



HACCP INTERNATIONAL

FOOD SAFETY BULLETIN

ISSUE 14 2018

USA Meats

food safety and trade risks

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Welcome



Clive Withinshaw,
Director, HACCP International

As HACCP International approaches its twentieth birthday, we see a very different food industry to that in place at our beginnings. For now, I thought I might comment on just one of those changes.

A further 1.5 billion mouths to feed on the planet. To put that in perspective, a twenty year increase equal to five times the population of the USA or the equivalent of another Chinese population added to our numbers! Allowing for a small amount for wastage, that is roughly equal to 1.5 billion tonnes of food p.a!

The food resource challenge that those last twenty years brought goes largely

uncommented upon but it was perhaps the biggest challenge faced in that time. It is difficult to say it was successful when one million children die each year from malnutrition, but broadly speaking, it has been better than the world dared hope 20 years ago. While international charities and bodies, such as The UN's FAO, have had an influence on this, it has mainly come about through gradual and incremental change at local levels and an improvement in agricultural and process efficiency – motivated to a great extent by commercial pressures but with significantly larger consequences than a trade result.

Experts suggest a further population increase of 900 million in the next 20 years – a much decreased number but hardly 'a piece of cake'. Agricultural and food processing businesses have to continue developing at an increasing rate to satisfy The FAO's four pillars of food security. Volume alone doesn't provide solutions. While food security, in its broad definition, encompasses access to food and nutrition – another real challenge will be to maintain the safety and stability of that food supply; be that from bioterror, poor practices or logistical problems.

'Food security exists when all people at all times have physical, social and economic access to sufficient, safe and

nutritious food to meet their dietary needs and food preferences for an active and healthy life. The four pillars of food security are: food availability, access to food, utilisation and stability'.

The article on page 4 makes uncomfortable reading but for those in government and international food supply, it is a reality which needs to be at the forefront of thinking – sadly, its constancy seems to relegate its priority.

On a more mundane front, HACCP International's certification programme continues to see many of the world's best products that have incidental food contact or an impact on food

safety going through its evaluation process – proving their products to be particularly suitable for the food industry with investment in, and attention paid to food safe qualities. Products from the likes of Kadant (processing blades) and Industrial Magnetics (separation equipment) in The USA, Argelith

(flooring), AM Technology (coatings), Danfoss (temperature management), Essity (wipes) and Sika (flooring) in Europe, Kuraray Kuraflex (wipes and cloths) and Hoshizaki (refrigeration/ice) in Japan show a diversity of product and source coupled with global distribution of excellent products with food safety front and centre of their design and processes. We recommend them highly.

The 15th May sees us introducing the first HACCP International Food Safety Forum in Kent, UK. If you are in that part of the world, feel free to register at no charge (other than a voluntary donation to Water Aid), and my UK colleagues and I look forward to saying hello to those who can make it. It should be a really good, inter-active day.

Lastly, a very warm welcome to our new Vice-President in The USA, Mr Ron Vail. Ron is known to many in the American food industry already but for those who don't, see more on page 19. ❄

The 15th May sees us introducing the first HACCP International Food Safety Forum in Kent, UK."



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From The United Nation's FAO:

World's future food security "in jeopardy" due to multiple challenges, report warns. Without additional efforts, the target of ending hunger by 2030 will not be met.

Empowering small-scale farmers and providing them better access to information, markets and technologies is key to ensuring future food security.

The UN FAO released a report after last year's Rome meeting commenting upon mankind's future ability to feed itself being in jeopardy due to intensifying pressures on natural resources, mounting inequality, and the fallout from a changing climate, warns a new FAO report out today.

Though very real and significant progress in reducing global hunger has been achieved over the past 30 years, "expanding food production and economic growth have often come at a heavy cost to the natural environment," says *The Future of Food and Agriculture: Trends and Challenges*.

"Almost one half of the forests that once covered the Earth are now gone. Groundwater sources are being depleted rapidly. Biodiversity has been deeply eroded," it notes.

As a result, "planetary boundaries may well be surpassed, if current trends continue," cautions FAO Director-General José Graziano da Silva in his introduction to the report.

By 2050 humanity's ranks will likely have grown to nearly 10 billion people. In a scenario with moderate economic growth, this population increase will push up global demand for agricultural products by 50 percent over present levels projects *The Future of Food and Agriculture*, intensifying pressures on already-strained natural resources.

At the same time, greater numbers of people will be eating fewer cereals and larger amounts of meat, fruits, vegetables and processed food – a result of an ongoing global dietary transition that will further add to those pressures, driving more deforestation, land degradation, and greenhouse gas emissions.

Alongside these trends, the planet's changing climate will throw up additional hurdles. "Climate change will affect

every aspect of food production," the report says. These include greater variability of precipitation and increases in the frequency of droughts and floods.

To reach zero hunger, we need to step up our efforts

The core question raised by last year's FAO publication is whether, looking ahead, the world's agriculture and food systems are capable of sustainably meeting the needs of a burgeoning global population.

The short answer? Yes, the planet's food systems are capable of producing enough food to do so, and in a sustainable way, but unlocking that potential – and ensuring that all of humanity benefits – will require "major transformations."

Without a push to invest in and retool food systems, far too many people will still be hungry in 2030 – the year by which the new Sustainable Development Goals (SDG) agenda has targeted the eradication of chronic food insecurity and malnutrition, the report warns.

"Without additional efforts to promote pro-poor development, reduce inequalities and protect vulnerable people, more than 600 million people would still be undernourished in 2030," it says. In fact, the current rate of progress would not even be enough to eradicate hunger by 2050.

Where will our food come from?

Given the limited scope for expanding agriculture's use of more land and water resources, the production increases needed to meet rising food demand will have to come mainly from improvements in productivity and resource-use efficiency.

However there are worrying signs that yield growth is levelling off for major crops. Since the 1990s, average increases in the yields of maize, rice, and wheat at the global level generally run just over 1 percent per annum, the report notes.

To tackle these and the other challenges outlined in the report, “business-as-usual” is not an option, *The Future of Food and Agriculture* argues.

“Major transformations in agricultural systems, rural economies and natural resource management will be needed if we are to meet the multiple challenges before us and realize the full potential of food and agriculture to ensure a secure and healthy future for all people and the entire planet,” it says.

“High-input, resource-intensive farming systems, which have caused massive deforestation, water scarcities, soil depletion and high levels of greenhouse gas emissions, cannot deliver sustainable food and agricultural production,” adds the report.

More with less

The core challenge is to produce more with less, while preserving and enhancing the livelihoods of small-scale and family farmers, and ensuring access to food by the most vulnerable. For this, a twin-track approach is needed which combines investment in social protection, to immediately tackle undernourishment, and pro-poor investments in productive activities – especially agriculture and in rural economies – to sustainably increase income-earning opportunities of the poor.



Climate change will increase the frequency of droughts and damage yields

The world will need to shift to more sustainable food systems which make more efficient use of land, water and other inputs and sharply reduce their use of fossil fuels, leading to a drastic cut of agricultural green-house gas emissions, greater conservation of biodiversity, and a reduction of waste. This will necessitate more investment in agriculture and agrifood systems, as well as greater spending on research and development, the report says, to promote innovation, support sustainable production increases, and find better ways to cope with issues like water scarcity and climate change.

Along with boosting production and resilience, equally critical will be creating food supply chains that better connect farmers in low- and middle-income countries to urban markets – along with measures which ensure access for consumers to nutritious and safe food at affordable prices, such as such as pricing policies and social protection programs, it says.

Trends and challenges

The report identifies 15 trends and 10 challenges affecting the world’s food systems:

15 trends

- A rapidly increasing world population marked by growth “hot spots,” urbanization, and aging
- Diverse trends in economic growth, family incomes, agricultural investment, and economic inequality.
- Greatly increased competition for natural resources
- Climate change
- Plateauing agricultural productivity
- Transboundary diseases
- Increased conflicts, crises and natural disasters
- Persistent poverty, inequality and food insecurity
- Dietary transitions affecting nutrition and health
- Structural changes in economic systems and employment implications
- Increased migration
- Changing food systems and resulting impacts on farmers livelihoods
- Persisting food losses and waste
- New international governance mechanisms for responding to food and nutrition security issues
- Changes in international financing for development.

