

Food & Drink

JUNE 2013

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TECHNOLOGY



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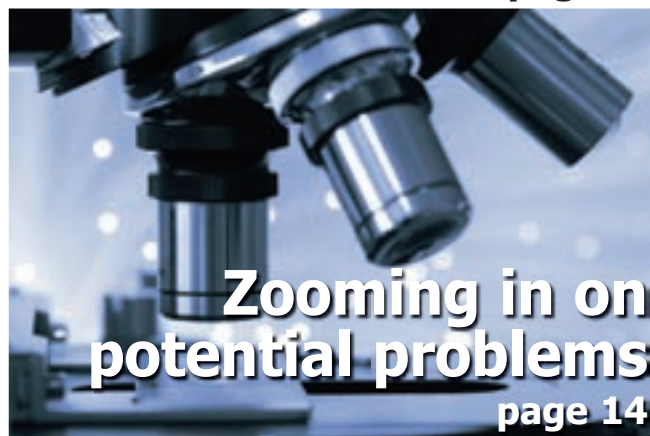
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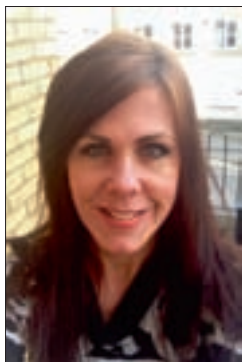
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A change of life

As you'll probably have guessed by the rather dazzling front cover, we at *Food & Drink Technology* are rather chuffed this month, having been granted exclusive access to Sensient Food Colours' plant in Italy.

What an amazing place – with an equally amazing, dedicated team. Find out more about the firm's activities on p21-23.

Elsewhere in the magazine, and tying in nicely with one of Sensient's main markets – that of soft drinks – we look at the trends driving that particular industry sector.

Speaking of trends, on p12, Terry Jones, director of communications at the Food & Drink Federation, looks back at 100 years of industry progress, and all that's been achieved – much of it life-changing.

And, finally, while on the subject of 'life-changing', I'm making a rather

dramatic change of my own. That's because, after more than four years at the helm of *Food & Drink Technology*, I've decided to work for another boss.

She comes highly recommended, loves what she does, is firm but fair and, importantly, isn't averse to the odd long lunch. Who's guessed it? Yes, I'm going to work for myself...

I've had a fantastic few years, met some brilliant people (many of whom I'll be staying in touch with) and wish all our readers and advertisers the very best for the future.

Michelle

Michelle Maynard, Editor



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Cornelius move to 'identify new opportunities for growth'

Speciality ingredients distributor Cornelius Group has announced its membership of the European Association of Chemical Distributors.

"We are an ambitious business and we intend to further develop sectors and countries that we already participate in, as well as identify new opportunities for growth," says Darren Spiby, UK managing director. "We are confident that this move will help Cornelius fulfil its ambition."

Cornelius has operations in UK, Eire, France, Poland, Russia and Scandinavia, and sourcing offices in China and India.

Committed to Courtauld phase three

Members of the UK Food and Drink Federation (FDF) have reaffirmed their support for the third phase of the Courtauld Commitment – a responsibility deal set up to improve resource efficiency, and reduce the carbon and wider environmental impact of food and drink waste.

"Following the progress made so far by FDF signatories under Courtauld Commitments 1 and 2, we look forward to building on this success under Courtauld 3," says Andrew Kuyk, FDF's director of sustainability. "We particularly welcome the focus on food waste reduction, and the recognition that optimised packaging saves waste."

Environmental certification for Sensient

Sensient Food Colours has achieved ISO 14001 certification for environmental management, calling it a 'significant step in its approach to protect natural resources in its manufacturing, logistics and administrative processes'.

"Our certified environmental management system will enable us to minimise energy, water and raw materials consumption, as well as reduce waste and emissions," says technical director Andreas Klingenberg. "This certification demonstrates our commitment to environmental protection in all its processes."



Peanut allergy study is 'first of its kind'

A clinical study commissioned by the UK Food Standards Agency (FSA) hopes to identify, for the first time, how sensitivity to peanut is altered by external factors including exercise and stress.

Peanut allergies affect 200,000 to 400,000 people, and approximately 1 in 50 children in the UK.

The three-year TRACE study will be led by Dr Andrew Clark, allergy consultant at Addenbrooke's – part of Cambridge University Hospitals.

Dr Clark, and his colleagues Dr Robert Boyle and Professor Steven Durham from Imperial College, Dr Isabel Skypala from Royal Brompton Hospital, and Professor Clare Mills from the



University of Manchester, are looking for people with a peanut allergy to participate in the study for a year.

The researchers will invite around 100 peanut-allergic people from a cross-section of the population. These individuals will undergo 'challenges' under varying conditions to find out how sensitivity to peanut is altered by external factors, including

exercise and stress (which in this study will be caused by sleep deprivation).

According to Dr Clark, this study will be the first of its kind globally.

"It will not only bring reassurance to the thousands of people who are allergic to peanuts but also offer a blueprint for improving food labelling for a whole variety of foods," he says.

Britvic job losses 'a bitter blow' says union

Eighteen people are to lose their jobs at Britvic in Belfast, following an announcement that the firm is to close its factory there.

Britvic, which has been operating at the Belfast site for 20 years, will also close its factory in Chelmsford, Essex, resulting in a further 230 job losses.

And 40 more jobs will go with the closure of Britvic's

Pennine Spring factory in Huddersfield.

The measures are part of the company's plans to merge its UK and Irish operations.



Union Unite has called the job losses 'a bitter blow' both for the workforce and local economies.

"The threat to the jobs at the three sites is a very bitter blow for the workers and their families," says Jennie Formby, Unite national officer for food and drink.

"Unite will be doing all it can to support our members through this difficult period."

Strategic alliance offers support from 'seed to shelf'

In the wake of ever-closer integration of farming and food manufacturing, science-based organisations Campden BRI and CABI have developed a strategic alliance to provide technical support from 'seed to shelf'.

The alliance is designed to benefit small, medium and larger companies, as well as initiatives from government and NGOs aimed at supporting food production.

"The food supply chain faces enormous challenges in meeting the needs of a growing and more affluent population – all within the constraints imposed by sustainable production of safe



and wholesome food," says Professor Steven Walker (pictured), director general of Campden BRI. "Science, technology, knowledge and their practical application will be absolutely crucial in meeting these challenges."

The alliance between CABI and Campden BRI

will combine the power of over 600 experts in key areas, such as sustainable agronomy, post-harvest technology, food processing and preservation, packaging, hygiene and safety assurance.

It will also draw on their extensive skills in information, publishing, knowledge management and training to ensure that the latest research and innovation is identified and practically applied.

"The days when agriculture and food processing are seen as separate activities are fast disappearing," adds Walker. "If we are to meet the challenges of tomorrow, we need to take an integrated approach to the supply chain."

DSM in Andre Pectin deal

DSM has signed agreements to acquire a 19 per cent equity interest in Yantai Andre Pectin, a China-based producer of texturing ingredients.

In addition, the parties have agreed that DSM has option rights to increase its stake in Andre Pectin to a majority stake at a later stage.

The agreements are subject to customary approvals and certain closing conditions, including the approval of the selling party's shareholders.

Andre Pectin, headquartered in Yantai (Shandong Province, China), was established in 2003 and is active in the manufacturing and sale of apple and citrus pectin, a key food ingredient providing texture, as well as pectin-related health supplements.

EU votes to ban flavouring substance

The European Commission and European Union member states have declared that the flavouring substance 3-acetyl-2,5-dimethylthiophene should be banned.

"The flavouring substance 3-acetyl-2,5-dimethylthiophene is genotoxic (that is, it can damage DNA, the genetic material of cells) and is, therefore, a safety concern for human health. Genotoxic substances should not be intentionally added to the food chain", says a scientific opinion and press release recently published by EFSA.

While EFSA did not undertake an exposure assessment, it stated in its press release that 'the possible risk to consumers who may have been exposed to this substance in food is expected to be very small'.



The substance 3-acetyl-2,5-dimethylthiophene is used to give food a burnt, nutty flavour. It is produced by a small number of manufacturers and its overall use is low (total annual use in the EU is reported to be 2.3kg).

The Food Standards Agency has been informed that the UK food industry uses only a small amount of this substance and is

already reformulating foods that contain 3-acetyl-2,5-dimethylthiophene.

The decision to remove this substance from the list of approved flavourings was supported by all member states, and will now be subject to scrutiny by the European Parliament and Council.

It is expected to be adopted by the European Commission and come into force in July.

Nestlé Professional to expand French factory

Nestlé Professional – the Nestlé business that supplies the food services industry – is investing £25 million (€40m) to extend its Davigel factory in Noyal-Pontivy, France.

According to the firm, the investment – which will create 90 permanent jobs – will enable it to 'further develop its range of nutritionally balanced meals for hospital patients'.

Davigel, a provider of frozen and chilled food solutions, already supplies meals to a number of hospitals and healthcare institutions in France, where more than 990 million meals are served to patients every year. ▶

Cereals set for success in Japan

Breakfast cereals will grow ahead of the sector trends, as Japanese consumers begin to replace their traditional breakfast foods, says a new report from Canadian.

“With value and volume CAGRs (Compound Annual Growth Rate) of 2.8 per cent and 2.2 per cent respectively, the bakery and cereals sector will be one of the slowest growing sectors in the Japanese food industry between 2012 and 2017,” says a spokesman for the market analyst.

“In contrast, during the same period, breakfast cereals will grow at value and volume CAGRs of 4.4 per cent and 3.9 per cent respectively, ahead of the sector.

“In some areas, the category will begin to replace the traditional breakfast foods to which Japanese consumers are accustomed.”



Soda-Lo celebrates patent success



Tate & Lyle has been granted a patent in the US for its Soda-Lo salt microspheres, and the process used to make it.

Soda-Lo is, says the manufacturer, ‘a new salt reduction ingredient that tastes, labels and functions like salt because it is salt’.

“With Soda-Lo, food manufacturers can reduce salt levels by between 25 and 50 per cent in various applications without sacrificing taste,” says Angelique Gunderson, of Tate & Lyle. “The technology turns standard salt crystals into free-flowing crystalline microspheres. These lower-density crystals efficiently deliver salty taste by maximising surface area relative to volume.

“And because Soda-Lo is made from salt, it has none of the bitter aftertaste or off-flavours associated with some other salt compounds or substitutes.”

Waitrose vows to halve packaging in next three years

UK retailer Waitrose has announced plans to cut its packaging in half by 2016. It has also revealed three major changes to its product ranges that it says will save nearly 100 tonnes of packaging each year.

The *Menu from Waitrose* range of prepared meals has been relaunched with a full redesign and packaging update for all of the 49 products within the range.

The width of the sleeves on the outside of the products has been decreased, resulting in a reduction of 33 tonnes of packaging per year – equivalent to a 20 per cent overall weight saving.

