fulfilling wine-drinking experience.

D'Addario may have a vested interest in convincing diners of the advantages of the oversized glass — his company 12 Obsession produces one of the largest glasses on the market, measuring a staggering 30 cm in height from table to rim.

"We really wanted to design a large

wine glass series that not only intensifies wine aroma, but allows the different layers of aroma to come through," said D'Addario.

12 Obsession's specialty, lead-free crystal wine glasses are made in a traditional, blown-glass style. Due to its increased size, the glasses are able to support a larger bowl — 15 cm in height — than most stemware.

According to D'Addario, a larger bowl allows the wine to coat a greater surface area of the glass, amplifying the aroma.

As the wine aerates or 'breathes', it releases its basic aromas and fruity, mineral or floral notes. Taking in these aromas and notes by sniffing the wine helps to prime the tastebuds, which provides a more satisfying drinking experience.

Most red wines feature 13–15% alcohol. According to D'Addario, alcohol masks the aromas and flavours of wine. A larger bowl intensifies aroma, thereby reducing the perception of alcohol.

The glassware is available in 12 different shapes to optimise the wine-drinking experience of other types of wine and spirits. For port or grappa, D'Addario designed large glasses that feature bowls with a distinct tunnel shape, which helps to channel subtle aromas that a wine enthusiast might otherwise miss.

D'Addario insists his glasses are light and easy to handle, courtesy of the deep bowls which produce a low centre of gravity. But even so, filling them to the brim is probably not recommended — for your biceps or your liver. □



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# Where did that foreign body come from?



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

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

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

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

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

### **'Zero tolerance' is now the norm**

Despite the industry's best efforts, it is probably inevitable that foreign particles and matter will periodically be found in food products.

Most raw foods and ingredients originate in a natural environment — a farm, an orchard, a market garden... As the food is picked or harvested, foreign objects such as stones or glass can end up comingled and transported into the processing plant. Additionally, objects found in manufactur-



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

ing facilities can also find their way into the processing stream. Lastly, fragments of bones, pits or shells that are removed during processing can end up hidden in the final products.

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

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

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

### **Prevention and elimination of foreign bodies**

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

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

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

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

### **Is the foreign body contaminant complaint genuine?**

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

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

### **What can you do?**

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

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

X-ray fluorescence technology (XRF) lets users identify the elemental composition of foreign bodies and now, new handheld XRF analysers are moving this technique from the lab to the production line or field. The



**XRF can identify a variety of contaminants such as metals, glass, stones, bones, rubber and hard plastics.**

elemental composition of foreign bodies (down to around 0.5 mm) can be determined very easily with reliable, low-cost, lab-quality information — giving users a ‘fingerprint’ of the contaminant.

### Fingerprint the plant

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

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

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

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

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

### More detail about XRF technology

XRF can identify a variety of contaminants such as metals, glass, stones, bones, rub-

ber and hard plastics. One of the major advantages of XRF is that measurements can be carried out on solid samples, avoiding sample digestion-dissolution, and results are available almost instantly.

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

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

#### The X-ray fluorescence process

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

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

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

The electron drops to the lower energy



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

#### Interpretation of XRF spectra

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

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

#### Energy dispersive X-ray fluorescence (EDXRF)

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

For more information contact Thermo Fisher Scientific at [www.thermofisher.com.au/fbi](http://www.thermofisher.com.au/fbi). □

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

## Production bratt pans

The Waldorf range of Production Bratt Pans is suitable for use in commercial kitchens and food production facilities for the production of sauces, casseroles, curries and searing steaks. The pans remove the physical labour and potential injuries associated with staff cooking such foods in large volumes.

The pans are available in a range of models in 150 or 200 L capacity and with a choice of either pressurised units for reduced production times or Integrated Mixing arm models for reducing manual handling.

Constructed from full stainless steel, with a bimetallic heat diffusing base providing heat distribution plus high-density thermal insulation, all units are supplied with measured water volume control allowing the user to set an amount of water required.

The 'RM' mixing models with integrated mixing arm offer variable mixing speeds, advanced temperature control and multiple mixing attachments that can be used depending on the food being cooked.

The 'P' pressure cooking models can operate as a standard bratt pan or switch to pressure mode to reduce cooking times.

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Serving more than 81 million meals each year gives Disney a lot of experience in managing food safety and now the company is licensing its food safety system to outside restaurants and chains.

Every year Disney serves more than 81 million meals to visitors to its American theme parks and resorts. With so many meals it is vital that the company's food safety policies and practices are robust and reliable as a high-profile food safety fail could prove disastrous.

More than 15 years ago, Disney began working with Motorola Solutions and others to devise a tracking system so it could track its ingredients from 'farm to fork'. In late



“

Now, using custom software on mobile devices Disney can, for example, track milk from the point where it's collected from the cow to when it becomes a Mickey-shaped ice-cream bar.

The mobile food safety solution can now be licensed by hospitality establishments worldwide. Leveraging Walt Disney Parks and Resorts' safety technology and best practices, the Disney CHEFS food safety solution is suitable for large enterprises seeking to improve food safety, deliver a better customer experience and eliminate paper-based processes.

By using wireless temperature probes and Zebra's MC40 mobile computers, the automated Disney CHEFS, powered by iCertainty software system, can provide real-time information on food safety performance — eliminating manual, time-intensive paper records for food safety audits and regulatory compliance. The vision behind creating Disney CHEFS was to build in the cultural competencies necessary to help deliver on guest service through standardised repeatable processes.

