

# International Food & Meat Topics

Volume 31 Number 5 (2020)

Improving the global safety and quality of food & meat

## LIMS AND HACCP

Food safety continues to drive integration

## ALLERGENS

Safe handling of all ingredients is essential

## FOOD WASTE

A closer look at the shelf-life of individual ingredients

## PRIMARY PROCESSING

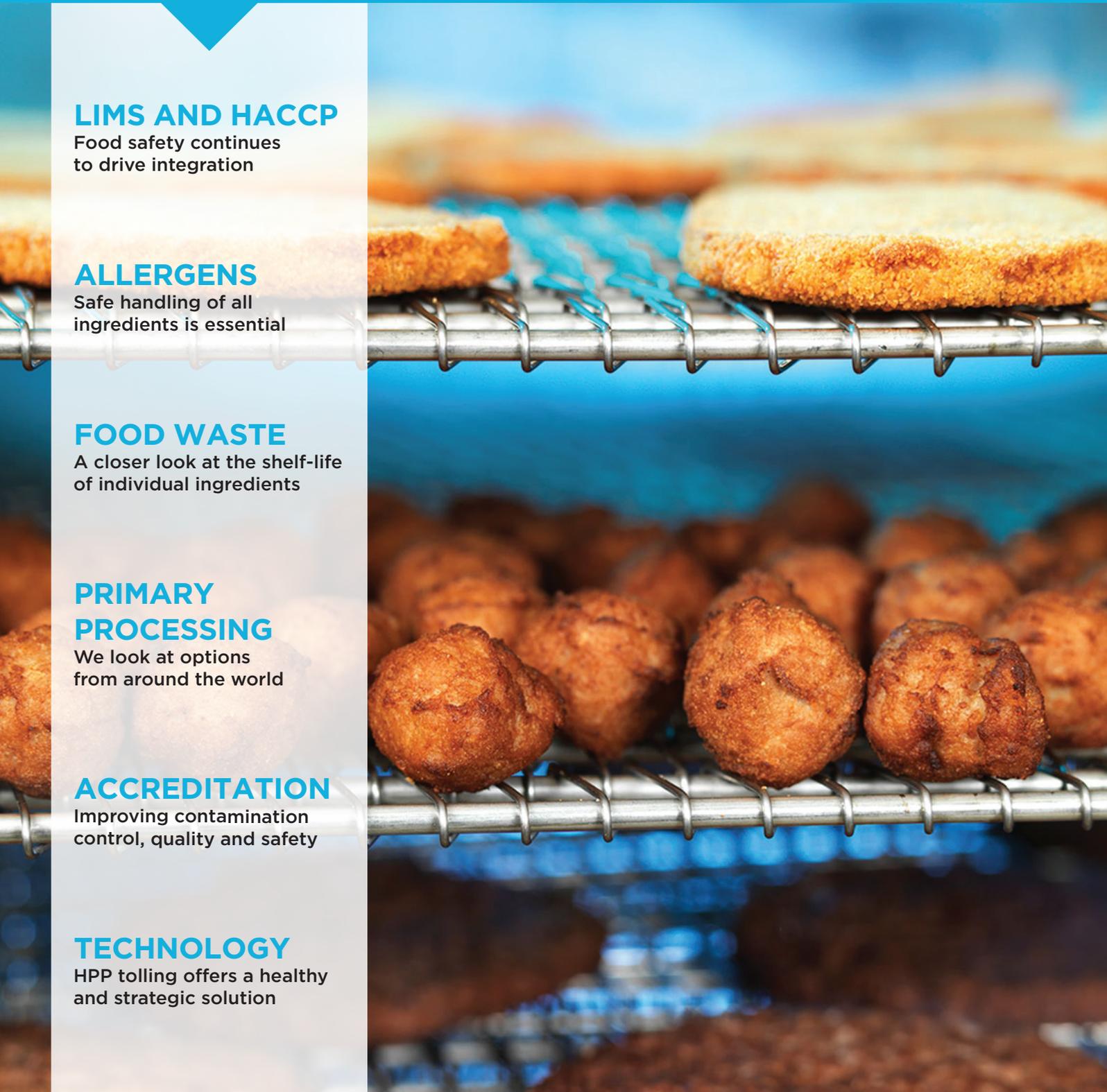
We look at options from around the world

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**PUBLISHED BY**  
Positive Action Publications Ltd

**PUBLISHER & EDITOR**  
NIGEL HORROX  
[neh@positiveaction.co.uk](mailto:neh@positiveaction.co.uk)

**MARKETING TEAM**  
CLAIRE FUSSEY  
[claire@positiveaction.co.uk](mailto:claire@positiveaction.co.uk)  
COLIN FOSTER  
[cf@positiveaction.co.uk](mailto:cf@positiveaction.co.uk)