The retailer has also introduced aluminium trays, lacquered both internally and externally, for ready meals. This means that customers can cook and serve the meals in the same tray and are still able to recycle it after use.

The *Good to Go* range of 190 snacks and sandwiches



has also been relaunched, with packaging reductions totalling 25 tonnes per year.

Changes include increasing the size of the clear window on sandwiches to allow better visibility of the product, cutting 11 tonnes of packaging per year. And preprinted bags for fruit portions have also been developed, saving 60 per cent of the weight by taking off the label.

Finally, ‘flow wrap’ packaging has been gradually rolled out for all meat. By removing the plastic tray in the packs of pork and lamb,

Waitrose says it will cut back on 38 tonnes of packaging a year – a 70 per cent saving.

“We are always working hard to reduce packaging where we can, to decrease the waste reaching our customers’ bins and ensure they can recycle as much as possible,” says Waitrose packaging and reprographics manager Karen Graley.

“Relaunching a range is a fantastic opportunity to do this, and cutting packaging by nearly 100 tonnes per year is a great result to have achieved on our journey to halving packaging by 2016.”



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Glanbia dairy plan will create 1,600 jobs

Dairy ingredients company Glanbia Ingredients Ireland has announced plans to build a new dairy facility in the country, creating around 1,600 new jobs.

The Department of Jobs, Enterprise and Innovation will partly fund the development of the dairy plant via Enterprise Ireland. Glanbia in Ireland currently processes 1.6 billion litres of milk into dairy ingredients that are exported to more than 50 countries.

Construction of the new Belview dairy plant is set to begin in mid-May, with Glanbia aiming to begin production in spring 2015. All produce from the new facility will be destined for export markets.

"The Belview facility is a significant, strategic development for our business," says Glanbia CEO Jim Bergin. "Most of all, it reflects our confidence in, and commitment to, our milk suppliers. By providing this additional processing capacity, we will be facilitating milk suppliers in taking advantage of the opportunity presented by quota abolition post-2015."

Indian factory for Tetra Pak

Tetra Pak has announced the inauguration of its latest factory at Chakan, near Pune, in India.

The plant will meet growing demand for processing and packaging solutions across India, Asia and the Middle East, says the firm.

November date for aspartame opinion

EFSA and the European Commission have agreed to extend the timeframe for the full re-evaluation of aspartame, rescheduling it for November this year.

The decision will, says the safety authority, allow it sufficient time to consider and address feedback, including new information, resulting from the public consultation on its draft opinion.

From the comments received, experts on EFSA's Scientific Panel on Food Additives and Nutrient Sources Added to Food say they have identified aspects of their draft opinion and key steps



in their approach that they would like to clarify further before finalising their scientific conclusions.

"This will ensure that our advice fully integrates

information received, and that those with an interest in this work will be able to understand how the panel reached its conclusions," says an EFSA spokesman.

EC to restrict 'bee death' pesticides

The European Commission is to restrict the use of pesticides alleged to cause bee deaths.

There is concern across Europe about the collapse of bee populations, with neonicotinoid chemicals in pesticides believed by many to be the cause of the problem.

As a result, the European Commission says they should be restricted to crops not attractive to bees and other pollinators. But many farmers and crop experts argue that there is insufficient data.

Fifteen countries voted in favour of a ban – not enough to form a qualified majority. According to EU rules, the Commission will now have the option to impose a two-year restriction on neonicotinoids – and the UK cannot opt out.

The UK did not support a ban, arguing that

the science behind the proposal was inconclusive. It was among eight countries that voted against, while four abstained.

Wild species such as honey bees are said by researchers to be responsible for pollinating around one-third of the world's crop production.



Fresh bread solution in the bag

In the continued fight against food waste, Flexico Group is set to launch a packaging solution in the UK that it says will keep bread fresher for longer.

The Cordogrip double drawstring bag is designed with a top and bottom gusset, and is fitted with two strings in colours that can match any brand logo. Pulling the top string in the opposite direction to the bottom string closes it. The bag can then be opened by pulling the sides of the bag, above the strings, apart.

"With manufacturers of bread products competing with each other for a share of the market, a product available in a consumer-friendly format can make the product more appealing and potentially more saleable," says Paul Francis, of Flexico UK.

Let's be ever-alert to lone wolves (and badgers)

Recent weeks have been filled with fantasy, excitement and horror. Thankfully, however, this is not typical for me. Yet a common thread links all the events.

A red-top tabloid newspaper in the UK reported on threats to intentionally contaminate milk in three high street food retailers. The threat, by a pressure group, was to raise awareness of the proposed badger cull to prevent the spread of bovine TB.

Within my usual timeframe of less than a minute, I found two references on the Leatherhead News database that, despite its origin, gave a level of credibility to the story.

A couple of days earlier, I was on a train in London reading a free newspaper, and came across an article about political pressure and e-petitions, specifically regarding a cull of badgers and bovine TB.

Later that day, I wrote a briefing note on previously reported incidents in which pressure groups had threatened to contaminate food as a way to voice their concerns, and generate publicity for their cause.

We have a 30-year history of such behaviour and, thankfully, the 'threat' to contaminate seems sufficient to generate media coverage and economic damage without putting the health and wellbeing of consumers, often their supporters, at risk.

What we do know is that simple notes or messages on or inside packets and jars often planted at retail level – generally false but equally intimidating – are taken very seriously.

The 'lone wolf' ideologically motivated individual or disgruntled employee has been flagged as our biggest threat in the food supply chain for a number of years. An orchestrated and coordinated plan across multiple cities and retailers, where the threat to 'threaten' is real, would cause tremendous food waste, panic-buying and chaos.

My colleagues at Leatherhead set about planning a testing protocol for unknown contaminants in dairy products that had been maliciously and intentionally introduced along the traditional

Professor Tony Hines, head of food security and crisis management at Leatherhead, has had a month of fantasy, excitement and horror



supply chain of farm to supermarket checkout. To stick with my rural theme, needle and haystack spring to mind. Fantasy and threat. A couple of arrests soon helped to restore the status quo.

Horror

Horror came to all our lives recently, with the murder of a soldier in Woolwich, south-east London, UK.

Any attempt I make to share advice and best practice on keeping our food safe from the 'bad, mad or sad' falls into insignificance when we consider the challenges our security services face when it comes to intelligence and evidence-gathering.

People – not the contaminant – are our threats. Control your people, watch for the lone wolf and minimise access to raw materials, production and cleaning materials. Above all, intelligence-gathering and evidence is critical. Never be afraid to share real concerns with the authorities.

Excitement

Excitement came in the form of Horizon Scan, the new Leatherhead and Food and Environment Research Agency (Fera)

'bundle of databases' at the Leatherhead food safety open day.

With the 'wild card' and 'fraud' databases now embedded into the system, I was apparently like a 'child with a new toy' demonstrating and challenging attendees with commodities (hundreds), countries (global) and contaminants (everything from mycotoxins, veterinary drug residues, pesticides, heavy metals and foreign bodies). Two whole hours of amazing some of the biggest food groups in the world with its capabilities. Fabulous.

After two years, when my aim was to develop a system with Fera so that the computer would do most of the work and 'horizon scan' for me, job done, I thought. I then drove home and heard the ghastly news that the soldier wearing a *Help For Heroes* t-shirt had been murdered.

Recently, I waived my fee at a major food group's annual staff conference, as they were raising money across their business for the Help For Heroes charity. May that soldier, Lee Rigby, rest in peace and may the food industry be ever-alert to lone wolves. ■

An appetite for progress



For members and staff at the Food and Drink Federation (FDF), 2013 is a special year. It marks FDF's centenary year, providing an opportunity to take stock and celebrate all that the food and drink industry has delivered for consumers, the economy and society over the past 100 years.

Food and drink manufacturing has been a real British success story of the modern age. Against a backdrop of profound political, social and economic change, our sector has grown into the largest in UK manufacturing, employing 400,000 people and contributing £20.6 billion (€24.3bn) in Gross Value Added to the economy.

The industry has also been responsible for many of the life-changing innovations that we have seen in the past century. Product, process and packaging innovations, coupled with an unstinting focus on the consumer – all underpinned by food safety legislation – have enabled the industry to create and distribute increasingly safe, nutritious, convenient, sustainable and affordable foods.

To bring this to life, FDF is building an interactive timeline that will explore those developments in a historical context, what they meant then and continue to mean for consumers today. Already we've been able to see that the catalogue of often quite small changes has made a big difference.

Advancements in food science in



Terry Jones, director of communications at the Food and Drink Federation, looks back on 100 years of industry innovation

post-war Britain also resulted in the development of processing techniques to ensure safety, prolong shelf life, improve palatability and enhance nutritional value in products.

New technologies and processes such as freezing, chilling, pasteurisation and canning became available at a time of great social change in Britain. Changing work patterns and the rise of dual-income households created a demand for convenience food to cater for people with limited time to prepare three meals a day, every day.

One hundred years ago we spent approximately half of our household income on food; today it's around 10 per cent. In the last 50 years, the time we spend preparing food has halved. Rates of foodborne illness have also been massively reduced.

The changing environment and consumer attitudes towards sustainable behaviours have also changed, revolutionising the way manufacturers source, produce and package goods.

New technologies and investments in changing recipes have led to big reductions in the levels of salt, saturated fat and calories in some of our much-loved brands.

But which development from the last 100 years do you think has made the biggest difference for consumers? Was it the fridge or the microwave? Aluminium foil or PET? The Chorleywood Baking



Terry Jones

Process or pasteurisation? Or something completely different?

As the industry dusts itself down after the horsemeat scandal – and prepared and packaged food faces criticism for everything from its perceived role in increased rates of obesity to the impact of its production on the environment – reflecting on what the industry has done for consumers should be a worthwhile exercise. It may even provide lessons for the future as we consider how the industry will respond to societal challenges.

Are you aware of any historical or societal shifts that changed the way food is manufactured? Do you know of any technical advancement that improved food safety in the last 100 years? Have you got a view on which industry development has transformed consumers' lives? If so, please drop me a line at terry.jones@fdf.org.uk. ■



'The food and drink industry has been responsible for many of the life-changing innovations that we have seen in the past century'



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Zooming in on potential problems

Microscopes were developed to look at things that were too small to see with the naked eye, and that used to be all. But nowadays they do so much more, and can be combined with specific analytical techniques (such as spectroscopy), allowing detailed information to be gathered on the chemical composition of the object being viewed.

This article illustrates how two different approaches to analytical microscopy have practical applications for the food and drink industry – Fourier transform infrared (FT-IR) microscopy and scanning electron microscopy (SEM) x-ray microanalysis.

FT-IR

Infra-red spectroscopy has been an important analytical tool for many years, but recent advances have increased its usefulness.

Application of Fourier transform techniques to the results has lowered the detection limit from the microgram to the nanogram range, and from the ppm to ppb level. Meanwhile, sample presentation has been greatly simplified with the introduction of Diamond ATR (Attenuated Total Reflectance) sampling.