"Safety should always be an organisation's number one focus. At Walt Disney Parks and Resorts, we believe it is our responsibility to share our safety technologies and best practices to increase the safety awareness of companies and agencies around the world," Walt Disney Parks and Resorts Chief Safety Officer and Vice President of Worldwide Safety Greg Hale said. "The Disney CHEFS system, powered by iCertainty, is being integrated across all our food service locations. With Disney CHEFS, we can continually improve our approach to food safety, taking us from hindsight to insight and foresight."

### System highlights

- The Disney CHEFS solution follows the Hazards Analysis Critical Control Point (HACCP) system's international guidelines that identify the precautions that companies should take to keep food safe — and outlines controls and processes that should be followed to make sure these precautions are taken.

- The software system can electronically monitor every aspect of preparation — from handwashing to cooking and storage temperatures.
- Walt Disney Parks and Resorts has deployed the Disney CHEFS solution in more than 700 food and beverage locations throughout its US domestic parks and resorts, Disneyland Paris, Hong Kong Disneyland and Shanghai Disney Resort and is continuing its implementation with the Disney Cruise Line.
- The Zebra MC40 provides one-touch access to all the HACCP checklists and procedures that employees are required to follow to maintain food safety.
- The Disney CHEFS solution can also alert employees if food is not at an acceptable temperature or when critical measurements have not been recorded — helping avoid potential problems before they become an issue.

Disney CHEFS powered by iCertainty is a world-class standard for digital HACCP. It provides food service operators with powerful business insights to help reduce risk, drive compliance and improve operational efficiency. The system allows users to replace their outdated and unscalable paper tracking and reporting processes with a state-of-art mobile digital tool that eliminates paper, saves time and drives accountability.

The system provides users with measurability, scalability and top-down visibility into every aspect of food service operations, while driving down the cost of compliance. Operators gain real-time compliance oversight, on-demand employee task training and actionable insights. The software-hardware solution can help users to better comply with food safety regulations.

A Disney spokeswoman said the company was happy to offer best practices that can help others improve safety at their organisations. □

2014, Zebra Technologies acquired Motorola Solutions' enterprise business and continued working with Disney along with other companies including iCertainty and Versid.

Now, using custom software on mobile devices Disney can, for example, track milk from the point where it's collected from the cow to when it becomes a Mickey-shaped ice-cream bar.

Zebra Technologies provides the hardware, which runs software built by Baltimore-based iCertainty on Zebra's Android mobile computers. Food service workers use temperature probes that connect wirelessly to the mobile devices to track food throughout the preparation process. They also use the installed Disney CHEFS app to catalogue details such as whether employees wash their hands frequently.



## Thermoformer

The Multivac R105 MF thermoformer produces skin packaged designs using the Multifresh application. It can extend the shelf life of products by preserving the quality, freshness, colour and texture while providing premium presentation and minimalistic packaging.

The company manufactures four thermoforming packaging machines that use MultiFresh, which are able to cater for a range of pack sizes and output requirements.

The thermoformer has the capacity to produce high output product at high quality and secure the product in place without tension.

MULTIVAC Australia Pty Ltd  
[www.multivac.com.au](http://www.multivac.com.au)

## Flexible packaging rewind

Burgess Printing & Packaging has an in-house design team that will assist clients to create an innovative packaging design that also ensures a quality product.

The company offers a wide range of materials designed for 'fit for purpose' applications and structure to improve packaging performance in all markets. These include barrier and non-barrier structures, inclusive of both high and low structures, and metalised and multiple layer structures. The flexible packaging rewind is also suitable for thermoform and VFFS applications.

The flexible rewind packaging technology structure will improve packaging performance for fresh foods including dairy, fresh red meat, smallgoods, perishable products, condiments, fresh pasta and an entire range of fast-moving consumer goods.

Clients are able to choose from a wide range of films and laminates suitable for traditional flexible rewind applications. With extensive experience in perishable applications and products, the Burgess Printing & Packaging sales and design teams will guide clients to a style and product material that will propel products to their full potential in the marketplace.

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## Beetroot finishing vinegar

Nicholson Fine Foods Euro Style Spiced Beetroot Finishing Vinegar shows spiced earthiness and beetroot flavours. Suitable as a salad dressing or splashed onto cooked meats and cheeses, the vinegar is a six-time winner at the Sydney Royal Fine Food competition.

The vinegar is available in two bottle sizes: 825 mL for food service and 265 mL for retail.

Nicholson Fine Foods  
[www.nicholsonfinefoods.com.au](http://www.nicholsonfinefoods.com.au)



## Ready-to-serve smashed egg

Sunny Queen Meal Solutions' Smashed Egg offers quick, tasty meal options for diners on the go: a 100% real smashed egg product ready for final touches to be added with garnishes, herbs, seasonings and sides.

The smashed egg is preservative-free, versatile and longer lasting than alternatives on the market.

Ready to thaw and use in minutes, the smashed egg can be used by cafes, restaurants and commercial kitchens to develop a range of customised egg dishes that can be prepared quickly, even in small preparation spaces. Customers can order quickly and have their meal in just minutes, avoiding long waiting times.

Smashed egg is suitable for a wide variety of dishes such as sandwiches, wraps, salads and canapés.

Sunny Queen Meal Solutions  
[www.sunnyqueenmealsolutions.com.au](http://www.sunnyqueenmealsolutions.com.au)

## Hot smoked Ocean Trout and Atlantic salmon

Petuna has launched Hot Smoked Ocean Trout and Hot Smoked Atlantic Salmon. The ready-to-eat products are suitable to be added to salads and pastas or enjoyed on their own.

Rich in Omega 3, the taste of the hot smoked products is enhanced by a natural hot smoking technique using Tasmanian oak, which results in a delicate taste with a smooth finish and creamy texture. The fish is a good source of quality protein as well as essential vitamins and minerals.