ALISON BURDASS  
[ab@positiveaction.co.uk](mailto:ab@positiveaction.co.uk)  
STEPH WEIGHTMAN  
[steph@positiveaction.co.uk](mailto:steph@positiveaction.co.uk)

**PRODUCTION**  
SARAH DOVE  
[sarah@amneh.co.uk](mailto:sarah@amneh.co.uk)  
DOMONIC HEBBLEWHITE  
[dom@amneh.co.uk](mailto:dom@amneh.co.uk)

**DESIGN & DIGITAL**  
MATTHEW BAKER  
[bacca@amneh.co.uk](mailto:bacca@amneh.co.uk)

**SUBSCRIPTIONS**  
SALLY WALKER  
[sw@positiveaction.co.uk](mailto:sw@positiveaction.co.uk)

**ACCOUNTS**  
ANNE SMITH  
[accounts@positiveaction.co.uk](mailto:accounts@positiveaction.co.uk)

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International Food & Meat Topics (ISSN 2398-9017) is published six times a year (February, April, June, August, October, December) by Positive Action Publications Ltd and distributed in the USA by UKP Worldwide, 3390 Rand Road, South Plainfield, NJ 07080. Periodicals postage paid at Rahway, NJ and at additional mailing offices. Postmaster: Send address changes to International Food & Meat Topics, Positive Action Publications, c/o 3390 Rand Road, South Plainfield NJ 07080.

# foodforthought

**H**ave you ever stopped and thought about who is responsible for food poisoning?

Is it the farmer or grower where the original contamination may have occurred, or is it the processor who acquired that product and then processed it?

Should the liability be placed at the stage in the food chain that allowed the food poisoning bacterium to multiply up to significant disease-causing levels in the foodstuff?

Or should the allocation of blame be on the basis of the law of contract that states a product should be 'fit for purpose'?

One has to be careful when allocating blame because there is a third tier that has to be considered and that is the consumer.

Many food poisoning outbreaks have their origins in the mishandling of food in the home but these are outside the reach of legal redress in many countries.

In England a parent is immune from prosecution if they accidentally kill their own children via food poisoning, even if they have played a significant role, such

as temperature abuse, washing salad ingredients or fruit in a sink after washing raw poultry, or storing cheesecake immediately under raw meat in a refrigerator.

Interestingly, if they fed someone in their own home as part of a business, for example a lodger or paying guest, they could well be legally at fault.

In the future, one thing is certain and that is the concept of liability is going to increase and proven liabilities are going to become more expensive.

One could actually see a post-Covid-19 scenario of governments increasing charges in certain areas to recoup some of their massive costs incurred during the pandemic.

Such a scenario could involve outbreaks of food poisoning as in many cases liability could land at a corporate door.

So, looking to the future, we need to be on our guard for governments seeking to recoup some of their Covid-19 costs from our industry by hidden routes.

They will see us as fair game because, relatively speaking, the food sector was unscathed during the pandemic. ■

## Cover Picture:

Enhanced food safety  
(Photo courtesy of JBT)



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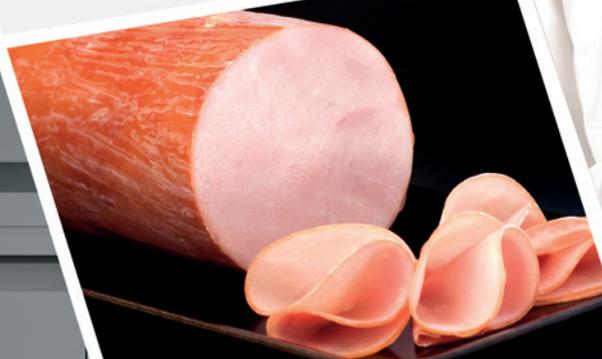


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SHARON WILSON  
[sharon@positiveaction.co.uk](mailto:sharon@positiveaction.co.uk)

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# worldfocus

An executive summary of key international issues

## UK

### Cross channel delays

The UK government's plans to revive 'Operation Brock', a traffic management system from the no-deal Brexit plan, is a major concern for meat and dairy exporters. In order to cope with cross channel delays, the system will allow thousands of lorries to park up on the motorways in Kent if there are tailbacks at the border. Cream and dairy exports are of particular concern as their shelf-life rarely exceeds 10 days. Similarly, fresh meat producers claim that it is vital that their products are prioritised to avoid food going out of date whilst in transit. Currently only seafood and day-old chicks will be prioritised in the queues.

## Armenia

### Improving food safety

The European Union, under its EU4Business initiative, has funded a project to help to improve food safety in Armenia. The initiative is being implemented by the Armenian International Trade Centre and sets the mandatory introduction and use of HACCP systems for all food producers in the country. Advancing food safety is crucial for the country's economic growth and adopting the best international practices will enable companies to produce safer, more reliable and competitive food products. This will ensure better prospects for Armenian food producers and allow greater flexibility when targeting the international market.