10 challenges

- Sustainably improving agricultural productivity to meet increasing demand
- Ensuring a sustainable natural resource base
- Addressing climate change and intensification of natural hazards
- Eradicating extreme poverty and reducing inequality
- Ending hunger and all forms of malnutrition
- Making food systems more efficient, inclusive and resilient
- Improving income earning opportunities in rural areas and addressing the root causes of migration
- Building resilience to protracted crises, disasters and conflicts
- Preventing transboundary and emerging agriculture and food system threats
- Addressing the need for coherent and effective national and international governance. ❁



Bayer's IPM – real support for food industry pest management

Well known worldwide for providing the very best food safe products and materials for use in pest management services to the food industry, Bayer have taken extra steps to assist contractors in this important and highly sensitive industry sector. The following article from Bayer introduces Integrated Pest Management (IPM) and Bayer's risk assessment platform. It will be of great interest to food processors and food industry quality managers as they address protection from pests.

Bayer Pest Control Strategies and Best Practices

One of the great challenges of pest control is how easy it is to take for granted. Throughout history disease spread by pests has represented a serious health risk, particularly in urban environments. Our management of these diseases and their transmission has made it easy to overlook the importance of effective pest management, but without the work that is done in the area we would soon face the resurgence of some very dangerous diseases.

Beyond acting as disease vectors, pests such as rodents, birds, cockroaches and flies can transfer contaminants between unsanitary and sanitary areas, can damage buildings and equipment, and can most certainly do damage to brands when encountered by clients.



Effective pest control requires planning

Today, while as a society we understand that pest control is essential in an urban environment we have little understanding of what's involved. Certainly there is limited insight into the role of the pest manager and the technical complexity often dealt with in implementing an effective pest management program. This is not limited to residential pest management, with commercial clients often underestimating this complexity as well. Their appreciation for the challenge is often increased when we remind site quality managers that pests are the only safety risk they have on site that will actively avoid being managed!

Given that pest management in sensitive manufacturing sites is perhaps the only critical quality process that is outsourced, a detailed understanding of basic IPM principles is a valuable thing for a site quality and safety manager to possess. We constantly hear from pest managers that the best results are achieved when

there is a great working relationship between them and their client. When the client understands and is engaged in the programme all elements of the IPM plan can be addressed.

With this in mind, the best place to start an IPM plan is with a discussion between the PCO and the client. The PCO needs to be informed of any history of pest activity, the physical structure of the facility, the processes conducted inside, as well as the roles and responsibilities of those working on site. Importantly, the PCO needs to also be made aware of any food safety standards implemented on the site so that the pest management plan can be developed with these standards in mind.

The IPM plan will be made up of four main elements:

- Inspection and assessment
- Establishment of action thresholds
- Implementation of control strategies
- Review, monitoring and reporting

In the first stage, inspection and assessment, the pest manager will make detailed site inspection in which all potential risk factors will be identified. It is advisable for site management to be as involved in this process as possible because many of these risk factors may need to be addressed by site management.

It is advisable that anyone responsible for site safety and quality establish a basic understanding of pest management principles. Bayer Environmental Science offers an online risk assessment tool, developed for anyone looking to establish that basic knowledge so they can become better engaged with their pest manager and play an active role in developing strategy to stop pests entering the building. The tool takes the user through a systematic assessment of their facility, taking into account more than 40 common risk points.

According to David Ross from Bayer "We know that the best IPM programmes rely on a strong working relationship between the site staff and the pest controller. In our experience, the best results occur where there is clarity around procedures and the responsibilities of both parties".

The Bayer site Risk Assessment tool is available at www.environmentalscience.bayer.co.uk, or just google IPM Bayer. Based on the risk assessment, a site pest management plan will be developed. This first and foremost will focus on pest-proofing the facility, or in other words, putting into place physical measures and workflows that reduce the likelihood of pests gaining access to the premises. This may be influenced by numerous factors, not the least of which may be climate, geography, neighboring properties, the layout of the site and the condition of the building itself.

It is likely that there may be some building repairs, modifications, or changes to site processes recommended. As these will be captured as part of the site plan it is very important that these recommendations are carried out, otherwise it may be concluded that the pest management plan was not appropriately implemented. This again underpins the importance of a close working relationship between the pest manager and the site safety manager.



Bayer's online risk assessment tool makes it possible for everyone to understand pest-related challenges

Inside the site, they type of materials processed and product produced can have bearing on the type of pests one may expect to find. The processes around import and export of raw and finished goods, site hygiene and staff practices will also be taken into consideration.

Once one can conclude that certain pests may be attracted to the site the plan will need to acknowledge the 'action thresholds' or rules by which a pest infestation may be defined and declared a problem. This will take into consideration not just the likelihood of the pest being present, but also the severity of the problems that may be caused by the pest.

Next the plan will clarify pest monitoring devices and procedures, as well as an inspection schedule. An effective plan will also include clear directions for site staff to play a role in the early detection of pests and formal recording of this activity. It is advisable for site staff to undertake basic pest identification training so they can identify and escalate any signs of pest activity.

All this activity will ultimately be captured in a regular series of reports. The reports don't just reveal the status of the

site with regard to pest activity. They also provide assurance that all the correct preventative measures and inspection procedures have taken place. This is especially important in an environment where safety audits are a regular requirement. Reporting documentation will capture the details of any pest control products used on site along with all their details. The reports should of course also capture the details of any pest activity and the corresponding corrective actions. Capturing this data enables the development of a trend analysis over time, which can be used to achieve and demonstrate continued improvement in pest management.

This is just a brief outline of what goes into a good integrated pest management plan, but it should serve to demonstrate that effective pest management can never be an afterthought. With a sound understanding of the site's risk points, and detailed planning, monitoring and reporting you can have confidence that you and your pest manager are working together for the best possible results.

Bayer manufacture a number of pest management products which are particularly suitable for use in food industry programmes. With certification from HACCP International, those products carrying the mark and available worldwide, have undergone a rigid due diligence process to meet the demands and risk profile requirements of the world's leading food safety schemes and HACCP International's standard – Pest Management for Food Businesses. Certified products from Bayer include *Maxforce*, *Tempriid*, *Suspend* and *Crackdown*. *

For a full list of certified food safe products, please contact Bayer or check the register at www.haccp-international.com



With more than 150 years in pest management, Bayer is dedicated to applying our mission of Science for a Better Life to the food industry.

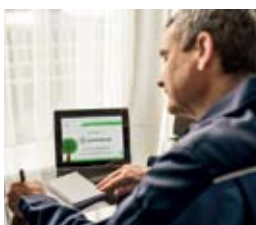
We can assist you with thorough and independent risk assessment and consultation to underpin the best possible Integrated Pest Management (IPM) program. Bayer will then work with best in class Professional Pest Managers to keep your site pest free and audit compliant.



Consultancy

Independent assessment of your pest control needs.

- On-line risk assessment tools.
- On-site risk assessment.
- Formal IPM planning.



Training

Training programs tailored to meet your specific needs & audit requirements.

- On-line training for food industry teams.
- On site team training, specific to industry & site specifications.



Partners

Global network of experienced pest management operators.

- We work with partners to deliver consistent standards across the globe.
- Our network is backed by local and global Bayer technical experts.