The hot smoked Ocean Trout has a vibrant colour with distinct marbling, while the hot smoked Atlantic salmon has a distinct smoky flavour and firm, flaky flesh.

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## Bakeware

VGM International has available USA Pan commercial bakeware.

Constructed from recycled aluminised steel, the corrugated surface of the pans maximises surface strength and increases airflow within a robust structure. The products are coated with Americoat Plus silicone industrial coating, which is eco-friendly, PFOA- and PTFE-free and creates a clear, non-stick, dishwasher-safe surface.

The pullman loaf pan has a sliding lid designed to produce breads such as pain de mie, pound cake and brioches that are squared with an even crust on all four sides.

The range also includes: classic loaf in two sizes; mini loaf set of four; round cake; square cake; rectangular cake; springform; pie, biscotti and pizza pans; baking sheet; half-sheet/jelly roll; and muffin/cupcake pans.

VGM International Pty Ltd  
[www.vgminternational.com.au](http://www.vgminternational.com.au)

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## Floor sanitising powder

Sanicrunch is a granulised hard floor sanitiser available from Jasol.

The sanitiser is suitable for semi to wet conditions in dairy, meat, poultry and other food preparation environments. The product is a blue granular, free-flowing powder that is spread evenly onto a wet floor and is activated when walked on.

An effective floor QUAT sanitiser, the powder will help to eradicate the threat of bacteria in food preparation spaces, particularly on floors and around drains.

The sanitiser is biodegradable and non-slip.

Jasol Australia  
[www.jasol.com.au](http://www.jasol.com.au)

## The balancing act of health vs taste

Faced with a barrage of nutritional information and advice, how do consumers make choices when shopping for food? Researchers aiming to untangle the apparent disconnect between stated health concerns and actual food purchases have found evidence of 'balancing behaviour' as consumers endeavour to offset health concerns while still purchasing the food they enjoy.

Academics analysed scanner data and survey responses from several hundred supermarket shoppers to see whether and to what extent consumers consciously balanced their health concerns with their food preferences when filling their shopping baskets.

The authors grouped consumers into three segments, based on their attitudes and concerns: health-driven, balanced and hedonic. When faced with healthy or unhealthy choices — which the study based on the level of fat, sugar or salt — the segments showed distinct variations in characteristics, purchasing behaviour and response to marketing mix variables such as price and discount. Each group made trade-offs on the healthy/unhealthy mix to varying extents based on its priorities. Perhaps unsurprisingly, the data showed a marked difference between stated and actual behaviour.

The results, published as 'Impact of Healthy Alternatives on Consumer Choice: A Balancing Act' in the *Journal of Retailing*, found evidence that has implications for retail strategies as well as for public policy.

Retailers can use this research as guidance regarding which products to bundle for promotions and which element of the bundle to promote in order to maximise the impact on healthy consumption, the authors suggest. They further recommend that it is imperative for government agencies to understand actual consumer behaviour in order to successfully promote healthy eating.

## Hygienic brushware

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

The brush head pattern makes the brush easy to clean and dry and improves cleaning efficiency, reducing the risk of product rejection or recall due to contamination from microbes/bacteria, foreign bodies, cleaning chemicals or allergens.

WR&D Wells Pty Ltd  
[www.wrdwells.com](http://www.wrdwells.com)

## Some steak more tender after freezing

When it comes to steak, most of us believe fresh is best. But research shows that some cuts become more tender after freezing.

Meat scientists from Kansas State University say they've confirmed previous findings about the impact of freezing strip loin (known as sirloin in Australia) and inside round steaks. They've tested six major muscles from the hind quarter and found that those two cuts were as much as 10% more tender after freezing.

Steaks were evaluated for tenderness using the Warner-Bratzler Shear Force test, which measures the force needed to shear muscles.

"So the question we had was why did these two cuts react while the other four did not," said John Unruh, professor of animal sciences and industry. Part of the answer is moisture loss. "These two muscles, for some reason, did not lose as much moisture during freezing as the other four," Unruh said.

During the study, Unruh and his team evaluated 125 paired strip loin steaks. The steaks were frozen, thawed and evaluated for tenderness.

"The strip loin steaks showed a 6% improvement in the Warner-Bratzler Shear Force test, indicating a more tender steak," Unruh said. "Moisture loss did occur, but it was low, about 2%."

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# Eat your greens!

Leafy greens have long been lauded for their vitamins, minerals and low kilojoule count. But could they also be the key to good gut health? A research team from Australia and the UK say that these vegetables could be responsible for feeding the good bacteria that are essential for human gut health, effectively locking bad bacteria out.

The researchers have identified a previously unknown enzyme used by bacteria, fungi and other organisms to feed on the unusual but abundant sugar sulfoquinovose — SQ for short — found in green vegetables.

Leafy green vegetables such as spinach produce the sugar on an enormous scale,

comparable to the world's total annual iron ore production. Understanding how bacteria feed on SQ sugars could explain how 'good' bacteria protect our gut and promote health.

The research, published in the journal *Nature Chemical Biology*, was led by Dr Ethan Goddard-Borger from the Walter and Eliza Hall Institute, Professor Spencer Williams from the Bio21 Institute and University of Melbourne, and Professor Gideon Davies from the University of York, UK.

Dr Goddard-Borger said the discovery could be exploited to cultivate the growth of 'good' gut bacteria. "Every time we eat leafy green vegetables we consume significant amounts of SQ sugars, which are used as an energy source by good gut bacteria," he said.

"Bacteria in the gut, such as crucial protective strains of *E. coli*, use SQ as a source of energy. *E. coli* provides a protective barrier that prevents growth and colonisation by bad bacteria, because the good bugs are taking up all the habitable real estate," Dr Goddard-Borger said.