## USA

### Farm to table traceability

The US Food and Drug Administration (FDA) has proposed a new rule to establish a list of foods that require additional traceability records, beyond the current regulations, by manufacturers, processors, packers and holders. A draft of the Food Traceability List has identified that cheeses, shell eggs, nut butter, leafy greens, herbs, fruits, vegetables and crustaceans will be part of the new rule. The aim is to be able to track the foods at every stage of the supply chain in order to rapidly identify recipients of these foods to prevent foodborne illness outbreaks. The FDA also hopes the proposed rule will encourage the use of more digital traceability systems in the future.

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# Food safety concerns drive LIMS and HACCP integration

Food safety continues to drive the US FDA, and equivalent international bodies, to tighten oversight. Food manufacturers should therefore plan to put the integrity of their HACCP and QC testing regimes at the heart of their business, using LIMS as the binding ingredient to drive food safety and quality.

by **Tim Daniels,**  
**Marketing Manager,**  
**Autoscribe Informatics.**  
[www.autoscribeinformatics.com](http://www.autoscribeinformatics.com)

Food safety continues to be in the news following public outcry about the safety of certain foods. This is not new, as over the years there have been many food safety scandals brought to light. Contamination can occur at all stages of the supply chain and include physical, biological and chemical contamination.

Three well documented recent examples include:

## ● Blue Bell ice cream:

This product was recalled after five people became sick, three of whom died. Listeria infection was confirmed in the ice cream and traced back to the processing plant. Operations were halted, a root cause analysis undertaken, and the plant was deep cleaned, with some equipment requiring replacement.

The shutdown forced employee layoffs, and were severe enough to threaten the future of the company. Outside investment was accepted and a loan taken out for the business.

In 2020 Blue Bell Creameries was fined \$19.35M, the largest ever paid in a food safety case, after pleading guilty to the outbreak. A hold-and-test procedure now stops ice cream shipping before tests are complete.

## ● Peter Pan peanut butter:

Salmonella was found in the peanut butter causing illness in over 400 people across 43 US states. A fine of \$11.2M was paid after a guilty plea in 2016. The root cause was eventually traced to lack of enforcement of hygiene at the plant in Georgia.

## ● Cadbury chocolate:

Salmonella was found in product in 2006 causing a large product recall costing £20M. A leaking pipe in the plant was thought to be the most likely cause. In 2008 Cadbury was fined £1M for breaching safety laws over thresholds for salmonella. It now has a hold-and-test procedure in place to provide food safety assurance.

Contamination can invariably be traced back to weak QC control regimes. The learning point from these examples is that to eliminate risk food manufacturers need to closely monitor raw, intermediate and final products throughout the supply chain and manufacturing process and provide their QC staff with the technical competence, authority, and management support to enforce food safety standards.

## A proficient QC laboratory

The best food testing laboratories follow ISO17025 procedures to ensure accurate testing to provide data that can be relied upon. Without effective data manufacturers risk compromised product quality and regulatory non-compliance.

A Laboratory Information Management System (LIMS) enables food manufacturers to meet regulatory requirements and ensure consumer confidence in their products. Apart from managing sampling and test data, creating certificates of analysis, and providing essential management information, a LIMS provides a framework for enforcing and confirming good laboratory and manufacturing practice.

The latest version of ISO17025 (ISO17025:2017) puts more emphasis on a risk-based approach to laboratory management and an increased focus on the laboratory information management systems in use. The FDA has also issued a notice that by February 2022 food testing, in certain circumstances, must be conducted in compliance with ISO 17025.

This means that food QC laboratories will need to implement processes to achieve and maintain compliance with the standard, confirming the competence, impartiality and consistent operation of the laboratory. Food manufacturers therefore have a renewed



**Matrix Gemini LIMS Environmental module drives food safety.**

incentive to put QC labs at the heart of their food business, giving them the resources to enforce a safety-first culture.

Matrix Gemini LIMS is built to comply with ISO 17025. Key elements include traceability of data, automated capture of results from instruments, validation of results, instrument and calibration maintenance management, and staff competency. Functionality to help organisations achieve ISO17025 accreditation are part of the LIMS which also simplifies data management and data reporting.

## Two halves to food testing

There are two components to food safety testing. As you would expect food QC laboratories should be testing samples from the raw materials, intermediate and finished goods both within the manufacturing plant and in the supply chain. Ensuring a safe product is obviously the key function of such a laboratory. Each batch of product can have a certificate of analysis providing assurance as to its quality and safety. In addition, it must be possible to track the constituent ingredients of a batch.

However, ensuring the cleanliness of the manufacturing plant is also an essential element of food safety. Swabs and samples are typically taken from throughout the plant to monitor potential contamination.