Products

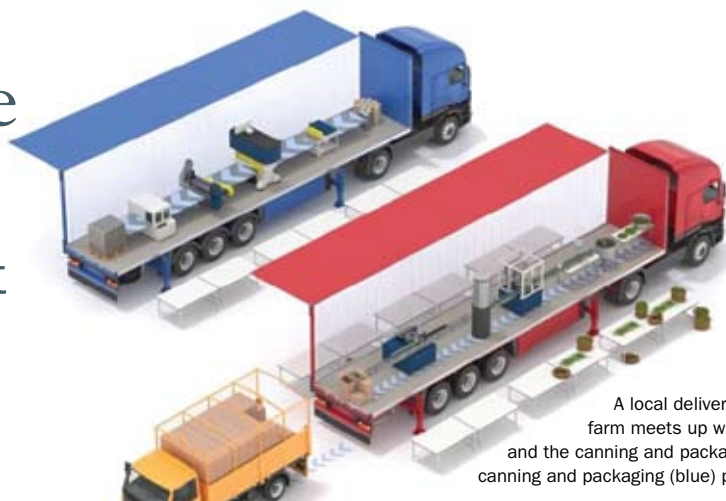
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Tata Steel Europe develops innovative mobile canning concept to cut food loss



A local delivery vehicle from farm meets up with processing and the canning and packaging (red) and canning and packaging (blue) pantechnicons

The mobile canning line concept would allow farmers to process and preserve food onsite, massively reducing food loss.

Tata Steel has developed a mobile canning line concept which will allow farmers, anywhere in the world, to process and preserve their produce on site, helping to reduce food loss dramatically at source whilst generating additional revenues for farmers.

According to the United Nations Environment Programme, a third of all food production worldwide is lost or wasted before it even reaches consumers including the postharvest handling, storage, processing, packaging and distribution stages.

Tata Steel's mobile canning line concept will allow producers to establish a production line to make cans and fill them with fruit or vegetables on site. This means crops can be preserved quickly before spoiling, reducing food loss.

Protact® circular blanks will be fed directly into the canning line, housed in one of the two trucks, saving space and reducing scrap from steel sheets.

Once created, the Protact® cans will be brought to the filling truck for processing. Fruit and vegetables will be sorted to ensure optimal quality and will then be washed, prepared, canned, seamed, sterilised, visually checked and labelled all in situ. Filled cans will then be loaded directly onto the trucks ready for distribution to consumers.

Steven Dijkstra, Head of Marketing Packaging & Nordics at Tata Steel in Europe, commented:

'In India, 44 per cent of food harvested is lost before it reaches consumers through the postharvest stages, often because it simply cannot be packaged and preserved quickly enough.'

'Tata Steel's mobile canning line will allow farmers, even in the remotest of rural areas, to preserve their harvest, producing canned foods, ready for distribution on site. In India alone, we

Tata Steel's mobile canning line will allow farmers, even in the remotest of rural areas, to preserve their harvest."

The Tata Mobile System. Local vehicles service delivery to the mobile plant and distribution of packaged goods



The mobile canning and processing line will include two trucks, housing the canning line and food processing facilities, which will be able to move directly to any farm or field and distribution trucks will collect and deliver cans straight from the farm.

The process will make two-piece, drawn and redrawn (DRD) cans, which are easy to produce and are very durable. The cans will also be made from Tata Steel's Protact®, a specialist laminated steel with a polymer coating. Due to the unique characteristics of Protact® there is no need for lacquering, simplifying the canmaking process and presenting downsizing opportunities.

have the potential to save 84 million tonnes of food per year.'

'And, as we know, canned foods retain high quantities of nutrients and also have a longer shelf life than their non-canned counterparts helping to decrease food loss and waste further still.'

Tata Steel's mobile canning and processing line is set to be in use within the next three years. Tata Steel is currently in discussion with a number of interested parties across the world to bring this concept to life. ❄

For further information, go to:
www.tatasteeleurope.com



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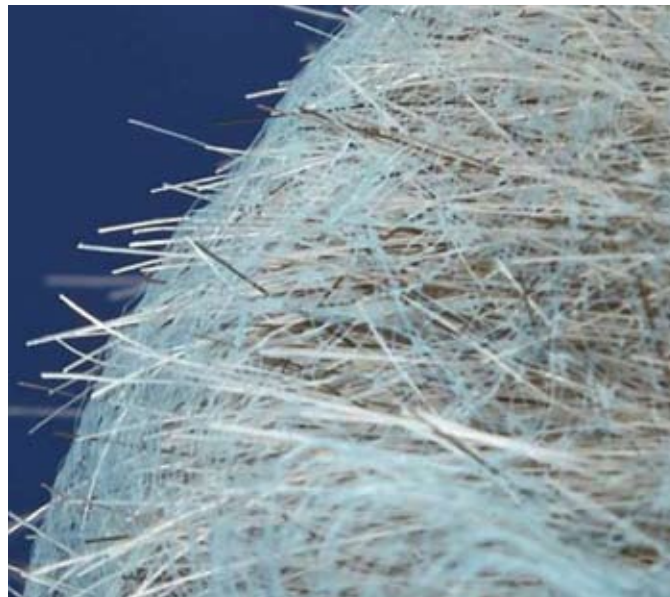
Effective hair nets reduce contamination

Hair contamination is still an issue. Customers are being put off brands by discovering hair in their products. You don't have to look far on social media to find evidence of this. It's shocking when simple preventative measures can be put in place. Adopting HACCP International certified hair restraints means complaints can be reduced by up to 80%.

Aburnet's HairTite, KleenCap, HairTite Lite and Tek-Chef brands are recommended and certified by HACCP International. Importantly, Aburnet produce products for different areas such as neck, beard, arm, nape amongst others as it is not just the scalp that poses the risk. For instance, beard hair can be an involuntary target of touch posing a significant risk.

Our StayCool technology increases comfort which reduces the user's tendency to fidget or scratch. This reduces the risk of the food handler being a cross vector of pathogens found on the scalp, such as Staphylococcus Aureus, this can occur even if the individual is gloved. Fidgeting can also disturb the hairline and push hair through the fabric increasing contamination risk.

Join other leading businesses and reduce hair contamination. Get in touch for your free trial and our free training and auditing tools. ❄️



This pictured 12 GSM mob cap is not certified and illustrates the issue.

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‘DIRTY MEAT’:

Shocking hygiene failings discovered in US pig and chicken plants

By **Andrew Wasley**

Previously unseen government records detail ‘deeply worrying’ incidents in pork and poultry plants, raising fears of ‘dirty meat’ entering the UK under a post-Brexit trade deal.

All of the reported breaches resulted in immediate remedial action with no risk posed to consumers, according to the companies involved.

Shocking hygiene failings have been discovered in some of the US’s biggest meat plants, as a new analysis reveals that as many as 15% (one in seven) of the US population suffers from foodborne illnesses annually.

A joint investigation by the Bureau of Investigative Journalism (TBIJ) and the Guardian found that hygiene incidents are at numbers that experts described as “deeply worrying”.

US campaigners are calling once again for the closure of a legal loophole that allows meat with salmonella to be sold in the human supply chain, and also warn about the industry’s push to speed up production in the country’s meat plants. And UK campaigners warn that the UK could be flooded with “dirty meat” if a US trade deal is signed post-Brexit.

The unpublished US government records highlight numerous specific incidents including:

- Diseased poultry meat that had been condemned found in containers used to hold edible food products;
- Pig carcasses piling up on the factory floor after an equipment breakdown, leading to contamination with grease, blood and other filth;
- Meat destined for the human food chain found riddled with faecal matter and abscesses filled with pus;

- High-power hoses being used to clean dirty floors next to working production lines containing food products;
- Factory floors flooded with dirty water after drains became blocked by meat parts and other debris;
- Dirty chicken, soiled with faeces or having been dropped on the floor, being put back on to the production line after being rinsed with dilute chlorine.

All of the reported breaches resulted in immediate remedial action with no risk posed to consumers, according to the companies involved.

But campaigners warned that other violations may go undetected. Tony Corbo, senior lobbyist with *Food and Water Watch*, said: “While the inspectors are able to cite the plants for hundreds of violations per week, I am confident that they are not catching every instance of unsafe practices being committed in these plants.”