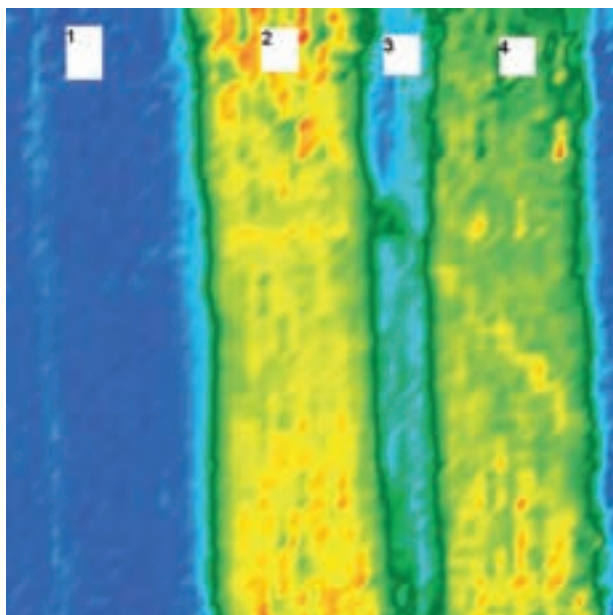
Infrared spectroscopy is based on the interaction of specific wavelengths of infrared light with particular chemical bonds in the material being studied, particularly organic molecules.

Mike Edwards, microscopy manager at Campden BRI, reveals how modern microscopy can help troubleshoot a range of industry dilemmas

Individual bonds, such as C-O, C-H or C-N, absorb infrared light at a particular wavelength. Illumination of a molecule will produce a spectrum of peaks, and each peak can be related to a particular type of bond. Individual spectra thus provide a 'fingerprint' of individual molecules.

This can be used in the identification and verification of incoming product, determination of adulteration (eg palm oil addition to virgin olive oil, or margarine addition to butter), contamination and origin studies, and quality issues (such as sugar/acid ratio in tomatoes), as well as to identify the chemical composition of foreign bodies.

FT-IR microscopy can be used to study the chemical composition of very small samples (micro-sized), in effect using a microscope to apply FT-IR spectroscopy



to those microscopic samples. However, its most valuable application is in the chemical mapping of a sample of varying composition, so that the chemical identity of particular components can be determined.

This can be used to study food materials, such as wheat grains, where chemical

mapping shows the distribution of protein, starch, cellulose and phenolics.

FT-IR microscopy can also be used in the analysis of multilaminar plastic packaging materials, which are made up of a number of different, very thin layers, each of which has a specific purpose.

When problems are encountered with such materials – for example, if a lidding film will not seal adequately to a food tray – it is important to be able to analyse the different layers to check them against the manufacturer's specification. A cross-section is therefore cut from the film and examined under the microscope.

The traditional approach in identifying the chemical nature of layers (of packaging or food) would be to take spectra from each layer in turn, but the development of a focal plane array detector with up to 128 x 128 separate elements means that spectra can now be acquired simultaneously across the whole sample to give a chemical map of the layers.

In addition, layers as thin as 1-2 microns can now be analysed, following the development of a Germanium Attenuated Total Reflectance objective, in which a germanium crystal is pressed up against the sample, increasing the resolution fourfold.

Scanning electron microscopy

The SEM gives pseudo-three dimensional images with higher magnification and greater depth of focus than a light microscope. Samples can be relatively easily prepared and quickly examined in the SEM, making it an invaluable tool for the rapid examination of the three-dimensional structure of many samples.

This technique is put to good use in texture assessments, for example during a product development programme. Different formulations for products such as biscuits or savoury snack foods often have very different textures or mouthfeels.

Getting the right texture is a key part of producing an acceptable product. The SEM can be used to examine the structure of a biscuit, for example, and assess whether specific ingredients are associated with crumbliness or lack of cohesion.

Sugar crystals are often associated with these characteristics, and the SEM can reveal whether there is an uneven distribution of crystals or other components, and whether this can be related to where and how the product crumbles.

Overall crispness of snack products is also related to the relative levels and distribution of individual components. The SEM can be used to relate the microstructure of the

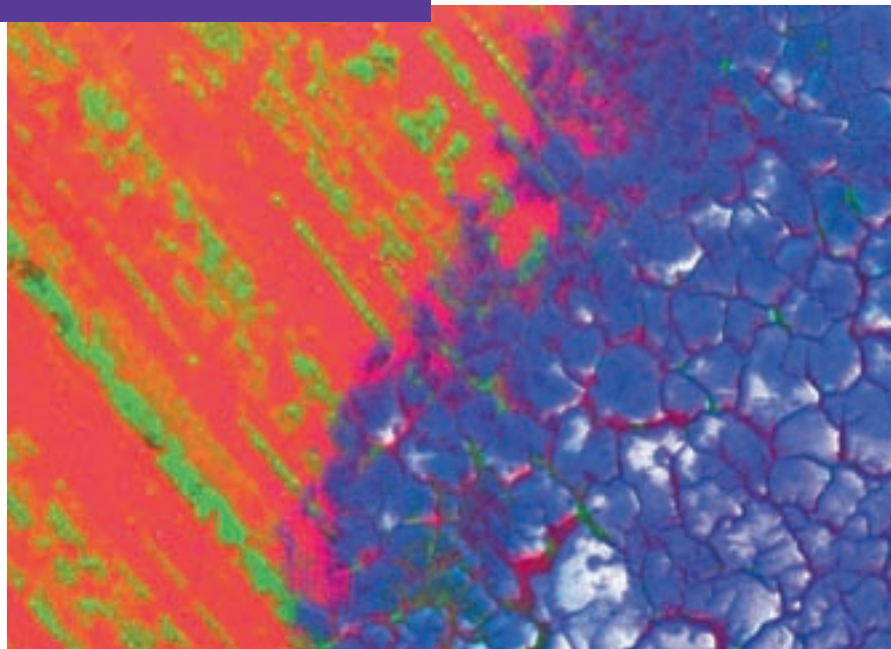
product to this characteristic.

More detailed microanalysis of SEM samples may be carried out using an energy-dispersive x-ray microanalyser. Whereas FT-IR analyses the spectra associated with chemical bonds and is therefore primarily useful for organic materials, x-ray microanalysis is related to the elemental composition of a material.

The energies of the x-rays given off by a sample irradiated with an electron beam are characteristic of the elements present in the sample, and so the x-ray microanalyser can be used to give a quick, non-destructive elemental analysis of the sample.

This means it has wide applications for the food scientist. It can be used to look at the distribution of salt and calcium phosphate crystals in cheese, or milk solids in chocolate. It can be used to determine such things as the mineral composition of a substance, such as the nature of glass found

'Modern microscopy is a sophisticated science'



as a foreign object in food.

Different types of glass have different levels of elements such as sodium, aluminium, magnesium, lead and calcium – and so can be distinguished by their 'elemental fingerprint'. It can also rapidly identify samples erroneously reported as glass, such as struvite (magnesium ammonium phosphate), salt and silica.

As well as foreign body analysis, the SEM x-ray microanalysis combination is particularly useful for investigating packaging defects such as can corrosion.

When a can corrodes, it is usually due to the presence of elements other than iron and tin (ie elements that shouldn't be there). SEM can be used to assess exactly where

the corrosion has occurred, and where it might have originated. X-ray microanalysis is then used to determine what unusual elements are present.

In a recent investigation, we found that pinholes down a can side seam were related to the presence of traces of copper from the welding operation when the can was made. This, in effect, set up an electric cell that led to the corrosion.

Rusting of cans is often linked with the presence of chlorine and sulphur, and sulphur (or sulphide) staining is caused by a reaction between hydrogen sulphide – produced by the breakdown of food proteins during heat processing – with the metal. This can be analysed by x-ray microanalysis.

Recent developments in scanning electron microscopes include variable pressure SEMs and environmental SEMs.

A variable pressure SEM avoids the need for coating a sample with gold or carbon to give an electrically conducting surface, normally required to avoid a build-up of electrical charge on the sample.

A carefully controlled partial vacuum

inside the microscope acts as an electrical earth for the sample, although a somewhat poorer image can result. This means that most food or packaging samples can be examined with virtually no preparation.

The environmental SEM allows control of not only the vacuum, but also the humidity inside the chamber. This allows wet samples to be examined, which is extremely useful where food samples are concerned.

As these examples show, modern microscopy is a sophisticated science. The microscope can be linked to other instruments and used to research a wide range of practical problems of direct relevance to the food and drinks industry. ■



Drinking to health

Dr Helen Payne, senior food safety adviser at Leatherhead Food Research, looks at ingredient trends and subsequent safety considerations

As with the majority of the food industry, the beverage sector undergoes continuous innovation to produce novel and in-demand products.

With the development of products containing new ingredients, however, comes new food safety challenges. For example, with bubble tea and powdered beverages emerging on to the European market, it is important to be aware of the safety and stability challenges that these innovative products present.

Common problems

Micro-organisms often originate from the raw ingredients and then either persist throughout the process, or from where cross-contamination occurs.

Yeasts and moulds, and to a lesser degree bacteria, are typically the problematic spoilage micro-organisms in beverages. These produce an undesirable appearance, smell or taste in the product.

Spoilage by yeasts can lead to the production of large amounts of gas, leading to distended or ruptured packs, with fruity, alcoholic notes, often with a sediment in the product.

Spoilage by moulds is very much visual, with the formation of mats on the surface of the product, coupled with enzymic breakdown, causing separation.

Problems with pathogens are more unusual with beverages, although they do occur occasionally. With the changing face of products there is the potential for new pathogens. For instance, with dry powder products, bacteria such as *Salmonella* spp. can persist for long periods. However, there is an opportunity for food safety expertise to be drawn from other sectors, where these pathogens are routinely considered.

New ingredients

Innovation often starts with the raw ingredients. Even within fruit-based ingredients, an increasing interest lies within the more exotic fruits. From a food safety perspective, these fruits do not have the natural high acidity of the more commonly used fruits.

In addition, they can also contain different micro-organisms, and thus require a modified approach to produce a safe product. For example, some moulds demonstrate notable resistance to heat, and can survive the typical thermal processes applied to most soft drinks.

However, drink ingredients stretch far beyond fruit: herbs, spices, tea, dairy, cereals (both fermented and unfermented), plant extracts and infusions are all commonly utilised ingredients in ready-to-drink and concentrated beverages.

'To ensure a safe product, new ingredients should be assessed individually on a risk assessment basis to identify potential hazards'

Health trends have also seen an increase in fortified beverages on the market; vitamins, minerals and even omega-3 oils are being added to beverages so that health claims on products can be made. Completely new beverages have also emerged onto the world market – coconut water, for example.

With the development of new products or applications comes an increased range of safety concerns. For instance, tea and spices have a relatively high microbial load originating from the harvesting and processing methods they undergo. For plant extracts, these are often perceived as natural and healthy, and are often promoted in natural energy drinks.