The well-established Hazard Analysis and Critical Control Points (HACCP) principles codify a risk-based methodology to identify, evaluate and address all risks associated with food safety.

*Continued on page 8*

Continued from page 7

HACCP consists of seven steps:

● **Conduct a hazard analysis:**

Ensure food safety risks are thoroughly assessed using current and previous data.

● **Determine the critical control points (CCPs):**

Log each CCP into LIMS with enough detail to locate it in future (diagram, photograph etc).

● **Establish critical limits:**

Set the test specifications to be performed for each CCP and the analytical limits in LIMS.

● **Establish monitoring procedures:**

Define the sampling schedules of the CCPs in the LIMS.

● **Establish corrective actions:**

Establish robust corrective and preventative action (CAPA) procedures to ensure traceability.

● **Establish record-keeping and documentation procedures:**

Using a LIMS all data, user interaction, instrument calibration and test results are kept secure in case later inspection is needed.

● **Establish verification procedures:**

A LIMS ensures repeatable procedures for each CCP which should be regularly reviewed and improved..

The Environmental module within Autoscribe's Matrix Gemini LIMS is designed specifically to support HACCP. The HACCP

control points can be defined on an outline plan of the manufacturing plant. Pre-defined sample tests along with their limits and their sampling frequency are also defined. A list of CCPs is produced as required enabling the technician to collect the samples from the correct locations and at the correct time for analysis. Analytical results are mapped back onto the plan of the manufacturing plant. These may be graphically compared to previous results from the same CCP to quickly identify trends. Out of specification results can be logged into the integrated Corrective Action Preventive Action (CAPA) management system for further investigation.

Across several large sites food manufacturers can generate thousands of data points per day from HACCP sampling. Using LIMS to manage that data links the field sampling and laboratory results and puts all the data in one place, enabling instant recall of data months or even years later.

**Using LIMS to demonstrate compliance**

Results from the quality control (QC) samples and environmental (HACCP) monitoring can be associated with the final product so that investigations can track back through the data to find the root cause of

any issues identified. The process of trending results from QC and HACCP testing is designed to warn personnel of concerns before they become critical.

If limits are breached then manufacturing lines need to be stopped for deep cleaning, or product recalls are needed. These actions are far more costly to the business in terms of lost revenue and brand reputation, than the cost of implementing an effective HACCP protocol supported by the implementation of a LIMS.

Matrix Gemini LIMS is designed to enable food manufacturers to meet the compliance requirements of ISO17025 and support HACCP testing, providing traceability from individual batches of raw materials all the way through to the finished product. A LIMS offers laboratories an integrated workflow, automated procedures, and electronic record-keeping, making the whole process more efficient and productive.

Food testing laboratories that adopt a LIMS for ISO17025 will be one step ahead of the upcoming mandate by the FDA to ensure rigorous record keeping and effective management to ensure food safety.

Global food safety concerns continue to drive manufacturing quality oversight. Food manufacturers must therefore put the integrity of their HACCP and QC testing regimes at the heart of their business plans. A LIMS is the essential ingredient that drives food safety and quality. ■

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# Safe handling of allergen-containing ingredients in food processing

Food allergies affect an estimated 250 million consumers worldwide with more than 17 million in Europe alone. It is estimated that approximately 3% of adults and 6% of children have a food allergy. Although most food allergies cause relatively mild and minor symptoms, some can cause severe reactions and may even be life-threatening. Therefore, when a food safety issue occurs due to mishandling of allergen-containing ingredients, the entire food processing industry suffers.

by **Christine Hilbert,**  
**Marketing Technical Writer,**  
**Hygiena.**  
[www.hygiena.com](http://www.hygiena.com)

Today, major allergens include wheat (gluten), crustacean, shellfish, eggs, fish, peanuts, milk, tree nuts and soybeans (United States 'Big 8'), plus celery, mustard, sesame seeds, sulphur dioxide/sulphites, lupin, and mollusks (European list), for a total of 14 important groups of allergens. Even though the US and the EU have provided guidance documents for food allergen labelling, undeclared antigens continue to be a serious problem.

## Implementation of new process steps

This has forced food companies to implement new process steps to eliminate allergen cross-contact during manufacturing. Every attempt must be made to visibly identify allergens and isolate them at every step of the process, from raw ingredients and equipment to other foods housed and/or processed in the same facility.

For one major allergen, gluten, detection is even more complex. Gluten is a complex mixture of hundreds of related but distinct proteins, mainly prolamins and glutenins, and can be found in wheat, barley, rye, some rare varieties of oats and their crossbred varieties. It is mainly the prolamins (gliadin in wheat), when digested into peptides,

that trigger gluten sensitivity immune reactions, including coeliac disease.