Meat hygiene inspectors interviewed by the Guardian agreed, saying fast line speeds and other pressures in some plants meant it was “inevitable” that some breaches slipped through the net.

The findings are worrying, according to Prof Erik Millstone, a food safety expert at Sussex University, “because of the risks of spreading infectious pathogens from carcass to carcass, and between portions of meat. The rates at which outbreaks of infectious food poisoning occur in the US are significantly higher

than in the UK, or the EU, and poor hygiene in the meat supply chain is [a] leading cause of food poisoning in the US.”

The Bureau and the Guardian obtained previously unpublished documents relating to 47 meat plants across the US. Some of the documents relate to certain companies, including Pilgrim's Pride, one of the US's biggest poultry producers, and Swift Pork. Although not a comprehensive portrait of the sector - there are around 6,000 US plants regularly inspected by Food Safety and Inspection Service (FSIS) - the documents provide a snapshot of issues rarely detailed in public which has rung alarm bells with campaigners in both the US and UK.

“The US meat industry has a responsibility to clean up its act,” said David Wallinga, senior health officer at the Natural Resources Defence Council, which obtained some of the documents. He said the Pilgrim's Pride records detailed “numerous food safety violations.”

Kerry McCarthy, former UK shadow environment minister and Labour MP, called for urgent reassurances from both the UK Food Standards Agency (FSA) and “the top of government” that standards would not be allowed to slip as trade negotiations with the US get underway.

“We cannot allow this to be a race to the bottom. We should insist the US raises its standards, and guarantees food safety, before we are prepared to allow in US meat imports,” she said. McCarthy has written to the environment secretary, Michael Gove, and Liam Fox, the trade secretary, to raise the matter.

The documents seen by the Bureau and Guardian do not reveal the full numbers of non-compliance reports across the whole sector. However, one dataset covering 13 large red meat and poultry plants over two years (2015-17) shows an average of more than 150 violations a week, and 15,000 violations over the entire period. Thousands of similar violations were recorded at 10 pork-producing plants over a five-year period up until 2016, further documents show.

Another batch of previously unpublished documents shows frequent failings at 24 plants operated by Pilgrim's Pride who recently bought the British chicken giant, Moy Park Ltd. The company slaughters 34 million birds each week and produces one in five of the chickens in the country.



More than 16,000 non-compliance reports on Pilgrim's Pride operations detail 36,612 individual regulatory violations - an average of 1,464 a month - at the 24 plants during a 25-month period between 2014 and 2016.

In one incident, diseased meat – condemned from entering the human food chain – was placed in a container meant for edible product. An inspector discovered “carcasses of poultry showing evidence of septicaemic disease...carcasses showing evidence of having died from other causes than slaughter...guts of carcasses, [and] poultry carcasses with heads attached.” He requested that the condemned items be removed. A similar incident was recorded some days later.

One inspector saw chicken drumsticks piling up on the floor, and instructed workers to pick them up “to be reconditioned with chlorinated water.” Again, a similar incident had occurred previously. In another incident in a bagging department, 36 shrink-wrapped whole birds were found scattered on the floor. An inspector noted: “in my presence the establishments began initiating their corrective action by picking up all affected product off the floor...to be carried to the establishment's designated wash station to be thoroughly rinsed off.”

Meat soiled with faecal matter was also recorded, with an inspector noting “... I observed a poultry intestine in the liver bin. The intestine was approximately 6.5 inches long and had visible faeces oozing out both ends.” The incident resulted in the livers being condemned from the human food chain.

At another Pilgrim's Pride plant, the records reveal how deficient equipment led to a carcass becoming contaminated with faeces. “I observed one of my 10 test birds with a spot of faecal matter on the exterior of the right thigh. The spot of faecal [sic] was...brownish green in colour and had a pasty consistency,” an inspector notes. The affected bird was “retained by management for review then sent to reprocessing for reconditioning with chlorinated water.” Similar carcass contamination had been recorded before.

Internal FSIS records also highlight numerous violations at meat plants producing pork. In an incident recorded at a plant run by Swift Pork, owned by meat giant JBS, 48 pig carcasses were found to have fallen on the floor because of defective equipment, leading to contamination with “black trolley grease, floor grime and bloody smears”. The records noted: “The line was stopped for about 15 minutes. The carcasses were sent to be trimmed first then steam vacuumed with 180F water.”

On another occasion, an employee cleaned the factory floor with meat products on an adjacent conveyor belt, creating a mist that could contaminate the meat. “This mist is contaminated by the inedible debris and...comes into contact with edible product,” an inspector observed.

In a separate incident, a pig's head was found to have partially covered a drain, leading to “bloody waste water filling the area”. This and another blockage caused by a build-up of skin led to dirty water flooding other areas. “Because of the plugged drains, an insanitary condition was created; the bloody water in the walkway could be splashed and carried throughout the kill floor after employees walked through the puddle,” an inspector wrote.

In a different part of the factory, inspectors found a stainless steel handwash sink “plugged and approximately one-quarter full of standing bloody water with pieces of fat and meat. Production employees use this sink to clean and sanitise their hands and gloves. This creates an insanitary condition.”

In a statement, JBS, which owns Pilgrim's and Swift Pork, said all of the violations recorded were “immediately addressed” and that consumers were never put at risk. “The US meat and

poultry sector is one of the most highly regulated industries in America,” said Al Almanza, JBS’s global head of food safety and quality assurance, and former head of FSIS for 39 years. “Non-compliance reports are issued by USDA [United States Department of Agriculture] inspection personnel to document when an establishment has not met a specific regulatory requirement. However, the vast majority of non-compliance issues are addressed immediately and have no impact on food safety.”

One bug alone, salmonella, causes around 1m illnesses per year in the US.”

“All of the documented incidents regarding JBS [Swift Pork] and Pilgrim’s were immediately addressed by our facilities. None of these incidents put anyone at risk or resulted in any adulterated product released into commerce. Food safety is achieved by implementing processes that consistently detect and correct issues before products are released into commerce. Our team at JBS and Pilgrim’s is committed to the highest food safety standards and we partner with USDA each and every day to ensure that consumers can enjoy safe and quality products with confidence.”

The US has shockingly high levels of foodborne illness,

according to a new analysis by UK pressure group Sustain. It says that annually, around 14.7% (48 million people) of the US population is estimated to suffer from an illness, compared to around 1.5% (1 million) in the UK. In the US, 128,000 are hospitalised, and 3,000 die each year of foodborne diseases.

One bug alone, salmonella, causes around 1m illnesses per year in the US, while in the UK the numbers of officially recorded incidents is relatively low, with just under 10,000 laboratory confirmed cases in 2016. However, unreported incidents could substantially increase those numbers. Salmonella takes hold on farms and is found in the guts of poultry and livestock: farm animals and birds can become contaminated with faeces containing the bacteria during transport to abattoirs, where slaughter and processing procedures can also spread it.

Kath Dalmeny, chief executive of Sustain, said the figures underscored concerns about future US-UK trade deals: “The US has already warned us that we will need to lower our food standards in exchange for a quick trade deal, but we need to fight this hard. They are desperate to sell us their chlorine-washed chicken, but we know chlorine and other unpalatable treatments can mask dirty meat, low hygiene standards and poor animal welfare, which the UK consumer will not stand for.