"*E. coli* is a key bacterial coloniser needed by our gut. We speculate that consumption of this specific molecule within leafy greens will prove to be an important factor in improving and maintaining healthy gut bacteria and good digestive health."

Professor Williams said the team had revealed how bacteria extract the sugar from plants in order to fuel their growth. "We discovered the enzyme YihQ, which is used by bacteria to absorb and metabolise these sulfur-containing sugars as food," he said.

"Sulfur is critical for building proteins, the essential components of all living organisms. SQ is the only sugar molecule which contains sulfur, and 'digestion' of the molecule by bacteria releases sulfur into the environment, where it re-enters the global 'sulfur cycle' to be re-used by other organisms."

Professor Williams said that the pathway was unusual, but abundant in biological organisms.

"This work answers a 50-year mystery that has surrounded how sulfur — an element essential for life on Earth — was used and recycled by living organisms," he said. "What is remarkable is that the YihQ enzyme was hiding in plain sight and is produced by the humble bacterium *E. coli*, present in nearly every biologist's laboratory."

The discovery also provides crucial insights that may one day be exploited to develop an entirely new class of antibiotics, Dr Goddard-Borger said, offering hope in the fight against antibiotic-resistant bacteria.

"We think it will be possible to use these widespread enzymes to enable highly specific delivery of antibiotics to harmful forms of *E. coli* and other pathogens, such as *Salmonella*, responsible for food poisoning, while leaving the good gut bacteria untouched." □

Walter and Eliza Hall Institute Biotechnology Centre  
[www.wehi.edu.au](http://www.wehi.edu.au)

## Accessible packaging design course

Catering for the ageing population, as well as people with disabilities, arthritis sufferers and even children, ease-of-use design can be an integral part of packaging design.

A new training course will give participants hands-on experience of the challenges experienced by many members of the community in dealing with packaging materials.

The Australian Institute of Packaging (AIP), in conjunction with Arthritis Australia and Georgia Tech Research Institute, USA, will present a half-day training course, Introduction to Accessible Packaging Design, which aims to improve understanding of accessible design guidelines that can assist with the design of successful ease-of-use packaging.

The course will include packaging examples from around the world and provide information on changing household demographics and meal preparation requirements, and user case studies. Attendees will learn about measuring techniques, injuries caused by packaging and current consumer satisfaction levels with packaging accessibility.

The course offers hands-on team exercises allowing participants to understand the constraints on current packaging designs for people with disabilities, arthritis sufferers, children and the ageing population. This will include simulation gloves that have been developed by Georgia Tech Research University in the US and reading glasses from a UK researcher.

The course is suitable for packaging technologists, packaging designers, marketing professionals and those involved in packaging sales.

The course will be held in Sydney on 14 April.

Australian Institute of Packaging

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## Qantas denies safety issue with cardboard meal boxes

Qantas flight attendants have reported finding cardboard meal boxes smouldering inside convection ovens.

*The Sydney Morning Herald* reports that on one occasion flames were discovered in an oven on a Qantas 737 aircraft while the plane was on the ground preparing for take-off. The cabin crew used a fire extinguisher on the food, which they say had been heated at the correct temperature of 275°C.

The incidents of scorched meal boxes have occurred on Qantas's 737 aircraft, which have convection ovens, unlike its A330 planes, which use steam-based ovens.

The national secretary of the Flight Attendants Association of Australia's domestic division, Jo Ann Davidson, said the union had been inundated with photographs of scorched meal boxes from crew.

"Having had a meeting with senior management today, I have been given an assurance that the product is totally safe," she said.

A Qantas spokeswoman said changes had been made as a precaution to the way crews prepare meals, including reducing the number loaded into ovens at any one time, and reducing heat.


"Both the ovens and the oven-safe cardboard are used by many airlines around the world, and we've done additional testing over the past couple of months to ensure that they are safe," she said.

"We serve millions of meals in these boxes on hundreds of thousands of flights each year, so this is obviously an extremely rare event."

The ovens on Qantas's 737 fleet are designed to contain heat and fire and have a cut-off protection when they reach a certain temperature.

The airline has been using cardboard meal boxes on domestic flights for the past three years.

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# Stop finely chopping and mincing

**F**inely chopping and mincing ingredients can induce the production of PAMPs — bacterial molecules that may be contributing to increased risks of diseases such as coronary artery disease and Type 2 diabetes. Fresh food contains undetectable levels of PAMPs.

Ready meals, burgers and other processed foods have been found to be easily contaminated with bacterial molecules called PAMPs (pathogen-associated molecular patterns). These molecules, which are released by certain types of bacteria as they grow during some food processing and refrigeration processes, may increase our risk of developing conditions such as coronary artery disease and Type 2 diabetes.

PAMPs are undetectable in non-processed and fresh foods, suggesting that they develop during the manufacturing process.

Dr Clett Erridge from the University of Leicester's Department of Cardiovascular Sciences explained: "It has been understood for many years that frequent consumption of

highly processed foods, particularly processed meats, is associated with increased risk of developing a range of diseases, including cardiovascular disease, Type 2 diabetes and obesity. Our recent findings have uncovered a potential mechanism by which certain types of processed food increase risk of developing these diseases.

"In essence, we have discovered that contaminating molecules that arise in processed foods from the overgrowth of a specific type of bacteria during refrigeration or food processing can cause our immune systems to overreact in a manner that might be damaging to health when we eat foods containing these molecules."