The strongest immune response is to the prolamins alpha2-gliadin fragment, referred to as the 33-mer (recognised by the G12 antibody). This fragment is highly resistant to breakdown during digestion, making it a useful analytical marker for gluten in food products.

Since the only effective treatment for coeliac disease today is a gluten-free diet, this poses challenges to the food industry, as gluten is commonly found in many food products and additives. Plus, gluten-free products can have detectable levels of gluten due to cross-contamination during milling, storage, and/or production.

To complicate matters, gluten detection is challenging because of the diversity of food matrices, protein levels or modifications, and the vast number of immunogenic sequences with differential potential immunogenicity. Therefore, it is essential to have accurate, rapid test methods for detection of gluten in all types of foods.

Historically, ELISA was the recommended method for gluten detection in food and many commercial test kits are available. However, test kits give variable results depending on the selection of antibodies (specificity differences), extraction methods, and materials for assay calibration. ELISAs can also be costly and time-consuming.

Lateral flow devices can offer similar results, but again depend on antibody specificity for detection of specific gluten antigens. While many antibodies have been developed, only a few have made it into commercial tests.

One antibody, the Skerritt antibody, was raised against wheat gliadin and recognises high molecular weight glutenin and omega-gliadins, so it can work for detection of gluten in some processed foods. However, quantitation is based on omega-gliadin levels, which differ among various cereals.

A second antibody, R5, was raised against rye, but shows cross-



reactivity to wheat gliadin. It has poor affinity to the alpha-gliadin 33-mer, the most immunodominant toxic peptide for coeliac patients. Also, when used in the commercial ELISA, it overestimates the level of gluten in barley.

The best antibody option is the G12 antibody, which recognises the alpha-gliadin 33-mer of gluten, the fragment that triggers a strong autoimmune response in coeliac patients. It recognises a distinct amino acid sequence in wheat and detects similar peptides found in barley, rye, and some varieties of oats. It does not cross-react with soy, maize, or rice, making it suitable for measuring gluten in products containing these ingredients.

Ideally, commercial gluten detection kits should utilise the G12 antibody plus contain all the necessary reagents/components for testing food and food surfaces for the presence of gluten. Results should be obtained easily and quickly, so either processing can be quickly halted for cleaning or product can be released as 'gluten-free'.

One such kit is GlutenTox Pro, a quick test for precise gluten detection. It can detect down to 5ppm of gluten in wheat, barley, rye and some rare oat varieties within 20 minutes, far below regulatory levels.

Provided as a 'lab in a box', it is designed with everything needed to conduct testing and is AOAC PTM certified for multiple food matrices and environmental surfaces.

For other allergens, high-sensitivity

and quick and reliable detection are essential too. One commercial product family that meets these requirements is AlerTox Sticks which can detect allergens in raw materials, final products and on working surfaces. AlerTox Sticks provide accurate results in 10 minutes with no need for special equipment. Detection levels range from 1-20ppm, depending on the allergen. When combined with AllerSnap, food manufacturers can feel confident that cleaning has removed residual protein, including potential allergens.

## Responsibility of food manufacturers

Other kits must be tested to ensure they meet stringent food manufacturer allergen testing requirements, including low detection levels and no cross-reactivity to non-allergens. In the meantime, food manufacturers must be held responsible for ensuring their products are clearly labelled and free from allergens as claimed on the food labels.

It is vital that they use the most sensitive, specific immunochemical test systems available today – in the case of gluten, tests should be based on G12 antibody detection – in the case of other allergens, sensitivity and specificity, combined with ease of use, are essential. ■

References are available  
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## Number 4

# FOCUSING on reducing food waste

by Linda Everis, principal research officer at Campden BRI. [www.campdenbri.co.uk](http://www.campdenbri.co.uk)

The Food and Agriculture Organisation (FAO) of the United Nations estimates that if food waste was a country, it would be the third-highest emitter of greenhouse gases after the US and China. Alarmed? With tonnes of food wasted in the UK each year, you are right to be. Food manufacturers tolerate roughly 5% waste within their food processes under normal production, but often look for ways to reduce it. Making a product using ingredients that are a day or two old (instead of discarding them) is one way that manufacturers can attempt to reduce their overall food waste. This is common practice, assuming that the ingredients are used within their shelf-life and it is considered in the life of the product in which they are incorporated.

Being open to using older ingredients effectively extends their life, which provides greater flexibility and scope to make use of them before they are discarded.

On paper, this sounds like a win-win scenario: food waste is reduced while manufacturers have more time to use their ingredients before they are deemed unacceptable.

As food manufacturers consider incorporating one- or two-day-old ingredients into their products to reduce food waste, food safety must, of course, remain a priority.

This was recently highlighted by the Foods Standards Agency when, upon announcing its research priorities, it was made clear that reducing the impact of foodborne pathogens was one of its focuses.