“In recent years, the UK meat, dairy and egg industries have improved food safety; so we should all be alarmed about any trade deal that opens up our market to products that undermine this progress. ❀

Credit: The Guardian

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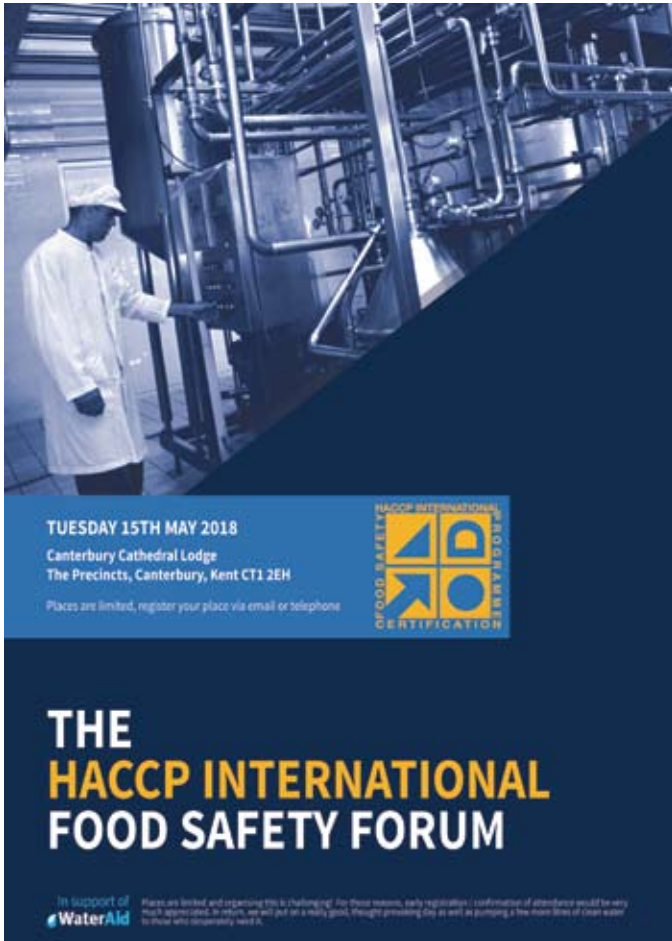
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HACCP International Food Safety Forum



On Tuesday 15th May 2018 HACCP International will be hosting its first food safety forum, which quite possibly for the first time, brings together all stakeholders within the food industry, including retailer, food manufacturing, food-service and those supplying equipment, materials and services to the food industry. It's not often that delegates have the chance to rub shoulders with such a diverse range of food industry professionals, with most seminars and forums being aimed at certain sectors only, such as food manufacturing or hotel/restaurant.

Delegates will have the chance to hear, and engage in, presentations covering a wide range of important topics including the roll out and implementation of the HACCP International Standard for Pest Management Services for Food Businesses, the ever-increasing importance of cyber security control within the food industry, the growing influence of blockchain technology and the need to consider, objectively, the current and future trends in hand hygiene control.

Given the number of nonconformities raised against the integrated pest management system in third party audits, the coming of the Standard for Pest Management Services for Food Businesses is timely. During the forum we will explore the

protocol for audit and the content of that standard, with the ultimate aim of driving better communication between pest controller and food business and improving conformity and of course food safety alongside that. Richard Werran, Head of Food for BSI (EMEA), takes to the stage to bring us up to date on the forthcoming changes to Issue 8 of the BRC Global Food Safety Standard. He concentrates on the dangers, which really are very serious, of ignoring cyber-attacks on the IT infrastructure operated in the food industry. Richard provides sound guidance on mitigating the risk from those attacks, through a valid cyber security protocol. Mr Louis de Bruin, from the European blockchain project leadership team, for IBM, then takes us on a journey to discover the birth of blockchain and how it is now being successfully trialled as a cloud-based ledger system in the food industry to ensure transparency of HACCP control amongst all the stakeholders within the food supply chain. This is a subject that won't just "go away". We are looking at the future of food safety control, so this is a wonderful opportunity to be involved at an early stage!



The forum is being held within the business centre, in the precincts of the World Heritage UNESCO site Canterbury Cathedral Lodge. Canterbury now benefits from being one of the destinations along Britain's true high speed rail service "High Speed 1". Enjoy the journey and we all look forward very much to seeing you there! If you put this link www.haccp-international.com/uk-food-safety-forum/ into your browser it will take you to the registration page on the HACCP International website. Oh, and did we say? There is no charge for this event. We'd rather invite some pledges and donations to our chosen charity for this year – Water Aid. Details on our website! ❁



Seizing opportunities in the Asian Halal Industry through Regulatory Standardisation

By **FIA Communications**

As global demand for halal-certified products grows, there is a need for halal certification bodies across the Association of Southeast Asian Nations (ASEAN) to collaborate toward a standardised halal regulatory framework for the region. The absence of a unified certification system presents bottlenecks for halal businesses and, ultimately, impedes cross-border halal trade.

At the Global Trade Development Week (GTDW) on Halal Trade, Manufacturing & Logistics Summit & Exhibition in Kuala Lumpur earlier this year, experts from across various industries discussed the opportunities and challenges across halal industries at national, regional and global levels. Food Industry Asia (FIA), through the representation of Ms Teresa Lo, its Regulatory Affairs Assistant Manager, participated in two panel discussions on “Exploring Updates on Global Halal Regulations” and “Standardisation of Global Halal Regulations: The Corporate Perspective”.

Standardisation of halal regulations: The corporate perspective

During the panel discussions, Ms Lo shared her observations on the landscape of halal regulatory frameworks in Southeast Asia. A comparison across countries showed differences in frameworks – some countries, such as Singapore, have set in place a single halal governing authority that also serves as the halal certification body, while others, such as the Philippines, have multiple certifying bodies, with each operating independently of one another.



Ms Teresa Lo, Regulatory Affairs Assistant Manager, Food Industry Asia (FIA), addresses the audience during a panel discussion on the “Standardisation of Global Halal Regulations: The Corporate Perspective” at the Global Trade Development Week (GTDW) on Halal Trade, Manufacturing & Logistics Summit & Exhibition in Kuala Lumpur, Malaysia, on 5 February 2018. Photo credit: KW Group – Global Trade Development Week

A lack of unification of a halal certification system poses challenges for companies operating in the halal space. Due to the lack of recognition between halal certification bodies, companies that export to different markets would need to gain and maintain multiple halal certifications to fulfil the requirements of the certifying bodies in each exporting market.

Presenting an industry proposal, Ms Lo called for a mutual recognition agreement among ASEAN halal certifying bodies in order to ease cross-border halal trade and improve market access across countries, in line with the vision for an ASEAN Economic Community (AEC). Panellists agreed that there is a need for halal certification bodies to work in a collaborative manner, and to identify a leader to drive forward the discussion on the standardisation of halal regulations.

The call for collaboration among halal certification bodies to address the need for a standardised halal framework and mutual recognition is further echoed in light of the different practices observed across bodies – a result of diverse schools of thought concerning varying interpretations of Islamic laws. An example of such practices is the process of electronic stunning of animals and birds prior to slaughter, which is practised in countries like Malaysia and Singapore, but is not allowed in Brunei.

Therefore, it is important that halal certification bodies are aligned through agreement on fundamental parameters in order to ensure halal assurance and, at the same time, ensure that any differences do not compromise efforts to meet halal requirements. During the panel discussions, the Standards and Metrology Institute for Islamic Countries (SMIIC) was suggested as a platform to drive the standardisation process. The SMIIC was established for the harmonisation of standards among the Organisation of Islamic Cooperation (OIC) countries, through the creation of common standards to achieve uniformity in the areas of metrology, laboratory testing and the setting up of conformity assessment schemes.

Growing demand for halal products and halal hub status

According to the Pew Research Institute, there were 1.8 billion Muslims worldwide as of 2015, accounting for nearly one-fourth of the global population. The majority of Muslims are concentrated in the Asia Pacific and Middle East-North African regions: In 2010, nearly two-thirds – more than 986 million – Muslims were living in Asia Pacific, and 93 per cent of the approximately 341 million Middle-East-North African inhabitants were Muslims. While this contributes to growing global demand for halal products, non-Muslim countries such as Japan and South Korea are also experiencing increased consumer demand for halal-certified products,

spurred by the internationalisation of products and a greater number of Muslim visitors, and are thus looking to boost halal developments as they venture into the halal food and beverage industry.