However, plant extracts can be susceptible to contamination with chemicals, both those intrinsic and from external sources. These risks should be considered when sourcing and using these materials; to ensure a safe product, new ingredients should be assessed individually on a risk assessment basis to identify potential hazards.

Leatherhead Food Research often undertakes the identification of spoilage micro-organisms from food and drinks, where an organism has been brought in through the incorporation of new ingredients, or a change in ingredient sourcing.

As the contaminating micro-organism may not have been encountered previously,



the processing and formulation of the beverage can be insufficient in preventing its growth and/or survival.

Identification of the source of the problem can be a time-consuming and challenging process, so a preventive approach is always the ideal option.

Modifying formulations

It is not just the ingredients that are changing; levels of existing compounds are also under adjustment.

Consumer health drivers include the reduction of sugar in products, with sweetness being generated by the addition of commercially available intense sweeteners.

Sugars can be a limiting factor for the growth of some micro-organisms, as high amounts of sugar means that there is less available water in which to grow. Substituting intense sweeteners for sugars means that a wider range of organisms can potentially grow, thus, alternative control strategies then need to be put in place.

Often this means the addition of preservatives to the beverages; typically sorbates, with or without benzoate. Preservatives are not the solution to all problems; some yeasts and moulds show notable resistance to sorbates, even when applied at levels near to the EU legal limit.

Further to the concept of clean labels, preservative-free products are of increasing interest across the food industry. Yet, the continuing desire for products with a long shelf life still exists, leaving somewhat of a paradox for beverage preservation.

Changes in the formulations also mean that the processing conditions for the product need to be reconsidered.

At Leatherhead Food Research we see a lot of member and client interest around processing conditions and technologies, both heat-based and otherwise, as well as suitable preservation strategies for beverages.

Our new pathogen pilot plant facility, DirtyLab, permits the validation of processing conditions in products against known micro-organisms, without a risk of contaminating the factory environment.

It is important to be aware that incorporation of new ingredients or a change in beverage formulation can have an impact on the product's safety and stability. ■



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Artisan distribution solution from Tilia

Online home delivery service Tilia has just launched in the UK.

Founded by Rob Ford, a former City worker turned food entrepreneur, Tilia is based on his belief that 'the best produce comes from artisans with skill, provenance and passion'.

Ford says he wanted to create a way to champion individuals and small,

independent businesses, while making food and drink of 'unparalleled quality' widely available.

"When I moved to London



I was exposed to the great British produce available from the amazing artisans all around me," says Ford. "I knew that it was difficult for people living outside of these areas to regularly access this amazing food and drink, and so I wanted to create a solution that connected these businesses with all food-lovers – Tilia became that solution."

Princely proposal for tuna market

UK fish brand Princes is investing £319 million (€375m) in the ambient tuna market by launching a tuna in tomato sauce product, and a range of sandwich fillers.

Tuna is the largest market in ambient fish, and Princes says it's bringing innovation to the category by launching its tuna chunks in tomato product this month.

"The launch aims to increase frequency of purchase of canned tuna by providing



consumers with a wider product choice of healthy options, and attracting those shoppers who buy tomato-based oily fish variants," explains marketing director Neil Brownbill. "Tomato-based variants account for more than 57 per cent of volume in oily fish, and the new product will fill

a gap in the market for the popular flavour."

The deli-inspired sandwich fillers, meanwhile, will be available in resealable pots in four variants – Tuna Tikka Mayo, Tuna Thai Mayo, Tuna Mediterranean and Tuna New York Deli.

CP gets serious about snacking

CP Foods UK has launched Taste Inc – a new range of snacking products.

The chilled, micro-waveable range, has launched in garage forecourts and convenience stores across the UK, with plans to roll out to the multiples in the near future.

Products in the range include a chicken and mayonnaise sandwich, chicken and chorizo baguette, and a quarter pounder burger.

The new brand is part of a multi-million pound investment programme of growth by CP Foods UK, including an extension to its Newmarket factory that will produce Taste Inc.

"We're experts in producing added value food products using CP Foods' quality poultry and seafood for the major supermarkets and foodservice industry," says Chris Wenham, commercial and marketing head at Taste Inc.



Mariani in Selfridges scoop

Premium beef jerky manufacturer Mariani Foods has secured a deal with UK department store Selfridges to supply its London, Birmingham and Manchester stores with a bespoke range of products for its delicatessen counters.

Mariani Foods has created three varieties – Original, Bulgogi (a sweet teriyaki-style) and Spicy Chilli (exclusive to Selfridges).

The product will be hand-sliced in front of the customer and sold at approximately £6 (€7) per 100g.

"We are delighted to be the exclusive supplier of beef jerky to Selfridges," says Don Nisbet, managing director of Mariani Foods. "This is testament to our product's premium quality."

Amy's additions

Family-run food brand Amy's Kitchen has added two new dishes to its range of frozen, free-from ready meals available at Asda – Indian mattar paneer and gluten-free vegetable lasagne.

The dishes are available from this month.



Sunny new flavours

Juice drink Sunny D has added two new flavours to its range.

Orange & Raspberry and Orange & Passionfruit versions of the drink have been added to meet growing customer demand, says the firm. The drinks have also been reformulated and now contain vitamins A, C, D and E.





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'We colour the world around you'



When Sensient Colours invited Michelle Maynard to become the very first journalist to be let through its doors, it was an offer too good to refuse...

Tucked away down the winding road of the Corte Tegge industrial estate in Cavriago is an anonymous-looking building that gives little clue as to what goes on behind its white façade.

But venture beyond the gleaming glass doors, and you'll discover one of northern Italy's best-kept secrets.

For here, in the heart of an agricultural red wine-producing community, is Sensient Food Colours (SFC) Italy – the largest European producer of red natural food grade colours, more commonly known as anthocyanins.

It's an operation run with military precision, in both raw material selection and prompt collection of the grape skins.

"We are actively involved in primary extraction from raw materials, which is very important for traceability and safety," explains managing director Imerio Bortot. "We also like to be part of the local agricultural community, and work very closely with the wine producers."

The company deals mainly in red shades from grape skin extract (E163) and black carrot.

"The region is very important for dark red wine production," says Bortot. "During the grape harvest, we have just a six-week window to organise the transport and processing of the raw materials."

Those raw materials, which for wine-makers are a by-product, consist of two grape varieties – lambrusco and ancillotta – both used for their rich, strong colour.



“Time is of the essence as we need to secure the quality”



Extraction

Sensient uses two different extraction processes at its 22,000m² Corte Tegge site.

Traditional extraction is carried out with the aid of 160 fibreglass tanks and eight sieving machines for seed separation.

Continuous extraction (suitable for muta grape skins only) involves the use of two thermodynamic countercurrent extractors – built by Sensient's own engineers using proprietary technology.

Ninety per cent of the colour content is extracted in less than one hour, with the exhausted skins – and seeds – then sold on for biogas. "We don't waste anything," declares Bortot proudly.

After the extraction process comes evaporation and purification, before the product is then blended in mixers ranging in size from 1m³ to 22m³.

Liquid filling takes place on one of two lines – a dedicated filling line for packs of

Bortot is in regular contact with the wineries dotted around the region, in order to assess the quality and quantity of the harvest. The region is, he says, very important for dark red wine production.

"We are embedded in the local north Italian agricultural wine-producing community, and focus on local sourcing, environmentally friendly production, short transport and the production of all grape derivatives – grape seeds for oil, tartaric acid and alcohol – with the exception of wine," he says.

"The raw material selection is vital, as is prompt collection of the skins once they've been pressed. During the harvest, we work 24 hours a day, seven days a week."

During that time, hundreds of dedicated and controlled trucks will pass through Sensient's doors, with more than 1,000 tonnes of materials processed each day, and 5,000 hectolitres of liquid.

Such a punishing schedule is vital, however, if the firm is to defeat its arch enemies 'oxidation' and 'microbiological activity'. As grape skins are a natural product, the colour and quality will quickly fade if they are not processed sufficiently quickly.

"When our trucks arrive with the grape skins, they are weighed and then sent to the appropriate production line, and processed in less than six hours from the time they left the vineyard," says Bortot.

"The six-week window for a harvest is like a Champions League Cup Final – there is no second chance. Time is of the essence as we need to secure the quality."

Did you know?
If all the anthocyanins produced by Sensient in Italy each year were used in a red soft drink, the bottles placed end to end would circumnavigate the globe five times





“Ninety per cent of the colour content is extracted in less than one hour”

between five and 50kg, and an Alfa Laval aseptic filling line for customised packaging from five to 1,250kg bags.

The finished powder product has a shelf life of 24 months, and the liquid, nine months.

In terms of storage space, the site is able to accommodate finished goods in its 600m² warehouse. There is also a 200m² ingredients warehouse and cold store.

“We produce a full range of superior performance anthocyanins with colouring food-stuff properties,” says sales manager Alberto Forlini. “Our products are both liquid and powder, and come in different colour shades and strengths.”

Anthocyanins are water-soluble, natural colours widely used in the food processing industry. They are, however sensitive to pH change; they’re red in acidic conditions – where they are most stable – and

change colour as the pH increases.

“That’s why we carry out in-house stability testing, and also assist with scale-up,” adds Forlini. “Our R&D laboratory allows us to analyse and select high quality sources of raw material, and then develop innovative, formulated colour systems.”

Looking ahead, the firm says it has high hopes for the continued success of its products, as enhanced stability properties make for new applications, with a range of vibrant shades possible.

That means for Sensient, the future is, as they say, bright. Very bright indeed. ■



Grape skin extract: the benefits

- Strong, dark red colouring
- High light stability
- Transparent/low-turbidity
- Attractive price/performance ratio
- 100 per cent natural, meeting FDA and EU regulations
- Contains antioxidant polyphenols

Main applications

- Low alcohol beverages
- Soft drinks & fruit drinks
- Confectionery
- Sorbet and ice cream toppings
- Fruit preparations for dairy

Black carrot: the benefits

- Excellent stability
- Wide range of applications
- GMO-free
- Certified kosher and allergen-free
- Possible carmine (E120) replacement

Main applications

- Dairy
- Fruit preparations
- Yogurt
- Beverages
- Confectionery



Don't get floored by flooring

When it comes to what's hot in hygienic flooring, who better to ask than the experts? Here, they answer our top questions...

What would you say is the greatest breakthrough in hygienic flooring?

Kevin Cook, from Altro: 'Bonded seamless flooring has certainly advanced the cause of hygienic floors. It can be resin-based flooring or sheet vinyl, depending on the anticipated traffic and the substrate to which it is to be bonded.'

Martin Wroe, commercial director at RSL: 'Seamless resin flooring. The ability to reduce the number of areas in which bacteria can grow will reduce risk and improve hygiene standards.'

What are the most important considerations when choosing flooring for a food processing plant?

Kevin Cook, from Altro: 'Hygiene must be a major consideration, but durability

is also important in order to avoid the downtime necessary for replacement. The flooring material must also be able to withstand both thermal and chemical attack from food processing.'