So, for a product made with several ingredients, what impact does the ingredient age have on the final product's shelf-life? Our microbiologists at Campden BRI used coleslaw to find out.

### Coleslaw: the model product

For products like coleslaw, it is easy to think of them as their own entity, one that is not dependent on the sum of its counterparts – but, of course, it is. A number of ingredients are brought together to create the final product, which then has a single shelf-life attributed to it.

Each of these ingredients may be at a different stage of its own life. You would assume ingredients at the start of their life would create a final product with a longer shelf-life (due to a lower microbial loading than ingredients later in their life), but is this the case in practice?

We selected coleslaw because it contains three ingredients – raw onion, carrot and cabbage – with potentially high levels of microflora

that could increase over time during storage.

### Ingredient age and coleslaw shelf-life

Three batches of coleslaw were made with ingredients of varying age (including fresh, one day old or two days old). They were then stored in a chilled environment and assessed over a 16-day period.

These were sampled at specific intervals to determine whether the microbial count had exceeded an unacceptable amount.

Guidance produced by the Health Protection Agency (HPA) – now part of Public Health England – stated that, for coleslaw, a total aerobic count and level of  $>10^7$  cfu/g is unacceptable. In this context, 'unacceptable' means the product might appear spoiled, so it may not be suitable for consumption or sale. So, once exceeded, this was the level that would deem the end of the coleslaws' shelf-life.

### What did we find?

Our results show just how much the shelf-life of coleslaw will vary depending on the age of the ingredients used to prepare it; a difference of days. As you will see from Fig. 1, coleslaw made with two-day-old ingredients reached an unacceptable level of microorganisms (and therefore the end of its shelf-life) in just nine days. The coleslaw made with one-day-old ingredients reached the same level after 10 days, while the coleslaw containing fresh ingredients lasted an extra two days – its shelf-life ending after a total of 12 days.

Also worth noting was the initial microbial load of the two-day-old

coleslaw at day zero: at least one log higher than the other two recipes. This will have influenced the shorter time to reach unacceptable microbial levels.

Although it cannot be confirmed without a study like this, similar results may arise in other products. In fact, the impact of using older ingredients could be even greater.



### What does this mean for the industry?

Food manufacturers assign their final product's shelf-life with the individual ingredients in mind, so the final product should never contain ingredients that spoil during that product's life. Increasing the life of ingredients is one way in which food waste could be reduced – but it does have drawbacks, which need to be carefully considered. Trials would need to be carried out to show that a product remains acceptable with the same shelf-life, or indeed if the use of older ingredients would require a shorter shelf-life for a final product.

Overall, the results of this research have shown that ingredient age can have a significant effect on the achievable shelf-life of a final product and, therefore, should be considered in shelf-life trials. As this research has provided some light on just how quickly a product can reach an unacceptable level of microorganisms when made with

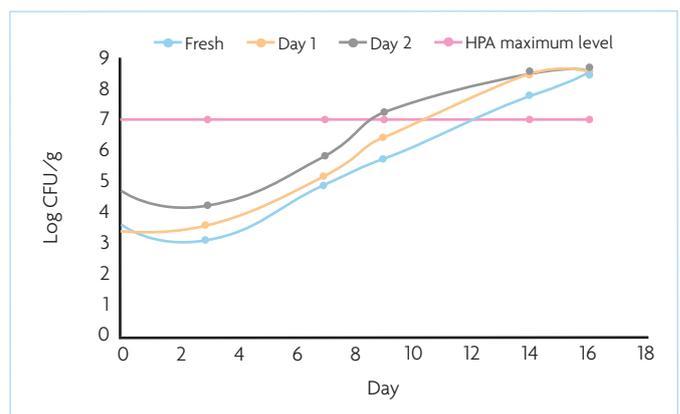
ingredients of different age, we hope that this insight will provide scope for food manufacturers to further reduce food waste in the future.

Of course, each product behaves differently, so if you are looking to test what your final product's shelf-life would be when made with ingredients of varying ages, then this is something that the team at Campden BRI can help you with.

We have conducted similar shelf-life research on other products which has allowed us to better predict the microbial levels of these products as they age, right up until the point of consumption. This, in turn, allows us to put together appropriate shelf-life protocols.

Campden BRI's recently updated shelf-life determination guidance, that is backed by expert advice and practical shelf-life assessment, has been aligned with new EU regulation and recommendations for setting a shelf-life. The new guidance, which has been extended beyond chilled foods to include ambient stored foods, is now available. ■

**Fig. 1. The increase in microbial load of three batches of coleslaw containing ingredients of varying ages, including the point that they breach the HPA maximum level of  $10^7$  cfu/g.**



## From farm to fork – the importance of animal identification in food

Animal identification and traceability have become all the more important for consumers, manufacturers and government laboratories. In the event of a crisis, being able to respond promptly and effectively will set businesses apart from their competition. From farm to fork, achieving traceability and conducting animal species testing is crucial for the quality control of products.