Greater demand for halal-certified products has led to an expansion of the sector beyond the F&B segment, and with it, the need for halal standards across segments to move at the same pace – if not ahead – of the growing trends.

In Malaysia, Malaysian Standard (MS) 2424:2012 was developed to provide halal standards for pharmaceutical products, in line with the country's continued efforts to position itself as the global halal hub.

The Philippines introduced the implementation of rules and regulations for the Republic Act No. 10817, instituting the Philippine Halal Export Development and halal promotion programme, in July 2017. This was to enhance the exportation of halal products by necessitating that halal certification of products be issued by certifying bodies accredited by the Philippine Accreditation Bureau.

At the same time, the new halal law introduced in Indonesia in 2014, with a targeted enforcement date in 2019 under the governance of the Halal Products Certification Agency (Badan Penyelenggara Jaminan Produk Halal, BPJPH) and overseen by the Ministry of Religious Affairs, states that goods and services related to food and beverage, drugs, cosmetics and consumer goods that are worn, used or utilised by the public, must be halal-certified. This extensive halal scope is unprecedented, and recent changes to the



governance structure have been seen as a move to present Indonesia as a halal nation.

FIA issues regular e-bulletins with analysis on relevant food and beverage industry issues across the region. ❄



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COOL YOUR ENERGY COSTS

by **Martin Stone**,
Technical Director, HACCP International

Refrigeration systems are a critical element of any food business needing to preserve perishable items or cool products for sale. The way in which you operate your equipment can play a major part on saving on your energy bill. Martin Stone from HACCP International describes practical ways for reducing energy costs of cold storage.

The cost of energy is high and getting higher. In many operations, energy is the number one overhead cost in the business. Refrigeration and in particular cool room storage is notorious for the high running cost but this is something you can improve.

Lets start with some basics;

According to the second law of thermodynamics, heat flows from the hotter to the colder. Think about this in regard to your refrigeration system.

Heat gets into your coolroom in four main ways (think of them as heat load);

- It is in your product that you need to cool down
- It seeps through the walls, floors, ceiling and floors
- It enters with warm air when the doors are opened
- It is generated from energy using machinery and lights inside the coolroom

Once the heat gets in, it transfers to the air circulating within the coolroom. It is this air that the refrigeration system has to remove heat from...and the harder that system has to work, the more energy is required.

So lets look at the above heat loads to try and reduce running costs.

In many operations, energy is the number one overhead cost in the business.”

Product Loads

- Load hot product when cool or cooler if possible. For example, product coming from an oven, can be cooled to room temperature using environmental air flow prior to loading into a coolroom.
- Load goods into refrigerators when they are cool - avoid storing goods in hot areas such as in direct sun on a loading bay.
- Transfer pre-cooled products as quickly as possible from one refrigerated environment to another.

- Storing goods in a cool area before loading will reduce the time needed to cool and therefore reduce energy consumption.
- Defrost frozen goods in the coolroom.
- Don't forget about logistics equipment such as pallets. Ensure these are kept as cool as possible prior to being loaded and then inserted into the coolrooms.



Misa's patented failsafe fastener system eliminates panel gaps, heat leakage and food safety risks.

Environmental Loads

- Ensure seals around doors are in good condition and not allowing leakage of air.
- Locating refrigeration equipment in cool positions will reduce energy use significantly. Hot locations, such as near cooking equipment or heated display units and in direct sunlight should be avoided.
- Ventilate ceiling space above coolrooms to reduce heat buildup. Shading roofing in above coolrooms has also been effective in hot sunny areas.
- Provide good ventilation around the condenser coils and fans and locate in a cool space.
- Locate freezers next to (sharing at least one wall with) coolrooms
- Upgrade insulation where possible and particularly near to external heat sources.

Open Door Loads

- Don't leave doors open when entering and leaving cool rooms. Self-closing doors are useful, but may not be suitable for all applications.
- Plastic strip curtains or swinging doors are good options for frequently accessed coolrooms. Automatic doors and those operated by remote control may also be suitable.
- Avoid frequently entering coolrooms for small quantities of product. Consider keeping high-turnover products in a separate, smaller refrigerator.
- Design freezers so that the entry door is through coolrooms



Misa manufacture and use the latest technology in cold room design and construction to generate significant efficiency.
For more information visit www.misa-coldrooms.com

Internal Equipment Loads

- Turn anti-sweat heaters off when not required.
- Turn lighting off when not required. Automatic timers and occupancy sensors may be helpful.
- Invest in efficient lighting that generates less heat

And finally, there are options to improve efficiency and lower costs by maintenance of the refrigeration equipment itself.

- Set thermostat to avoid overcooling merchandise. Freezer set points can often be reduced.
- Regularly check and maintain door seals.
- Defrost evaporators regularly (if not auto-defrost).
- Defrost freezers when ice build-up reaches 5mm thick.
- Keep condenser coils clean.
- Check that equipment is running smoothly and quietly.
- Check that the compressor is cycling on and off regularly.
- Regularly check for damaged insulation, poorly fitting doors and damaged seals. Coolrooms are often subject to relatively harsh treatment and may sustain damage that reduces performance.

Considering the above options and religiously following the maintenance requirements can drastically lower your energy costs whilst maintaining an appropriate environment for your perishable food.

Martin Stone has worked with some of the world's largest users of coolroom and frozen storage space. ❄



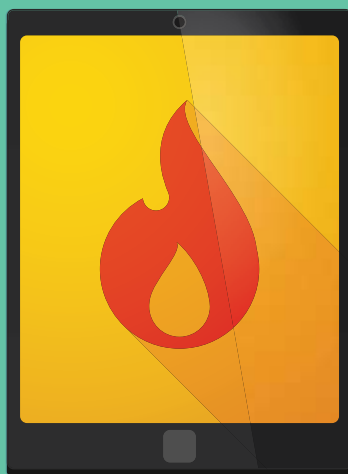
Welcome to Ron Vail, HACCP International's new Vice President – Americas



HACCP International is delighted to welcome Ron Vail to its organisation. Ron is a very well-known figure in The United States' food safety arena through the extensive coverage offered by his company, ACET Global Consulting. Ron and his team have now taken on the representation of HACCP International in the region

and his team's food technology skills and their combined experience means that we now have significant resources available in North America. The office is situated in Denver, however Ron and his team travel broadly throughout the continent and to Hawaii. Commercial Director, Clive Withinshaw said, "Having Ron and his team on board is a massive and much needed boost to us as demand for our mark and technical skills accelerates. With clients as diverse as 3M and Industrial Magnetics at one end of the country and the likes of Silikal, Flowcrete and Kimberly Clark at the other, Ron's technical team have had to hit the ground running – or flying! ❄

Ron can be contacted by email – ron.vail@haccp-international.com or through our website.



HOT LINKS

Specialist food industry lawyers in the land of litigation

www.marlerclark.com

Lots of food safety news here from the land of litigation! Marler Clark was established in 1998 bringing together top attorneys for the plaintiffs in the landmark litigation arising from the '1993 Jack in the Box' E. coli O157:H7 outbreak in the United States. It is now one of the nation's foremost law firms representing many victims of foodborne illness. Their news stories make for good reading.

Asia Pacific Food Industry

www.apfoodonline.com

A useful online publication that complements their well circulated journal. This site keeps you informed of developments and concerns in this regions and reports on interesting case studies and product news. Food safety is featured frequently and the events calendar gives a comprehensive diary of the most significant shows, meetings and conferences.

European Food Safety Authority

www.efsa.europa.eu

From honey bees to antimicrobial resistance, the site has a plethora of information about big topics and their impact and relationship with food safety. Highlights and events keep the information current and worth a routine drop in.

The science of cooking

www.scienceofcooking.com

And whilst on science, this page seeks to explain all in regard to cooking. Why do cooked foods brown? What is flavour and Umami? The answers to these questions and more here.