John Lord & Son: 'Depending on the daily operations in the proposed area in the food processing plant, a balance of cleanability, an anti-slip profile and durability should be the most important factors when choosing the flooring.'

What is your most popular flooring choice for food manufacturers?

Kevin Cook, from Altro: 'A 6-9mm polyurethane resin floor, Altrocrete Pu Excel.'

John Lord & Son: 'For food manufacturers, John Lord would manufacture and install flooring from the Uragard HT range. The properties of the range provide the optimum

all-round performance necessary for the food manufacturing industry.'

Martin Wroe, commercial director at RSL: 'Resuthane TG69. It's a polyurethane floor screed which offers a highly durable system with excellent impact and abrasion resistance, good anti-slip properties in both wet and dry conditions. Resuthane TG69 also offers at least a 10-year life expectancy. The range ensures a safe working environment and can be utilised in many different areas.'

How do flooring needs differ among various industry sectors – eg meat, confectionery & bakery?

Kevin Cook, from Altro: 'Altrocrete Pu Excel is equally at home in each of these sectors, because it was developed to satisfy individual needs. However, in meat processing there is a need to withstand sharp

knives if dropped, and possible abrasion as heavy packed products are moved. There is a need, too, for hygiene with slip-resistance.

‘Confectionery may need less-aggressive slip-resistance but hygiene is ever-present, and hot sugars will erode concrete floors. Significant thermal tolerance is a requirement of any flooring materials.

‘In the bakery environment we may also need moderate slip-resistance, but thermal shock may result from bakery-trolley wheels, and the ubiquitous need for hygiene remains.

‘And let us not forget the dairy industry, where lactic acid will erode concrete, and the chemical resistance demanded by other sectors of the food industry, where resistance is required to other organic acids.’

John Lord & Son: ‘It is vital that the chosen flooring is appropriate for the industry environment where it will be installed. The main focus of the flooring choice will be the anti-slip profile.

‘In environments where meats, fats and greases are present, the logical choice from the John Lord range is our most aggressive grade of flooring – the Uragard HTAS. In environments where daily operations are mostly dry with occasional wet areas, the Uragard HT62W and HT120W flooring is the appropriate choice, providing the balance between cleanability and the anti-slip profile.

‘Choosing the flooring for different industries is essential in order to provide safe working conditions for the workers in that industry.’

What’s your biggest installation to date for the food/drink industry?

Kevin Cook, from Altro: ‘Larger installations often tend to be in multiple thousands of square metres. We have installations in the region of 5,000sq m and similar follow-up areas within the same premises.’

John Lord & Son: ‘We have manufactured and installed various grades of Uragard HT, Monocast, and IF for Arla Foods in Aylesbury, UK. Installing 35,000m² in total, the 115-acre site will become the world’s largest zero-carbon dairy, which will process and package up to one billion litres of fresh milk from British farms every year.’

How important is the flooring finish?

Kevin Cook, from Altro: ‘Uniformity affects ease of cleaning, which is paramount for hygiene, and so the quality of installations has improved across the industry.

‘Some polyurethane finishes installed 20 years ago would not be tolerated in the modern food plant. Slip-resistance is also

of vital importance to protect operatives in areas where hot or wet processes or cutting equipment are involved, but other areas of the food industry may involve deposits of fats and/or the manual movement of finished food product.’

John Lord & Son: ‘Although there is no return value on the floor for a manufacturing facility, providing the most suitable floor finish is crucial in different industries to maintain the highest hygiene levels required.

‘In addition, the anti-slip profile of the floor is equally important to provide the safest environment underfoot.’

Martin Wroe, commercial director at RSL: ‘Often floor finishes are overlooked and can be an afterthought. The finish is one of the most crucial elements to a project, as an incorrect or unsuitable specification can ultimately lead to problems, as the finish may not perform as expected.

‘We try to establish what is important for the project and specify systems accordingly.

The unique thing about a resin system is we can put forward bespoke systems to fit the client’s requirements.’

What’s the best way to combat dirt and bacteria?

Kevin Cook, from Altro: ‘Clean working processes to minimise spillage and effective housekeeping are both very important. The flooring supplier has a leading role to play, too, with the correct floor finish, which should be hygienic and easy to clean. However, anti-microbial agents within the floor are no substitute for housekeeping.’

John Lord & Son: ‘The first step in any industry to combat dirt and bacteria is to install an easily cleaned floor to help deter the problem, if not installed already. Post-installation, the most obvious way is to maintain a high quality and punctual cleaning regime using a combination of hot lances and detergent.’ ■



‘Flooring material must be able to withstand both thermal and chemical attack from food processing’



New units get Wilkin & Sons out of a jam

Wilkin & Sons, a UK-based maker of jams and marmalades, has been producing the condiments at its factory in Essex since 1885. And last year it manufactured more than 65 million mini-jars of preserves for hotels and restaurants alone.

The company's overall production now tops 7,000 tonnes annually but to cope with growing demand, a new cold store was needed.

On the advice of installers Adcock Refrigeration and Air Conditioning, and wholesalers AFR Refrigeration, four J&E Hall Fusion Scroll Condensing Units were chosen for the new 200m² cold store.

"Fruit for the production lines is kept in the cold store and the temperature has to be just right for our jams and marmalades," says Wilkin & Sons' electrician Mike Fitzgerald. "It is there for no more than 12 hours and should be stored in conditions varying between 0°C to 5°C, but we like to have the room temperature at between 2°C and 3°C.



Installation gets warm reception at UK site

"The old system had been running on a refrigerant no longer available. We did look at getting a drop-in replacement gas, but were advised that because of the age of the system it would not be worth doing. That's why a new installation made a lot of sense."

Adcock asked London-based AFR Refrigeration – distributors of the Fusion Scroll Condensing Units – to handle the design for the new cold store system.

"We knew that matching the Fusion Scroll units with Guntner evaporators would be a perfect combination," says AFR refrigeration marketing manager John Purbrick. "The JEHS-0800-M3 units are Enhanced Capital Allowance Scheme-approved and extremely efficient.

"They are supplied in a plug and play configuration, making them easy to install. Maintenance is straightforward and the price is competitive, so they have a lot going for them."

The Government's Enhanced Capital Allowance Scheme allows the customer to claim ECA on the cost of the qualifying equipment, transportation of the equipment to site and for direct installation costs in the first year – instead of ten years. Wilkin & Sons is currently in the process of claiming this tax relief.

It goes without saying that energy efficiency is key, and was a crucial consideration for the installation.

"We recommended four evaporators, four condensing units and two control panels," says Purbrick. "Each control panel operates two evaporators and has a digital step controller operating the condensing units individually – matching the cold room's load. This means the units do not have to run flat-out all the time, and this keeps the



'It's making a big difference in the production of jams and marmalades'

running costs down. At night time when demand is low, it allows you to have the cold room ticking over on two systems."

"The design for the new cold store was ideal," adds Keith Augustus, manager of the Ipswich branch of Adcock. "The Fusion units were easy to install and with the evaporators, everything came together perfectly. The icing on the cake for the customer is that not only do they have a new cold store, but the running costs are a lot lower than they would have been in the past."

The last word, however, must go to Wilkin & Sons' Mike Fitzgerald, who says the new cold store has already made an impact.

"It is making a big difference in the production of jams and marmalades – especially during the summer months," he says. "We now have a dedicated cold store for the fruit destined for the production lines – and everything is working well." ■

Learning to build a sustainable future

Sustainability is something with which food and drink retailers have grappled for years, and yet a term which the consumer uses with increasing confidence.

With the government target in place to reduce greenhouse gas (GHG) emissions in the built environment by 80 per cent by 2050, it is also an issue that is moving further up the supply chain. And the buildings in which food is manufactured, processed and packaged are no exception.

Spiralling costs

Spending approximately £800 million (€947m) on energy every year, the food and drink industry is one of the major energy users in the UK. It is a cost that has spiralled rapidly in recent years.

Not long ago, the main expense for any business would have been staff wages – now it is energy. Saving money by using less energy is an obvious solution but one that many have found hard to implement.

In fact, more than £120 million (€140m) is currently being thrown away every year in operating costs. Yet cost remains the reason cited most often by businesses who decide not to pursue more sustainable specifications when developing new or refurbishing existing premises.

In effect, short-term planning, justified by lower immediate construction costs, continues to be favoured over more strategic investment in sustainability. The more strategic approach, however, could provide far greater financial savings, along with an increase in brand value and other



Mark Reeve

When developing or refurbishing premises, a collaborative, strategic approach is vital. Mark Reeve, MD of Chalcroft Construction, explains

marketable corporate social responsibility (CSR) achievements long term.

Today's reality, however, is that less energy efficient buildings continue to be built, incurring far greater costs in the long term. Meanwhile, the industry continues to place increasing demand on finite natural resources, which simply serves to drive energy prices higher still.

It is an unsustainable cycle and one that the industry cannot afford to ignore until legislation or spiralling prices force sustainable measures to be adopted as standard.

Fresh approach

For the food industry, sustainability and best practice in construction means investment in buildings to ensure they are durable, cost effective and affordable to operate, as well as energy efficient. It also means that once food manufacturing buildings are operational, they can play an active role in climate change mitigation, as well as conserving natural resources.

A sustainable building will deliver further savings through improved occupant comfort and increased levels of productivity. The reduction in energy use and use of other sustainable solutions, such as micro-generation, will also bring wider, long-term benefits, contributing to the security of energy supplies.

A building constructed with these principles in mind can add significant value to a brand by providing a demonstrable commitment to CSR. Yet the challenging economic conditions of late, and caution in investment, mean that while sustainability may have been accepted as a concept for construction, its implementation in the food industry has been inconsistent.

Ultimately, to maximise cost savings, help secure future energy supplies and conserve resources, a fresh approach is required.

Best practice

There are many ways in which the food industry can ensure it operates as sustainably and cost effectively as possible.

From the use of sustainably sourced timber instead of concrete, to the micro-generation of energy, the installation of energy efficient fixtures and fittings, and other measures designed to conserve natural resources such as rain water harvesting, the construction industry has a wealth of knowledge and experience.

Internal research undertaken by Chalcroft tells us that while there is continuing interest in these sorts of sustainability, a significant proportion of green specifications are dropped, as budgets come under close scrutiny during the planning process.

For some, the return on investment simply isn't considered to be quick enough while, in many situations, it is simply too late to incorporate more sustainable options by the time construction companies are consulted.

It is vital that the food industry engages at the earliest opportunity with construction companies whose experience and expert knowledge can complement that of architects and designers, to achieve best practice.

In addition, all parties must be prepared to work collaboratively and accept alternative recommendations to provide a more sustainable solution where appropriate.

Only by working cohesively, in partnership with the construction sector, will the food industry be able to achieve the multi-million pound savings and improved environmental performance that underpins all economic growth today. ■



Ulma ahead of the pack

Ulma Packaging has unveiled a new horizontal flow-wrapper designed specifically for the fresh produce, bakery, confectionery and snack markets.