This is particularly true when it comes to detecting potential contamination in processed and ready meals, in food that has been prepared according to religious dietary requirements (pork-free food/halal) or in vegetarian/vegan products.

Biotecon Diagnostics recently launched its foodproof Animal Detection 1 LyoKit, which gives peace of mind when it comes to ruling out contamination. It is precise, highly sensitive and rapid in its determination of porcine, bovine and equine DNA (horse, donkey, and zebra species) in one multiplex assay and in less than three hours.

It has been successfully tested on some of the most complex food matrices, including gelatine products (jelly, powder), muscle meat, ready meals (lasagne), snack foods and confectionary. The kit guarantees

100% convenience, 100% security, 100% exclusivity.

The key benefits of the foodproof Animal Detection 1 LyoKit include:

- Fast: <3 hours to result, less hands-on time with the ready-to-use lyophilised master mix.
- Sensitivity: High overall sensitivity of 0.001% of detection limit, even in highly complex matrices, such as gelatine.
- Differentiation: Allows the identification of porcine, bovine, horse, donkey, and zebra species in one test.
- Works hand-in-hand with the foodproof StarPrep Five Kit – the quickest and easiest method on the market for extracting animal DNA.

The entire workflow takes place in a single tube, without laborious

columns, minimising handling steps and cross-contamination.

In today's day and age, authenticity and transparency are what

consumers gravitate most towards. Biotecon Diagnostics'

accredited and validated products present an opportunity for food companies to stand out as safe and quality producers.

By actively taking the right measures, such producers are addressing the diverse needs of customers and ultimately winning their brand loyalty as a result.

[bc-diagnostics.com](http://bc-diagnostics.com)



## Rapid Listeria species detection method

Hygiena, a global leader in food safety, has introduced InSite Listeria, a new easy-to-use all-in-one environmental test for Listeria species, which has been certified by AOAC RI.

The new InSite Listeria test was certified as an AOAC RI Performance Tested Method<sup>SM</sup> (certification number O61802). The certification verifies that the test detects low levels of Listeria species on stainless steel, ceramic and plastic surfaces.

Additional testing by Hygiena

scientists showed that the new InSite Listeria could more specifically detect presumed positive listeria, excluding more non-listeria species than previous tests. This specificity reduces the need for follow-up testing, further reducing the risks of extended product hold times.

Each new InSite Listeria device contains liquid media pre-measured with antibiotics, growth enhancers, and colour-changing compounds specific to Listeria spp. Within 48 hours, the test changes colour in the presence of Listeria species. The test is used for environmental

## Mycotoxin platform to support testing for top six in grain

PerkinElmer Inc, a global leader committed to innovating for a healthier world, has launched its AuroFlow AQ Mycotoxin Platform.

This new solution includes strip test versions for Total Aflatoxin, Deoxynivalenol (DON), Fumonisin, Ochratoxin A, Zearalenone and T-2/HT-2. Laboratory professionals, technicians and farmers can utilise this platform for first-round screening of corn and wheat for key, regulated mycotoxin compounds with convenience, speed and accuracy.

The expanded offering builds on PerkinElmer's existing AuroFlow AQ Afla strip test (for B1, B2, G1, G2) and leverages the PerkinElmer QuickSTAR Horizon strip reader. Results are delivered in six minutes or less, with detection levels as low as 2ppb, depending on the mycotoxin being detected.

The company's AuroFlow AQ mycotoxin kits use a single-step, water-based extraction method with lateral flow testing at room temperature. This enables safer and easier sampling and removes the need for incubators and centrifuges during analysis. The handheld reader is battery operated and rugged for portable testing.

Once results are viewed on the reader's menu-driven, colour

touchscreen, the information is stored for future access and archiving, creating clear and accurate audit trails.

The new kits are part of PerkinElmer's comprehensive portfolio of solutions for grain toxin testing workflows which span from screening tools to confirmatory analyses with instruments such as the QSight 400 Series Triple Quad Mass Spectrometer. They also complement the company's overall food safety and quality testing offerings which include instruments, software, testing kits, reagents and services for a variety of food matrixes.

"Mycotoxins are a very prevalent issue for the grain industry, with multiple forms often being seen in single samples," Greg Sears, vice president and general manager, Food, PerkinElmer, told International Food & Meat Topics.

"With the 2020 harvest, it is essential that food safety professionals have innovative testing options to help ensure the safety of corn and wheat entering the global food chain. Our mycotoxin solutions help them detect and fight these unwanted and highly regulated contaminants from the grain elevator to the laboratory."