Bright Green Wastewater Solutions

www.constructedwetland.co.uk

Dealing with food processing plant effluent is an issue for many of us in the food industry. Over the years, excellent technologies have emerged like anaerobic digestion that converts waste to biogas and organic sludge. But to really go green, consider the possibilities of an artificial wetland! This site is a great starting point for information on the possibilities of the technology and promotes the application of constructed wetlands for wastewater treatment. ❄

Bottled water tests show we are consuming microplastics in what might be alarming quantities



New Orb Media research and reporting shows that a single litre of bottled water can contain thousands of microplastic particles. Exclusive tests on more than 250 bottles from 11 leading brands worldwide reveal widespread contamination with plastic debris including polypropylene, nylon, and polyethylene terephthalate (PET). While the effects of this on human health are not addressed at this stage, it will be of concern to the industry.

Microscopic plastic particles fluoresce under a blue crime light and are seen through an orange filter. Orb Media and researchers at the State University of New York in Fredonia performed exclusive tests on more than 259 bottles of drinking water from Europe, Asia, Africa, and the Americas reveal galaxies of microscopic plastic particles.

Plastic was identified in 93 percent of the samples and the global average of tested products was 325 particles per litre. Particle concentration ranged from zero to more than 10,000 likely plastic particles in a single bottle. The

study was supervised by Dr. Sherri Mason, Chair of the Department of Geology and Environmental Sciences at the State University of New York at Fredonia, a leading microplastics researcher.

Brands tested included *Aqua* (Danone), *Aquafina* (PepsiCo), *Bisleri* (Bisleri International), *Dasani* (Coca-Cola), *Epura* (PepsiCo), *Evian* (Danone), *Gerolsteiner* (Gerolsteiner Brunnen), *Minalba* (Grupo Edson Queiroz), *Nestlé Pure Life* (Nestlé), *San Pellegrino* (Nestlé), and *Wahaha* (Hangzhou Wahaha Group).

Samples came from 19 locations in nine countries on five continents including Brazil, China, India, Indonesia, Kenya, Lebanon, Mexico, Thailand, and the United States. The majority of the samples came in plastic bottles. Interestingly, water in glass bottles also held microplastic. ❄

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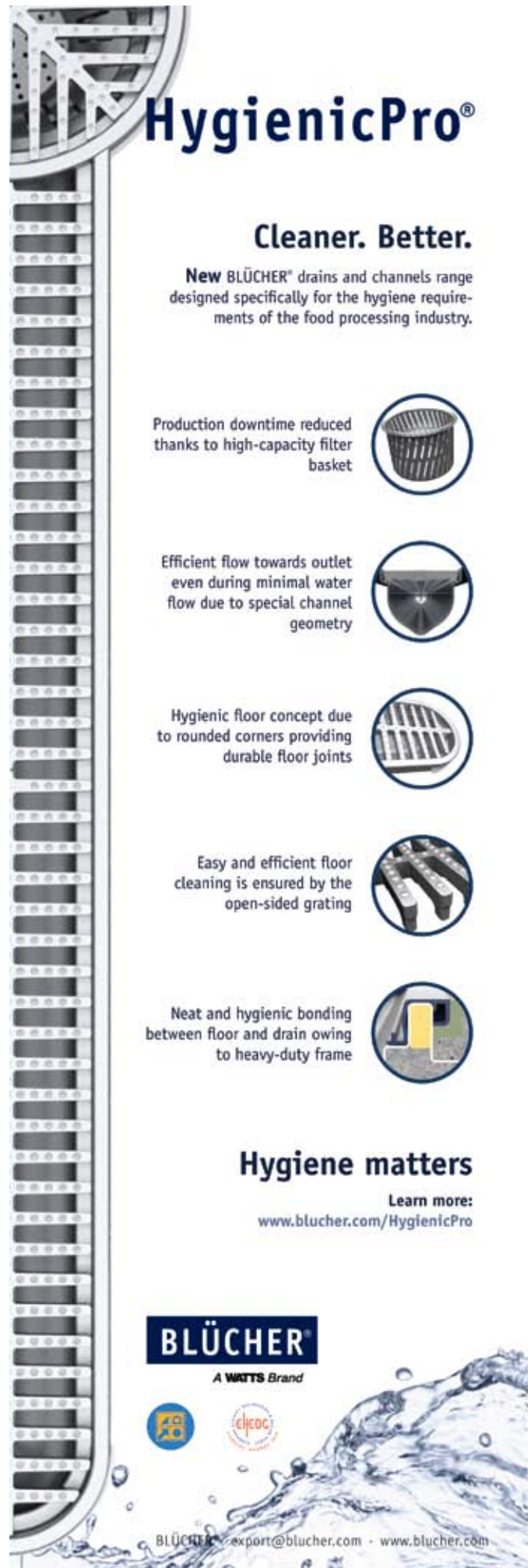
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FACTERIA

What rhymes with Auld, Bold,
Cold, Fold, Gold, Hold etc...
Yes Mold! (or Mould)

Mould exists in thousands of species and are literally everywhere. They consist of filaments known as hyphae, reproduce with fruiting bodies and spores and derive their energy from the material they are living upon. Various species of mould are capable of growth through a wide range of environmental conditions, most notably, compared to bacteria, growth in low water activity foods such as bakery products, jams and nuts.

Like bacteria, some species are capable of producing toxins in food which can lead to illness.



Various species of mould from genera including *Aspergillus*, *Penicillium* and *Fusarium* are known to produce Mycotoxins which are highly toxic compounds capable of causing bodily injury if consumed. Colonies of mould species which produce mycotoxins can produce large amounts of toxin under appropriate conditions

The mycotoxins from these moulds fall into groups including Aflatoxin (4 subgroups), Ochratoxin (3 subgroups), Patulin and Fusarium Toxins. The health effects documented in association with the consumption of these toxins includes death, organ damage, damage to the immune system and increased sensitivity to bacterial endotoxin. Some mycotoxins such as Aflatoxin B1, are known and aggressive carcinogens.

Consumption of product infected with colonies of mycotoxin producing species is likely to result in these health effects occurring in the individual. A number of famous cases through history have resulted in significant numbers of deaths in humans, farm animals and birds.

Species of mould from *Aspergillus*, *Penicillium* and *Fusarium* genera are widely distributed in the environment so the growth of mould on a product intended for consumption should not be considered as low risk....think twice before cutting the mould off a block of cheese! ❄



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PhD candidate finds potential alternative to milk pasteurisation –

The potential would be an industry changer!



A PhD candidate at Australia's Deakin University has found a way to preserve milk for more than six weeks while also increasing its nutritional value.

Sri Balaji Ponraj found that shooting microscopic plasma bubbles through milk could be an alternative to pasteurisation, the traditional preservation method used for over 150 years.

Ponraj, alongside Institute for Frontier Materials researchers Dr Jane Dai and Dr Julie Sharp, believed that this

non-thermal method is "less aggressive" than pasteurisation, but still prevents bacteria growing as fast. This extends the shelf life of milk for a much longer period of time while also maintaining more of its nutritional value.

"We use a needle to send tiny gas bubbles through the milk, which can then be converted into plasma that provides an environmentally friendly, non-thermal approach to decontamination," he said. "Using this method, the shelf life of milk can be pushed out to six weeks minimum, which could absolutely change the landscape of the bovine dairy industry."

While research is still yet to be done using human participants, Ponraj said the method could have the potential to help the supply of human breast milk. Hospital wards and nurseries could stockpile milk without fearing it would spoil, and expressed milk – rich in important nutrients – could retain its nutritional benefits.

Ponraj recently celebrated his graduation from Deakin among 850 other students from the School of Medicine, Arts and Education, Business and Law, and Health across three ceremonies at Geelong's Waterfront campus.

Deakin University Vice-Chancellor Professor Jane den Hollander praised the graduands who strive to innovate, such as Ponraj.