The FR 305 incorporates a rotary jaw, console and ergonomically designed cantilever to reduce debris accumulation, making cleaning and sanitising far easier, says Ulma.

“This latest model has been built around a state of the art PC processor which stores up to 99 different packaging profiles, enabling a high level of flexibility for different product changeovers,” explains a spokesman for the firm. “Key features include two independent motors which are synchronised electronically, easy service access and left to right operating direction.

“When operational the machine produces a three sealing pillow pack, making it ideal for durable and non-durable items. This includes packs for bread, cakes and most fruits and vegetables.”

Control of the FR 305 is managed via an operator console which enables the bag length, pusher position and height adjustment to be managed from a touchscreen.

Scoop for UK ice cream firm

Ice cream producer Cheshire Farm has installed a new metal detector and conveyor system at its UK site.

Producing more than 2,000 litres of ice cream per hour, in more than 30 different flavours and a range of tub sizes, the ice cream firm chose an end-of-line system from Lock Inspection Systems to replace its outdated metal detector.

“Accurate inspection of ice cream can be difficult because the conductive signal varies according to the temperature of the product,” explains Rob Gray, UK sales at Lock Inspection Systems. “With



temperatures of around -6°C at inspection, any unexpected rise or fall in ambient temperature may change the temperature of the ice cream and alter the conductive signal that it generates.

“Our technology can track such fluctuations and make the necessary adjustments to ensure a high level of contaminant sensitivity.”

Bühler in frozen pepper feat



Ukraine-based Frozen Group Company says it has dramatically reduced the defect levels for frozen peppers, following the installation of a Bühler Sortex E1D.

“We’ve been able to reduce incoming defect levels from an initial 75 per cent to an exceedingly low company specification, while saving the small seeds for maximum value,” says a spokesman for the firm.

“The loss of good product in the reject is now significantly less than one per cent.”

The Frozen Group Company has

produced frozen fruits, vegetables and berries for more than 15 years. However, its range of sliced, cut and diced frozen red, green and yellow peppers contained as much as 75 per cent core and stalk, left over from its automated cutting system.

“That’s why we recommended the installation of an E1D, fitted with an ice kit, to enable operation in low temperatures below 0°C.

“Reverse mode allows the E1D to ‘reject’ the good peppers, permitting unwanted material, including stalk, core and stem, to pass through,” explains Zhanna Zhehet, sales manager at Bühler Kiev. “This lowers ejector wear and tear with reduced firing rates, while dramatically raising overall product recovery.”

Sugar cane cap launch from Tetra Pak

Tetra Pak has launched LightCap 30 – a high-density polyethylene (HDPE) cap made from sugar cane.

Tine, a dairy producer, distributor and exporter based in Norway, is the first brand in Europe to use the bio-based caps. Its Piano vanilla sauce, Tine iced coffee, iced tea and chocolate milk will be packaged in the Tetra Brik Aseptic Edge with the bio-based cap.

“As one of Norway’s largest users of packaging, it is important that we use our resources optimally and prioritise sustainability,” says Björn Malm, sustainability manager at Tine. “This is a

business imperative for us. The bio-based cap, offers us the opportunity to further enhance the environmental profile of our products.”

The renewable polyethylene used in LightCap 30



starts out as sugar cane. The cane is then crushed, and the juice fermented and distilled to produce ethanol.

Through a process of dehydration, ethanol is converted into ethylene, which is then polymerised to produce the polyethylene used to manufacture the cap.

“The development of the bio-based LightCap 30 is another step towards our goal of producing a 100 per cent renewable packaging solution,” adds Erik Steijger, product manager, Tetra Pak.

Well-oiled achievements

UK food-grade lubricants manufacturer Rocol has introduced caps and actuators on aerosol spray cans in its Foodlube range that, it says, will reduce the risk of foreign object contamination during food and drink processing.

The firm says it's the first in the UK to add Detex metal detectable plastic actuators and caps to aerosol cans.

"This means caps and actuators on Foodlube packs can be identified using standard metal detection equipment, should they become loose in food and drink manufacturing areas," says marketing manager Joanne Ferguson. "The addition of Detex caps and actuators represents



another important step in helping food and drink processors avoid downtime, product recalls and the risk of reputational damage."

Meanwhile, ExxonMobil has expanded its range of NSF H1-registered lubricants produced in ISO 22000 certified facilities.

Established by the International Organisation of Standardisation, ISO 22000 is one of the most recognised and comprehensive food and beverage safety standards.

It includes a set of requirements designed to ensure a company's ability to control food safety at every step of the manufacturing process.

Recently, facilities producing ExxonMobil's family of

Mobil DTE FM Series high-performance hydraulic gear and bearing lubricants, Mobil SHC Polyrex Series synthetic greases, and Mobil-grease FM Series multi-purpose greases received ISO 22000 certification.

And last year, facilities manufacturing the company's Mobil SHC Cibus Series family of hydraulic, gear and air compressor lubricants also received ISO 22000 certification.

"We are thrilled to be the only lubricant maker to have NSF H1-registered lubricants produced in ISO 22000 certified facilities," says Yan Côté, global business development adviser at ExxonMobil Fuels & Lubricants. "This certification clearly demonstrates our ongoing commitment to supporting and assisting our customers' food safety assurance objectives."

Result for Riggs



Filling machine firm Riggs Autopack has secured an order from Harj Dhillon, an artisan manufacturer of Indian cooking sauces.

Dhillon, who previously used jugs to fill plastic pouches and jars, knew that in order to keep up with demand he would have to move to semi-automatic depositing.

Following a successful trial, he ordered a filling machine with pouch-forming unit to open the pouches using clean, filtered air prior to filling.

"It's fulfilling all manufacturing demands," says Dhillon.

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Get validated and verified

Countless stories of food contamination have hit the headlines in recent years – from outbreaks of listeria in cantaloupes in the US in 2011, to the identification of undeclared horsemeat in processed beef products in the UK and Europe this year.

The Food & Drug Administration (FDA) reports that 48 million Americans become sick each year due to foodborne illnesses, while around 90,000 cases of food poisoning are recorded annually in England and Wales.

Clearly, such incidents not only erode consumer trust and satisfaction, but have the potential to cause irreparable damage to a brand's reputation. That's why it's vital that manufacturers give due consideration to the issue of traceability.

With increased regulation, such as the FDA's Food Safety Modernisation Act (FSMA), as well as growing consumer demand for greater transparency from the products they purchase, there has never been a better time for food manufacturers to review their processes.

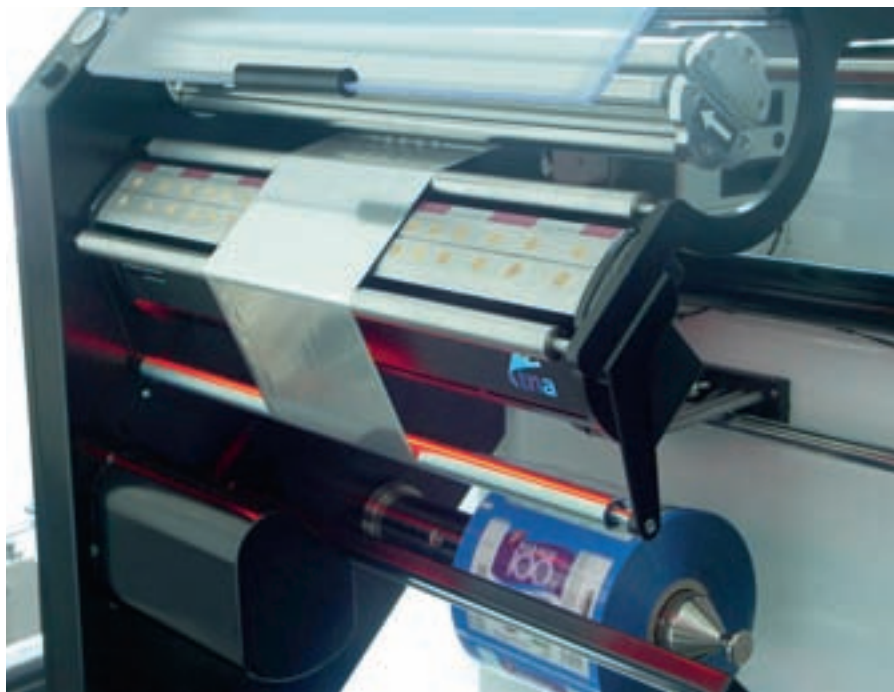
According to a report from Global Industry Analysts (GIA), the global market for food safety testing is projected to reach £16 billion (€19.7bn) by 2018, and the APAC region represents the fastest growing opportunity for food safety testing due to lack of regulation, or the lack of its implementation.

Defining traceability

Traceability is a risk management tool and refers to the way in which manufacturers record the movement of products throughout the processing stages, usually through barcodes or RFID tags.

It gives manufacturers a practical way of responding to potential issues that can occur in food processing, and is particularly useful in cases where products need to be recalled because of contamination. By employing efficient traceability methods, it is possible to identify the precise date or time, and the exact location of any goods that must be recalled.

In this way, risks can be identified and traced back to the source to isolate the problem, and prevent contaminated



Improving the traceability of products is essential for manufacturers to operate safely in a highly regulated industry. Shayne de la Force, group marketing manager at tna, explains

products entering the value chain and reaching consumers. It can also save significant amounts of time should product recalls be needed, prevent costly wastage by differentiating between products that are still safe and those that are not, and ultimately help preserve the brand's reputation.

Improving traceability throughout the entire production chain allows operators to regain control over product quality and food safety.

Rising regulation

In order to address food safety scandals, governments across the globe have recognised the need for greater regulation. For example, in the US, the FDA introduced the FSMA in 2011, which spans from the source to the processing and packaging stage.

This new act builds on existing Hazard Analysis Critical Control Point (HACCP)

rules, which have been the defining standard for food safety management since the 1960s. It puts the onus on food manufacturers to prevent food contamination, rather than just responding to cases once they have occurred.

The FSMA is designed to establish a risk-based and global systems approach to food safety, to provide greater safeguards to the industry and consumers.

As well as putting in place controls to prevent food contamination, manufacturers are now required by the FSMA to submit safety plans to the FDA to demonstrate how they will tackle an issue, and there will be more spot checks from government officials to ensure these processes are properly implemented.

It also includes stricter operating standards and enforcement of accurate labelling. And it's not just American manufacturers who are affected; it applies to food from

overseas too. Up to 15 per cent of the entire US supply chain is imported, meaning that manufacturers around the world who supply the US will also have to adhere to the regulations.

There is already evidence to suggest that the new FSMA rules have had a positive impact on consumer safety.

Class 1 recalls, listed as those 'having a reasonable probability that the use of or exposure to a violative product will cause serious adverse health consequences or death', have led to a reduction in cases of salmonella from 43 per cent in 2010 to 21 per cent in 2011.

In the EU, implementing traceability systems has been compulsory since 2002 when the General Food Law came into force.