After testing volunteers on a diet low in PAMPs for one week, researchers discovered an 11% reduction in white blood cell count and an 18% reduction in LDL (bad) cholesterol — which if maintained would be equivalent to a greater than 40% reduction in risk of developing coronary artery disease.

The volunteers also experienced a reduction in weight (on average 0.6 kg) and waist

circumference (average 1.5 cm). The reductions in waist circumference and white cell count are equivalent to a greater than 15% reduction in risk of developing Type 2 diabetes.

When the same volunteers were fed food enriched in PAMPs, the beneficial changes were reversed, highlighting the negative effect PAMPs appear to have on the health of an individual.

This was an experimental study, which is one of the ways that a relationship between cause and effect can be ascertained.

The researchers believe that their new method of detecting PAMPs could be used by food manufacturers to help identify where in their production process the PAMP molecules are arising in foodstuffs, such as which parts of machinery or which raw materials introduce contamination to their products.

Dr Erridge added: "Crucially, we have found that some processed foods do not contain

these molecules, and our results suggest it should be possible to manufacture almost any current foodstuff in a manner that results in a low content of pro-inflammatory PAMP molecules. Our method can also be used to monitor progress in efforts to clean up the production process.

"The present work suggests that removing these molecules from common foods could provide a health benefit to consumers and suggest a potential means of making some of our favourite foods healthier without any appreciable change to taste, texture, cost or ingredients."

Key processed foods found to frequently contain high levels of PAMPs include foods containing minced meat (including sausages and burgers), ready meals (especially lasagne, bolognese), some cheeses, chocolate and some types of ready-chopped vegetables, such as onions.

Foods containing these as ingredients, such as sauces and sandwiches, were also found to have a relatively high risk of PAMP contamination.

The study suggests that when food is absolutely fresh, including any type of meat, fruit or vegetable, it contains undetectable levels of PAMPs. However, once it has been chopped finely, especially if minced, the PAMP content rises rapidly, day on day, even when stored at refrigeration temperatures.

The University of Leicester's study 'Reduced dietary intake of pro-inflammatory Toll-like receptor stimulants favourably modifies markers of cardiometabolic risk in healthy men' has been published in the journal *Nutrition, Metabolism and Cardiovascular Diseases* and is available at: <http://dx.doi.org/10.1016>. □

## Healthier spaghetti

Spanish and Italian researchers have developed a 'super-spaghetti' of enriched pasta, enhanced with functional flours, which contains more fibre and proteins than normal pasta and helps to reduce the risk of suffering from cardiovascular diseases.

The researchers, who published part of their results in the *Food Research International* journal, have proven that new green technologies (such as the so-called 'air classification') allow processors to obtain functional flours using the whole cereal grain, thus avoiding waste by-products production during the milling process.

Ana María Gómez Caravaca, lead researcher for the project, explains that the air classification process allows the division of milling by-products in two different fractions (coarse and fine) by means of a physical process that doesn't modify the properties of the obtained fractions.

"These fractions have different chemical characteristics due to their different properties, and they will be used depending on the final product we want to obtain. Our work has proven how we can obtain two fractions by air-classifying whole barley flour — one of them is enriched in antioxidant compounds and soluble fibre (especially betaglucans) and the other contains more proteins," the researcher said.

The study results have demonstrated that the fraction used in the elaboration of spaghetti allows the enrichment of the final product in soluble fibre (betaglucans) as well as in catechin-derived antioxidant compounds.

"Comparing the obtained final product with the ones available at the market, we observed that our spaghetti was especially rich in betaglucans. The amount of betaglucans present in our functional spaghetti fulfilled the requirements of the American Food and Drug Administration (FDA) in order to be able to label it as 'good source of fibre' and 'might lessen the risk of suffering cardiovascular diseases'," said Professor Gómez Caravaca, who reported that two Italian companies have developed a new line of pasta using coarse fractions obtained by air classification.



## Automatic wrapper

Mettler-Toledo has released the 880 Auto Wrapper for automatic weighing, wrapping and labelling of meat and fish products in backroom environments.

Suitable for grocery retailers who require a robust, fully automated wrapping station, the wrapper has the capacity for large production volumes, with a compact footprint of less than 1.8 m<sup>2</sup>.

To operate the device, the user places the trays on the infeed tray and the machine's insertion mechanism and centring belt correctly position any that are skewed or angled. The wrapper requires less film than manual wrapping as multiple wraps are not necessary, and the alignment and position of the label is monitored by sensors and can be adjusted using the touchscreen. The wrapper can optionally support labelling on the bottom of the tray.

The film chamber is accessible from the front of the machine, enabling simple roll changes and cleaning. Any offal incurred during wrapping is collected in the base of the wrapper and can be removed by opening the flap in the housing. The infeed tray can easily be removed for cleaning.

Moving parts that could cause injury are guarded with covers and safety stops. The energy-saving mode automatically shuts down the heating element when the machine is not in use.

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## Grand Champion title for Bulla Crème Fraîche

Bulla's Crème Fraîche has been named 2016 Grand Champion Dairy Product at the Australian Grand Dairy awards.

Described by the judges as "a truly outstanding product", Bulla's Crème Fraîche took the title from a starting field of more than 300 dairy products.

Commenting on the win, Nick Hickford, Bulla Dairy Foods' GM – marketing and innovation, said: "We are thrilled to have won this prestigious title. The product came into existence through our partnership with George Calombaris, who collaborated with us to perfect our Crème Fraîche in 2011."

The Grand Dairy Awards put some of Australia's leading dairy producers to the test, recognising excellence, quality and innovation in the industry.

There were 19 category winners in the awards, which are now in their 17th year. Each product was judged by a team of 24 judges who examined the products' flavour, aroma, body, texture, colour and appearance.