"Ideas, knowledge and know-how are the critical currency for success in the 21st century, and discoveries like the one Sri Balaji Ponraj has already made show just what a difference we can make when we combine ideas, technology and drive," Hollander said. ❁

Credit: What's New in Food Technology & Manufacturing.



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FACT



This product is food safe

The HACCP International certification and endorsement process supports organisations achieving food safety excellence in non-food products, material, consumables and services that are commonly used in the food industry. HACCP International's Certification is particularly aimed at those organisations that are required to supply 'food safe', 'compliant' or 'approved' products and services to their food safety conscious customers.

Such products or services are usually those that have incidental food contact or might significantly impact food safety in their application. Food safety schemes, particularly the leading ones which are GFSI endorsed, require food businesses to subject many such products to an auditable 'due diligence' process and the HACCP International certification is designed to meet this. This independent assessment and verification of fitness for purpose offers assurance to the buyer or user that food safety protocols and processes will not be compromised in using such a product or service correctly, that such a product is 'fit for purpose' and that it makes a contribution to food safety in its application.

Certified products have been rigorously evaluated by HACCP International's food technologists and, in their expert estimation, are manufactured and designed to meet all the appropriate food safety standards. In performing the assessment, they look for 'world's best' in terms of food safety features and characteristics. The food technologists undertaking these reviews, as well as being highly qualified, also have extensive industry and manufacturing experience. Only products that are assessed as meeting the criteria can carry the mark. Quite often, organisations are required to make modifications to the product, design, delivery, literature or recommendations in order to comply. This process is therefore particularly useful for products that are designed for multiple industrial applications.

There are 10 key components reviewed in this process and certified products need to demonstrate their conformance in all the relevant facets. The ten key components are:

- 1** *Materials and specifications*
- 2** *Toxicity*
- 3** *Contamination risks*
- 4** *Ease of cleaning*
- 5** *Operating instructions*
- 6** *Consequences of error*
- 7** *Batch and process controls*
- 8** *Claims*
- 9** *Packaging and labelling*
- 10** *Contribution to food safety*

In addition to these, service providers are also assessed, through an audit process, in terms of:

- HACCP and food safety awareness
- Food Safety Training
- Documentation and reporting
- On site service delivery
- Standard Operating Procedures

HACCP International is accredited by JAS-ANZ as a conformity assessment body. JAS-ANZ is a member of The International Accreditation Forum (IAF). HACCP International operates an accredited product certification scheme, titled "Food Safety Assurance", as well as other product certification schemes.

The companies listed on page 26 carry a range of excellent food safe products or services certified and endorsed by HACCP International. For more details, please visit www.haccp-international.com or email info@haccp-international.com. The contact numbers for our regional offices can be found on page 3 of this bulletin. ❄

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HACCP INTERNATIONAL CERTIFIED SUPPLIERS

CATERING AND FOOD SERVICE EQUIPMENT AND UTENSILS

CHEF INOX (I)
HOSHIZAKI (I)
KEEPLASTICS AB (I)
LANCER CORPORATION
SIX SIMPLE MACHINES
S.P.M. DRINK SYSTEMS S.r.l. (I)

CLEANING EQUIPMENT

CARLISLE CLEANING EQUIPMENT (I)
CHAMPION MACHINERY HK LTD (I)
GLOBAL CHAMPION (Shanghai) LTD (I)
GOLDSTEIN ESWOOD COMMERCIAL OATES
SOAKTECH

CLEANING CHEMICALS, KITCHEN MATERIALS AND SANITATION PRODUCTS

3M (I)
AERIS ENVIRONMENTAL (I)
BAXX (I)
BIOZONE SCIENTIFIC (I)
BUNZL
CHAMPION CHEMICALS LTD
CLOROX (I)
CONCEPT LABORATORIES
DEB GROUP (I)
EDCO (EDGAR EDMONDSON)
ESSITY PROFESSIONAL HYGIENE
NORTH AMERICA LLC
KIMBERLY-CLARK PROFESSIONAL (I)
KURARAY KURAFLEX
OATES
PREMIUM PRODUCT SOLUTIONS (I)

CLEANING & MAINTENANCE SERVICES TO THE FOOD INDUSTRY

ACE FILTERS INTERNATIONAL
AERIS HYGIENE SERVICES (I)
CHALLENGER CLEANING SERVICES
INITIAL HYGIENE
INTEGRATED PREMISES SERVICES
ISS HYGIENE SERVICES
LOTUS FILTERS

CLOTHING, DISPOSABLE GLOVES AND PROTECTIVE WEAR

ABURNET
KIMBERLY-CLARK PROFESSIONAL (I)
LIVINGSTONE INTERNATIONAL
PARAMOUNT SAFETY PRODUCTS
PELGAR INTERNATIONAL
PRO PAC PACKAGING
RCR INTERNATIONAL
ULTRA HEALTH MEDICAL

FACILITY FIXTURES, FLOORING AND FIT OUT

ALTRO SAFETY FLOORING & WALLING (I)
AM TECHNOLOGY - AIRLITE (I)
ARGELITH BODENKERAMIK (I)
ASSA ABLOY ENTRANCE SYSTEMS
BEST CRETE (M) SDN BHD (I)
BLUCHER (I)
BLUE SCOPE STEEL (I)
CARONA GROUP
CEMKRETE/MFRP ENGINEERING (I)
DEFLECTA CRETE SEALS
DYSON AIRBLADE (I)
ELECTROLUX PROFESSIONAL (I)
ELPRESS (I)
ESTOP FLOORING SYSTEMS
FLOWCRETE (I)
GENERAL MAT COMPANY &
IDENTITY MATTERS
GIF ACTIVEVENT (I)
HALTON (I)
HANECO
MANTOVA

FACILITY FIXTURES, FLOORING AND FIT OUT CONTINUED

LABELS - FOOD GRADE

MAGNETS

MANUFACTURING EQUIPMENT COMPONENTS & CONSUMABLES

PEST CONTROL EQUIPMENT AND MATERIALS

PEST CONTROL SERVICES

REFRIGERATION, GOVERNORS, EQUIPMENT AND DATA SYSTEMS

STORAGE EQUIPMENT & PACKING MATERIAL

THERMOMETERS, PH METERS & DATA LOGGERS

TRACEABILITY

NUPLEX
ROXSET
S & G INDONESIA (I)
SIKA (I)
SILIKAL (I)
STONHARD (I)
THORN LIGHTING
UCRETE-BASF (I)
UNIVERSAL FOOD SERVICE DESIGN
VIACOR (I)
YOUNGSAN (I)
YUE PO ENGINEERING (I)
ZUMTOBEL

ABACUS INDUSTRIES
LABEL POWER
W W WEDDERBURN

AURORA PROCESS SOLUTIONS
INDUSTRIAL MAGNETICS
MAGNATTACK GLOBAL (I)

BIOCOTE (I)
CRC INDUSTRIES
ITW POLYMERS & FLUIDS
LANOTEC
SICK
SMC PNEUMATICS
WURTH

ANTICMEX
BAITSAFE
BASF (I)
BAYER (I)
BELL LABORATORIES INC (I)
ECOLAB
LODI GROUP (I)
PELGAR
PEST FREE AUSTRALIA (I)
RENTOKIL INITIAL SUPPLIES (I)
STARKEYS PRODUCTS (I)
SUMITOMO (I)
SYNGENTA (I)
WEEPA PRODUCTS

AMALGAMATED PEST CONTROL
CPM PEST & HYGIENE SERVICES
ECOLAB
FLICK ANTICIMEX
HICARE
ORIGIN EXTERMINATORS
RENTOKIL
SCIENTIFIC PEST MANAGEMENT
STAR PEST CONTROL
WG GENERA PACIFIC (FIJI)

AERIS HYGIENE SERVICES (I)
CAREL (I)
DANFOSS (I)
E-CUBE SOLUTIONS
MISA (I)

NETPAK
RCR INTERNATIONAL
SCHUETZ

3M
TESTO (I)
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