General requirements detail the need to keep records to monitor product and ingredient movement, and cover all food and feed, all food and feed business operators, as well as including sector-specific legislation for certain applications, such as meat products.

As with US regulation, importers are similarly affected, as they will be required to identify from whom and where the product was exported. It is clear that most local, and many global, manufacturers must implement some form of traceability system in order to comply with regulation, and continue to operate safely on an international scale.

Manufacturers can make use of resources like the Food Safety Alliance for Packaging (FSAP), a technical group of the Institute of Packaging Professionals that offers food safety forms, models and HACCP planning resources, as well as using specialist suppliers with the expertise to navigate the industry.

Actualising automation

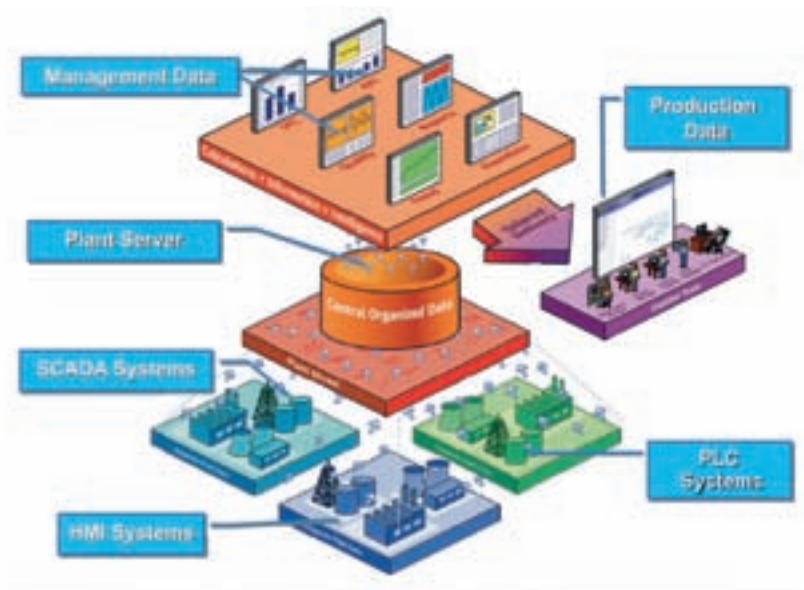
Automation is a key component when improving traceability. Product quality issues can apply to both raw materials and finished products, and are often caused by badly specified, outdated or poorly configured control systems.

By implementing systems that can be easily validated and incorporated into existing processing and packaging lines, it is possible to obtain essential monitoring data that will satisfy traceability requirements.

It is important that detailed and reliable data from as many parts of the production process as possible are collected and thoroughly evaluated.

Barcode scanning and in-line monitoring systems ensure products are always within specification and adhere to all food safety regulations, with accurate labelling to correctly identify what is within the packaging.

Using an effective tracking system to monitor any goods that arrive, control



existing stock and keep up to date on products' shelf life, will help reduce raw material wastage, make inventories more accurate and maintain quality at all times.

In addition, with production tracking software, food processors can monitor and record information about their processes, enabling them to rectify any issues and have the documentation available to meet new record keeping requirements.

Keep it clean

Detecting foreign bodies within the production line is of primary importance. Metal detection technology allows processors to identify potential risks in products, and inspections must monitor for small pieces of metal to ensure consumer safety.

The equipment must therefore be sensitive and reliable so that nothing is missed that could harm consumers. Equally it must reduce the risk of false detections that can often lead to wasted products and time.



It is also essential to identify the correct points in the process to monitor the products, as the earlier a contaminant can be discovered and removed, the fewer products will be spoiled, making greater savings possible. Such equipment must also operate at high speeds to ensure that productivity is not adversely affected.

Plant hygiene is also paramount in the battle to eradicate foreign bodies and avoid environmental contamination concerns.

An effective and well-documented cleaning process is necessary to meet the new FSMA requirements and assure complete food safety, with equipment cleaned on a regular basis.

Easy-clean materials such as stainless steel, as well as reducing the number of moving parts where products can become trapped, facilitates this process, eliminating the need for lengthy downtime and reducing the risk of allergens or contamination.

Summary

Food safety should be a primary concern for all processors, from both a consumer health and industry perspective. Manufacturers should review their processes and packaging lines to ensure they are fully validated and verified.

Packaging solutions firm tna uses its expertise in traceability solutions to help manufacturers protect consumer safety, as well as their own reputation.

Improving the traceability of products is essential if they are to continue to operate safely, and remain competitive in the highly regulated industry. Partnering with a specialist can help to facilitate this process, and maintain the high quality standards that are necessary to safeguard consumer safety and brand loyalty. ■

A taste for waste

In the last of the series, Richard Marshall FIFST, of Bath Spa University, and Tom Hollands MIFST, of Raynor Foods, describe a project to help measure and reduce waste at a UK sandwich company



It is estimated that in England alone the food industry wastes more than three million tonnes of food annually.

Some very large food companies have been making a major effort to reduce their carbon footprint and reduce their waste, which improves overall productivity and mitigates their impact on the environment.

While segregation of wastes at source makes disposal easier, it is more cost-effective to reduce the amount produced, recycle or reuse it.

With London Metropolitan University MSc student Rakesh Yadav, we studied how waste was generated at a sandwich manufacturer and helped to explore ways of minimising it, as well as improving recycling and reuse. The carbon footprint of examples of the sandwiches produced by the company was also measured.

Raynor Foods is a second generation family business based in Chelmsford, Essex. The company is committed to sustainable practices with a supporting culture of continuous improvement, so the likelihood of seeing the project through to completion and acting on any suggestions was highly probable.

We used a checklist to record the type and quantity of waste generated in the production area, offices, changing rooms and toilets.

Production was followed for 14 days and we recorded the source of waste generated, percentage share of each waste stream, potential ways of

minimising the waste and recycling options.

Measuring the waste also helped educate staff, and make them aware of how much they produced and how they could reduce it.

The carbon footprint of chicken and bacon sandwiches was measured, along with the information available from the Hazard Analysis Critical Control Points (HACCP) manual, ingredient specifications and supplier interviews. CO₂-equivalents (CO₂-e) and distances travelled by ingredients from suppliers were calculated, and data for energy and water use was obtained.

Over the two weeks, the average amount of bread waste was about 100kg per day, or 34 tonnes per year. Bread waste was the major contributor (36 per cent) but there was limited scope at that time to minimise it.

It was estimated that only two to three per cent could be saved as it was formed mostly of crusts cut off during production.

Armed with this observation, Raynor Foods entered into a significant project with a local pig farmer.

The next major waste stream consisted mainly of vegetable matter, such as tomato and cucumber. Plastic waste consisted mostly of the buckets in which the mayonnaise and margarine were supplied, and damaged plastic packages.

Paper waste came from a variety of sources, including sandwich packaging and miscellaneous paper. And metal waste came mostly from the containers for raw materials. Yet we found that there were a number of opportunities to minimise or recycle the waste.

It was estimated that the firm could reduce the amount of waste produced annually from 100 tonnes to 40 tonnes.

Bread and organic waste can be used for animal feed or for composting or anaerobic digestion (AD). Composting would give a significant financial saving per year. If the company introduced AD, it would not only reduce the amount of waste leaving the site, but also generate methane that could be used as fuel within the premises. However, there would be installation costs associated with this.

Raynor Foods is now planning to send such waste to a local anaerobic digester currently being built by the local council.

Carbon footprinting has been gaining

increasing importance in characterising the efficiency of industry but reporting is not mandatory.

It is not obvious to a business how carbon footprinting can affect financial profitability, although efficiency savings may be identified through the analysis. In this study, the ingredient producers generated the major greenhouse gas emissions for the sandwiches that were studied. At present, it is not possible for the sandwich company to change this, though they could consider encouraging suppliers to adopt best practice as defined by the IFST (*Manning, 2006*).

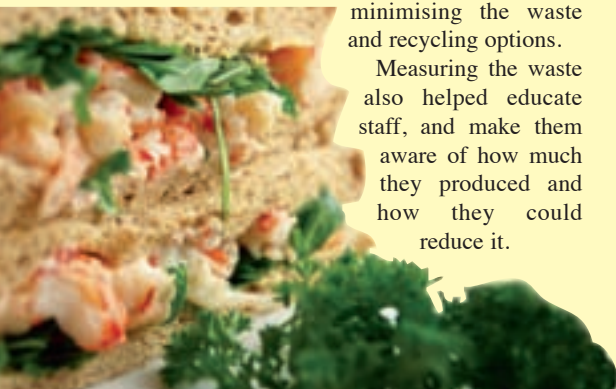
The sandwich maker Greencore and Allied Bakeries have both published carbon footprints (*Greencore, 2010; Allied Bakeries, 2010*). Such large companies can afford this but small food SMEs generally cannot, even though they probably have the most to gain. The Carbon Trust helps some of these firms by measuring and certifying their environmental footprint.

From this project, significant waste reduction opportunities were identified that could lead to major savings. Other companies could make similar savings. Large food firms are leading in this but many European SMEs have insufficient resources to improve efficiency.

Examination of waste at this sandwich producer identified the main sources of CO₂-e emissions but these were largely beyond the control of the company itself due to the nature of the product supplied.

Feedback from the company indicates that they found the project to be both interesting and rewarding. Through the close partnership with the university, they created various waste monitoring systems that are still ongoing.

In addition, the project also helped create awareness at all levels of the company on key sustainability issues, as well as being a useful training mechanism. The benefits of the project are multi-faceted – it helped the company identify and measure its waste streams, as well as helping it achieve ISO 14001 this month. ■



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Charnwood range by Measom Freer

Measom Freer has added the svelte Charnwood bottle range to its products. These slim bottles with tapered shoulders, and manufactured in clear PETG. The collection is available in 100ml (Ref 6184) with 18mm R4 415 neck & 300ml (Ref 6167) with 24mm R4 415 neck size. Also added to existing ranges are the new 15ml size oval PVC Griffin bottle with 15mm R4 415 neck (Ref 6500) and 25ml round PVC Europa bottle also with 15mm R4 415 neck (Ref 6370). And why not add a spray pump in new 15mm R4 415 (Ref 49315)? Also stocked are gel pumps (neck sizes 20-24mm) and lotion pumps (neck sizes 24-31mm).

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Linx Printing Technologies is introducing a ketone-free ink to meet increasing demands for an ink that does not contain MEK and acetone. The Linx Black Ink 340I offers a drying time of one to three seconds on both porous and non-porous materials, as well as superior light fastness and excellent adhesion and contrast on a range of materials, including paper, plastic and flow-wrap. The ink has good general chemical resistance, which makes it resilient to chemical splash from alkalis, acids, water, alcohol, petrol and cutting fluid, and is capable of heat resistance of up to 30 minutes at 300°C with no adhesion or colour change.