The judging panel described Bulla's Crème Fraîche to have a "delicate acidity combined with fresh clean flavours". The product is suitable for sweet and savoury dishes, and does not break or curdle when cooked.

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## Absorbent oven and grill liners

Sirane's absorbent grill and oven liners keep grills and hot food display cabinets clean and attractive, and reduce cleaning time.

Consisting of a highly absorbent material covered with heavy-gauge aluminium foil, Dri-Fresh Fat-Trap grill and oven liners soak away excess fat dripping from the meat while it is cooking or on display – leaving attractive looking food and less mess.

Suitable for rotisseries, hot-food display cabinets, breakfast buffets and other cooking and hot display units, the grill and oven liners can be used for sausages, bacon, burgers and chops, in both domestic and commercial kitchens.

Two sizes are available — 350 x 250 and 250 x 200 mm.

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## Butter sprayer

The Brevda bi m butter sprayer converts butter from solid to liquid spray. The handheld device incorporates touch-controlled design and motion-detecting technology to give users an efficient way to use butter without chemical propellants.

The user inserts butter in the top of the device, then aims and sprays onto their desired food or surface in a steady, even motion. The device only uses the amount of butter required and leaves the rest unmelted. It has a clog-resistant nozzle design and an accelerometer that turns the unit on and off based on its position. The spray reduces the amount of butter consumed — cutting an estimated 50% of the kilojoules normally consumed when spreading with a knife.

The device is suitable for applications including buttering toast, basting turkeys and seafood, flavouring vegetables and popcorn. It can also be used for spraying coconut oil, olive oil or other cooking oils, with or without using butter.

The device uses a high-density rechargeable battery and can be stored in the refrigerator or at room temperature. It can be cleaned using water and liquid soap.

Brevda Inc.  
[www.biemspray.com](http://www.biemspray.com)

## Australian company develops melting potato

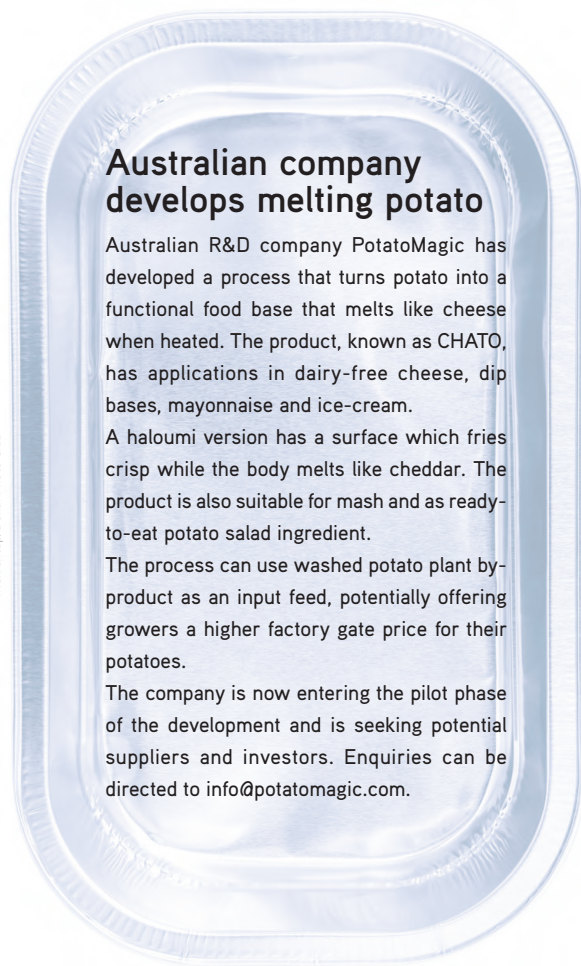
Australian R&D company PotatoMagic has developed a process that turns potato into a functional food base that melts like cheese when heated. The product, known as CHATO, has applications in dairy-free cheese, dip bases, mayonnaise and ice-cream.

A haloumi version has a surface which fries crisp while the body melts like cheddar. The product is also suitable for mash and as ready-to-eat potato salad ingredient.

The process can use washed potato plant by-product as an input feed, potentially offering growers a higher factory gate price for their potatoes.

The company is now entering the pilot phase of the development and is seeking potential suppliers and investors. Enquiries can be directed to [info@potatomagic.com](mailto:info@potatomagic.com).

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# You are what your mother ate

How food  
affects  
gene  
function



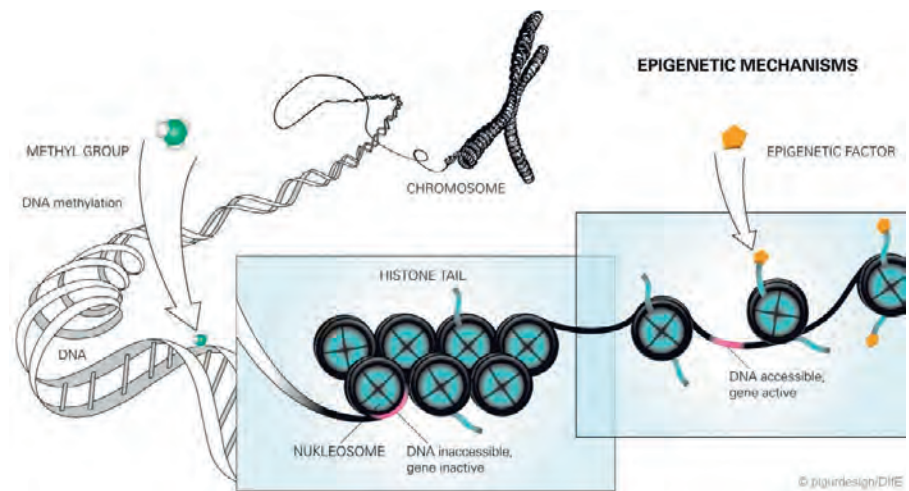
**M**ore and more evidence is indicating that diet can affect gene function and that maternal diet can directly affect an offspring's susceptibility to obesity, diabetes and other metabolic disorders.

In a recent study, a high-fat diet during pregnancy and lactation was found to lead to epigenetic changes in the offspring whereby the adult offspring were more susceptible to obesity and insulin resistance (the precursor to type 2 diabetes). The metabolic pathways affected are regulated by the gut hormone gastric inhibitory polypeptide (GIP).

While this study was on mice, the study leader Andreas Pfeiffer of the German Institute of Human Nutrition (DIfE) asserts that similar mechanisms cannot be ruled out in humans as the maternal diet is not changing the basic DNA structure but rather chemically altering the methylation of the DNA nucleotides (DNA methylations occur when methyl groups bind to the DNA and either activate or inactivate genes).

As scientists throughout the world observe, children of obese mothers have a higher risk of obesity and metabolic disorders. Recent findings suggest that diet-related epigenetic effects may also play a causal role in this. Since humans and mice are genetically very similar, many scientists use mouse models to study such relationships under controlled conditions. Such studies on humans are not possible.

This study focused on the epigenetic effects on the GIP-regulated metabolic pathways that are triggered by the maternal diet during pregnancy and lactation. GIP is a hormone that the gut releases after food intake and which stimulates the secretion of insulin from the pancreas. It influences the metabolism of fat cells and fat oxidation in skeletal muscles and as anabolic hormone promotes the build-up of body mass. These effects are mediated by the GIP via the GIP receptor. If this receptor is lacking as in the *Gipr*<sup>-/-</sup> mouse, the hormone can no longer exert its natural effect, and the animals are normally protected from obesity and insulin resistance. Since the *Gipr*<sup>-/-</sup> mouse model is well suited for the study of GIP-regulated metabolic pathways, the researchers used this mouse strain for their study. The wild-



*DNA methylations (DNA-Methylierungen) occur when methyl groups bind to the DNA. These can either activate or inactivate genes. Nucleosome (Nukleosom): Eight histone proteins form the core of a nucleosome, around which 147 base pairs of a DNA strand are wound. Histone tail (Histon-Ende): The tails of the histone protrude from the nucleosome and can be modified by epigenetic factors. Thus, the binding of the DNA to the corresponding nucleosome is changed, so that the DNA, for example, is accessible to transcription enzymes and a specific gene is activated. Epigenetic factors (Epigenetische Faktoren) alter histone tails eg, by transferring methyl or acetyl groups to lysine side chains. This can hinder or facilitate the activation of a gene. The direct methylation of the DNA permanently changes gene expression when it occurs in the control regions of genes (so-called CpG islets), which are made accessible through the modification of the histones.*

type strain of the mouse model served as the control.

First, the researchers divided the mouse mothers into three groups, who were fed different chow during pregnancy and lactation:

- Group 1: *Gipr*<sup>-/-</sup> mice who received a high-fat diet.
- Group 2: *Gipr*<sup>-/-</sup> mice who received regular chow.
- Group 3: Wild-type mice with intact GIP receptor who received regular chow.

After weaning, all offspring of the three groups were fed normal chow for 22 weeks followed by a high-fat diet for an additional 20 weeks.

As the scientists observed, the adult offspring of groups 1 and 3 gained a significant amount of fat mass during the 20-week high-fat diet although they ate less than the offspring of group 2. They also had heightened levels of cholesterol, glucose and insulin in the blood. In addition, they exhibited increased adipose tissue inflammation and enlarged fat cells and oxidised less fat in their muscles. Furthermore, the researchers found that the activity of different genes was altered in group 1 and 3 in

comparison to group 2. These genes play a role in fat oxidation in muscles and in inflammatory processes in adipose tissue or are involved in the regulation of energy consumption by the brain.

"The altered gene activity could partially be traced back to DNA methylation, that is, epigenetic changes," said Pfeiffer. "Our results indicate that the GIP also plays a role in energy consumption, which is controlled by the brain, probably indirectly by reducing the insulin sensitivity of the hypothalamus," the endocrinologist added. This is an entirely new finding. It remains to be seen to what extent these results can be applied to humans. More research on this topic is needed. However, it is clear that diet not only has a direct influence on the individual, but also may affect the offspring.

Michael Kruse and Farnaz Keyhani-Nejad were the lead authors when this study was reported in the journal *Diabetes*. The study involved scientists from the German Center for Diabetes Research (DZD) in collaboration with researchers from Helmholtz Zentrum München. □

# Social media reveals link between geography and diet



**T**he more difficult it is to access groceries, the less healthy your diet is likely to be — or at least the diet that you're telling the world about. That's the result of a social media analysis that compared the food choices of those living in so-called food deserts — communities with limited access to grocery stores — with those who have easy access to purchase food.

The study, by researchers from Georgia Institute of Technology, found people in food deserts eat food that is 5–17% higher in fats, sugars and cholesterol.

For example, in the north-eastern states of the US, plates would be filled with pork, mayonnaise and cookies in more isolated regions, versus bagels, kale and hummus elsewhere.

The study analysed three million geo-tagged Instagram posts to identify the food choices and nutritional profiles of people living in both types of communities throughout America.

Munmun De Choudhury, an assistant professor in Georgia Tech's School of Interactive Computing, led the study.

"Instagram literally gives us a picture of what people are actually eating in these communities, allowing us to study them in a new way."

The study also identified the 'signature' foods of four additional US regions, comparing the results in food deserts and non-food deserts.