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Systems Labelling launches Ecoplas

Systems Labelling's latest product development – the 'Ecoplas' label – offers a real alternative to paper labels when used on plastic bottles. Recycling trials have proven synthetic labels peel away during the recycling process resulting in over 90% label removal. The waste labels are then recycled into polyolefin compounds, whereas adhesive paper labels break down and create a pulp which causes colour contamination and has to be collected and sent to landfill. Environmental benefits apart, Systems Labelling also says it can offer the Ecoplas label at no on-cost when compared to paper. mark.duncan@systemslabelling.com

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Get more from floors with Flowcrete

Flowcrete UK puts the importance of service under the spotlight in the final instalment from its 'Get More From Floors' campaign. The industrial flooring specialist – which has more than 30 years' experience in the sector – highlights how its complete package of support can provide peace of mind for installation projects. Full details of 'Get More From Floors, Get More Service', are available at www.flowcrete.co.uk/campaigns/get-more-from-floors/get-more-service

The subject is the sixth and final topic explored in Flowcrete's long running campaign, and follows on from the subjects of durability, hygiene, safety, speed and resistance. More details can be found at www.flowcrete.co.uk/campaigns/get-more-from-floors/ 'Get More From Floors' online resource centre shares Flowcrete UK's wide-ranging expertise and experience to help those tasked with selecting floor finishes make informed decisions.

Last year, Flowcrete UK took service delivery to a new level with the launch of Isocrete Project Management, which offers the complete solution underfoot for the industrial sector – drawing on



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Vikan's new range of brushes

Vikan, leader in advanced hygienic cleaning solutions, introduces its improved range of cleaning brushes designed for efficiency and functionality in food production.

Users will notice quite a few differences with the new brush concept which combines hygiene and efficiency with good looks. The smooth, dynamic profile and multifunctional grip points aid handling and application by offering a more comfortable and efficient grip. Meanwhile, the non-symmetrical head includes shorter and stiffer filaments to deliver a scrubbing action and longer angled filaments to reach into corners.

Key features with regard to the improvements in hygiene offered by the brush range are the externally angled and faceted design, minimising flat surfaces where liquids can lie as well as dirt traps. The redesigned hanging hole provides better access for cleaning and encourages the tool to be placed on a hook for storage.

"The innovative design is an excellent example of how the collaborative dialogue we maintain with our customers delivers real benefits in the form of new products that directly solve their cleaning challenges," says Global R&D manager and hygiene



specialist Debra Smith. "These brushes are designed to deliver the optimal efficiency and hygienic cleaning our customers expect from Vikan, but also look appealing and feel good in the hand."

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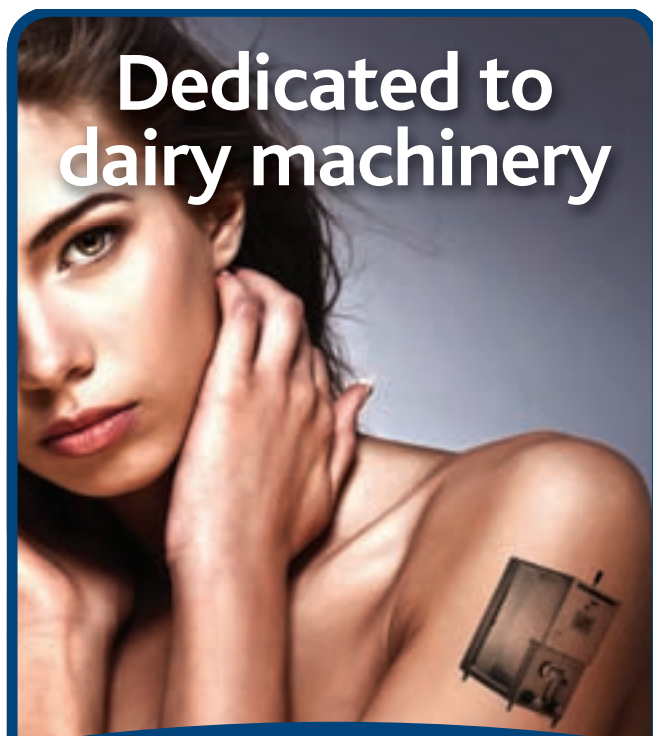


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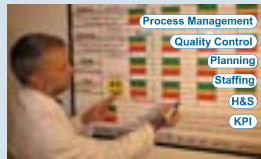
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JUNE 2013



International Scientific Conference on Probiotics and Prebiotics

Date: 11-13 June
 Location: Kosice, Slovakia
 Email: info@probiotic-conference.net

Nutrition for industry: knowledge and current trends behind branding, marketing and innovation

Date: 20 June
 Location: Leatherhead Food Research, Leatherhead, Surrey, UK
 Website: www.leatherheadfood.com/nutrition-for-industry

Powder mixing technology

Date: 20-21 June
 Location: Amsterdam, the Netherlands
 Website: www.cfpa.com/upcomingCourses.aspx

13th international conference on antioxidants

Date: 26-28 June
 Location: Marrakech, Morocco
 Website: www.isanh-me.com

Labelling for marketers

Date: 28 June
 Location: Leatherhead food Research, Leatherhead, Surrey, UK
 Website: www.leatherheadfood.com/labelling-for-marketers

JULY 2013

UK AD & Biogas 2013

Date: 3-4 July
 Location: NEC, Birmingham, UK
 Website: www.adbiogas.co.uk/uk-ad-biogas-2013/

SEPTEMBER 2013

Legal labels in depth: a comprehensive guide to UK food labelling

Date: 11-12 September
 Location: Leatherhead Food Research, Leatherhead, Surrey, UK
 Website: www.leatherheadfood.com/legal-labels-uk

Vietfood & Beverage/ProPack Vietnam 2013

Date: 11-14 September
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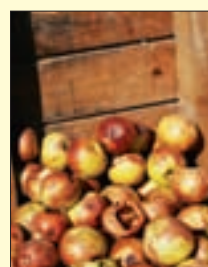
Date: 18-19 September
 Location: Peterborough Arena, UK
 Website: www.tcsanddshow.com/register.php

Foodex China

Date: 26-28 September
 Location: Hangzhou Peace International Exhibition Center, Shaoxing Road, Hangzhou Zhejiang, China
 Website: www.foodexchina.com



OCTOBER 2013



Biogas: generate energy from your waste

Date: 17 October
 Location: Campden BRI, Chipping Campden, UK
 Website: www.campdenbri.co.uk/biogas-seminar.php

7th International Conference on Diabetes & Obesity

Date: 24-25 October
 Location: Riga, Latvia
 Website: <http://www.isanh-lv.com/alerts-on-obesity/welcome-to-riga-obesity-a-diabetes-2013>

NOVEMBER 2013

Food defence and crisis management: developing a food defence plan

Date: 12-13 November
 Location: Leatherhead Food Research, Leatherhead, Surrey, UK
 Website: www.leatherheadfood.com/food-defence

Fi Europe & Ni

Date: 19-21 November
 Location: Messe Frankfurt, Germany
 Website: www.fiurope.ingredientsnetwork.com





'I'm a big believer in creating your own destiny'

Fresh from the success of last month's show, Vitafoods Europe director Chris Lee talks travel, tango and changing lives...

Describe yourself in three words

Leader, structured, strategic.

What's your biggest professional achievement?

Building a successful division, from scratch, within a big corporate company. It has been a long journey to take Vitafoods from a small exhibition in 2004 to the market leader for its industry, with a presence in three continents.

How did you get to where you are today?

I started in sales for a small exhibition organiser working on numerous shows. That meant I had fantastic opportunities to get involved in everything, which helped fast-track my career. After five years there, I left to join Informa and took on Vitafoods, having recognised the huge potential of what could be achieved within a 10-year vision. I'm eight years down the line now and feel honoured to have built the brand into what it is today.

What is your pet hate?

Time-wasters, bad science and uneducated consumers who do not understand that they can prevent disease and maintain their health through nutrition.

Give us a positive prediction for the food industry over the next 12 months

Large manufacturers are spending money on marketing campaigns to educate consumers about the benefits of their products. With an ageing population, more disposable income and a greater interest in health and wellbeing, consumers will naturally turn to dietary supplements and functional foods and drinks. With Article 13 health claims now enforced, we should

see clear messaging on claims hitting supermarket shelves.

What do you consider to be the most important attributes for a leader?

Leading by example and giving a clear vision to your team, project or industry. Enthusiasm, determination and mentoring are key, but the ability to listen, understand and implement will set exceptional leaders apart from others.

Who do you most admire?

I admire those who make a difference, innovate, inspire, are top of their field, determined and believe in their own vision, passion and cause – from Ayrton Senna to Bill Gates.

Which people/organisations or companies are the ones to watch right now?

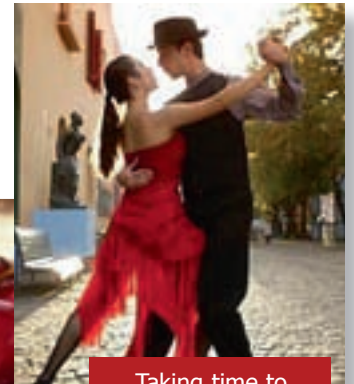
The nutraceutical industry has seen more acquisitions over the last two years than ever before. DSM and BASF are both ones to watch, each having spent a huge amount of money on established players and smaller, niche companies. Nestlé should stay on the radar with its ambitions for research and innovation, and move towards acquisitions. In terms of key markets, infant and elderly health products are big news for this year.

Which words do you most overuse?

I think I may be guilty of saying 'have you thought about it like this' a little too much, or 'I have a new idea'.

If you weren't Vitafoods director, what else might you be doing?

Travelling the world and learning about culture, language and traditions, while writing a successful range of 'rough guide'



Taking time to tango: Chris has a passion for dance... and red grapes



books about the 190 or so countries around the globe.

Tell us something about yourself that few people know

I have a huge passion for all types of music and dance. I particularly like to tango, which I first started some years ago in Buenos Aires. I also have a secret passion for drumming.

Any vices?

Red grapes, including Pinotage, Malbec and Shiraz, are right up there, but karaoke is still a major release.

What single thing would most improve the quality of your life?

Nothing. I am a big believer in creating your own destiny and that you chose to make your own quality of life.

How do you relax?

They say that 'the time to relax is when you don't have time for it' and I hope I never find myself in this situation. I enjoy high octane sports and time with family. Having young children keeps you on your toes and really gives you that balance and understanding of how to split your time.

How would you like to be remembered?

For making a difference, however little or large, and changing people's lives for the better.

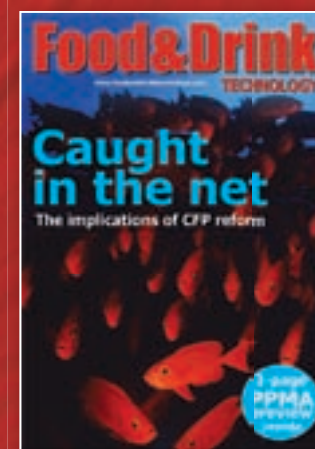
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