The biggest difference the researchers found was in fruits and vegetables, with 48% of posts from people in non-food deserts mentioning them, versus only 33% in food deserts."

The research team used the United States Department of Agriculture's (USDA) database of nutritional values for nearly 9000 foods to create a nutritional profile for both groups. The number of kilojoules didn't differ significantly, but the levels of fats, cholesterol and sugars were much higher in food deserts, especially in the West and Southwest.

An interesting side note from the study is that pictures of meals that are most likely to be posted by both groups tend to be the staples of each region: steak and coffee in the West; lox and cheesecake in the East; okra and biscuits in the South.

"It doesn't matter where you live," De Choudhury said. "Everyone seems to eat what their region is known for."

The study, 'Characterizing Dietary Choices, Nutrition, and Language in Food Deserts via Social Media', was presented at the ACM Conference on Computer-Supported Cooperative Work and Social Computing on 27 February–2 March 2016 in San Francisco. □

Region	Food desert	Non-food desert
Southeast	Bacon, potatoes, grits	Collard greens, oranges, peaches
Midwest	Hamburgers, hot dogs, brisket	Beans, spinach, kale
West	Pie, beef, sausage	Quinoa, apple, crab
Southwest	Barbecue, pork, burritos	Tomatoes, asparagus, bananas

## Fruit packaging with ethylene absorbency

Sirane manufactures a range of products which incorporate ethylene removal, to extend the shelf life of fresh produce. Ethylene control within packaging can be offered in the form of an absorbent pad, or as a label insert for when standard absorbency is not required.

Sirane's Dri-fresh Resolve 'soft-hold' pad combines the cushioning and protective properties of bubble films with absorbency, high permeability and good presentation. The pads can also have ethylene absorbency incorporated, to extend the shelf life of fresh produce.

The pads are suitable for strawberries, raspberries, blueberries and blackberries and can be provided with antifungal treatment if required.

The Dri-Fresh Resolve pad, which can also be ethylene absorbent, offers a high level of protection and is also 100% compostable.

The Dri-Fresh ABV pad is suitable for soft and delicate fruits, and contains a blend of bio-flavonoids and organic acids which enhance the fruit's own protective defences. The technology can be supplied as standard absorbent pads or incorporated into the soft hold pads, which are cushioned to prevent damage during transportation. The technology is activated by moisture, so it only functions when needed. The pads have both FDA and EU approval.

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## Food manufacturing industry safety guide

Pro-Visual Publishing has released the Food Manufacturing Industry Guide to Safety 2015/16. The guide will assist food manufacturers in addressing and identifying key issues and other requirements affecting food safety, such as allergens, chemical residues and pathogens of foodborne illnesses.

The guide clarifies the various standards, including those set by Food Standards Australia New Zealand, that can apply in the processing and manufacturing of food. It also includes a section which focuses on the definitions of certain terms. This helps food and beverage manufacturers to better understand the rules associated with determining what food products are acceptable.

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# 3D printing of food

The use of 3D printers has the potential to revolutionise the way food is manufactured within the next 10 to 20 years, impacting everything from how military personnel get food on the battlefield to how long it takes to get a meal from the computer to your table.

The price of 3D printers has been steadily declining — from more than \$500,000 in the 1980s to less than \$1000 today for a personal-sized device — making them increasingly available to consumers and manufacturers. Although they are not widely used in food manufacturing yet, that availability is fuelling research into how they can be used to customise foods or speed up delivery of food to consumers.

“No matter what field you are in, this technology will worm its way in,” said Hod Lipson, PhD, a professor of engineering at Columbia University and a co-author of

the book *Fabricated: The New World of 3D Printing*. “The technology is getting faster, cheaper and better by the minute. Food printing could be the killer app for 3D printing.”

3D printing is a good fit for the food industry because it allows manufacturers to bring complexity and variety to consumers at a low cost. Traditional manufacturing is built on mass production of the same item, but with a 3D printer, it takes as much time and money to produce a complex, customised product that appeals to one person as it does to make a simple, routine product that would be appealing to a large group.

For example, users could choose from a large online database of recipes and put a cartridge with the ingredients into their 3D printer at home, where it would create the dish just for that person. The user could customise it to include extra nutrients or replace one ingredient with another.

The US military is just beginning to research similar uses for 3D food printing,

but these would be used on the battlefield instead of in the kitchen, according to Mary Scerra, food technologist at the US Army Natick Soldier Research, Development and Engineering Center (NSRDEC) in Natick, Massachusetts. She claims that by 2025 or 2030, the military envisions using 3D printing to customise meals for soldiers that taste good, are nutrient-dense and could be tailored to a soldier’s particular needs.

“Imagine warfighters in remote areas — one has muscle fatigue, one has been awake for a long period without rest, one lacks calories, one needs electrolytes, and one just wants a pizza,” Scerra said. “Wouldn’t it be interesting if they could just print and eat?”

She noted that there are still several hurdles to overcome, such as the cost of bringing the technology to remote areas, the logistics of making it work in those locations and, perhaps most importantly, making sure the food tastes good.

“If the meals aren’t palatable, they won’t be consumed,” Scerra said. “It doesn’t matter how nutritious they are.”

Anshul Dubey, research and development senior manager at PepsiCo, says 3D printing is already having an impact within the company, even though it is not yet being used to make food. For example, consumer focus groups were shown 3D-printed plastic prototypes of different-shaped and -coloured potato chips. He said using a prototype such as that, instead of just a picture, elicits a more accurate response from the focus group participants.

“Even though the future of food 3D printing looks far off, that doesn’t mean it’s not impacting the industry,” he said. □



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