[perkinelmer.com](http://perkinelmer.com)

monitoring in food processing facilities, food preparation environments and food retailers after cleaning. Screening out negative samples quickly and easily provides a cost-effective way to increase surveillance, monitor hazards and control risks.

"Food safety professionals have been looking for more convenient, cost-effective ways to detect listeria, and we are excited about being able to fill that gap with InSite Listeria," Brandon Katz, research and development manager at Hygiena, told International Food & Meat Topics.

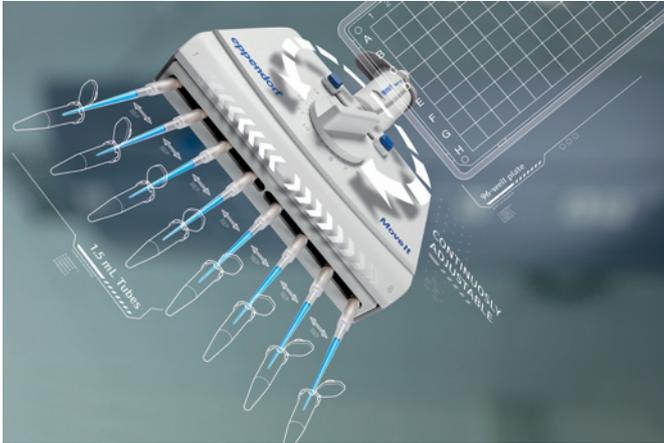
"The improved specificity of this new test will also make detecting the possible presence of listeria a much simpler process."

The new InSite Listeria testing method is self-enclosed and does not require complex laboratory

equipment, or additional reagents, reducing sample cross-contamination risks. The new InSite Listeria arrives as government regulators worldwide make monitoring and controlling listeria a priority.

[hygiena.com](http://hygiena.com)





**With Move It, Eppendorf AG have introduced the market entry for adjustable spacing pipettes, which they have redefined from scratch according to their own premium standards. They have responded to customer requests for an efficient and safe solution for synchronous pipetting of a series of samples between different vessel formats, such as between tubes and plates. The operating time compared to the use of single-channel pipettes is thus significantly reduced. Move It is unique as it offers this solution without any tubing connections between cone and piston-cylinder system. This achievement offers outstanding advantages in terms of performance: fewer moving, often fragile parts increase precision and durability. Autoclavability is also enabled, which additionally increases user and sample safety.**

[eppendorf.com/move-it](http://eppendorf.com/move-it)

## Simplified and lower price gut health test

Carbiotix has launched a new competitive gut health test within its OneGut second generation diagnostic platform. The new 'Basic' test, which will be sold at a lower price, follows the launch of the company's 'Standard' test in February 2020 and now provides an even more cost effective option for the long-term monitoring of gut health.

The launch of the Basic test reinforces Carbiotix's market position as a leading provider of white label consumer gut health tests for food and beverage companies, as well as providers of health and wellness services.

While the Carbiotix Standard gut health test is based on a Next Generation Sequencing (NGS) analysis, the Basic test is based on a Polymerase Chain Reaction (PCR) analysis. This allows the price of the test to be cut by 50%, while still offering the test in triplicate and thus providing a much more reliable test than other tests on the market today.

The PCR test also provides more useful data, allowing users to monitor over time the actual presence of key Short Chain Fatty

Acids (SCFAs), a key gut health metric to assess the real impact of an intervention such as a probiotic or prebiotic.

[carbiotix.com](http://carbiotix.com)

## White paper on validation of LIMS

Autoscribe Informatics, a leading global laboratory informatics provider, has released a new white paper on the validation of Laboratory Information Management Systems (LIMS). The white paper discusses what LIMS validation is and the steps involved, the responsibilities of the customer and supplier, how GAMP5 affects LIMS validation, and the deliverables you can expect from a LIMS validation project.

LIMS solutions are widely used by companies subject to regulation by the FDA and equivalent international bodies. To be suitable for use in regulated industries the LIMS must be shown to fulfil its intended purpose and work in the way it is designed to work. While it is the responsibility of companies themselves to prove the system has

## Remote auditing on the menu during site restrictions

BRCGS will now allow remote audits of food and beverage organisations facing continued site restrictions due to the Covid-19 pandemic.

Organisations will now be able to take advantage of remote auditing technology when being audited by certification bodies such as Lloyd's Register, following a feasibility assessment.

The announcement covers sites due an audit, an existing certificate extension, or with a certificate that expired during 2020.

Covering a number of BRCGS's certification programmes, including START!, packaging, storage and distribution, consumer products and gluten free, the movement has been introduced following the wide scale impact of the pandemic on the food and beverage industry.

Auditing plays a vital role in food safety standards, with on-site assessments historically constituting an integral part of BRCGS certification. The recent travel restrictions across the UK have led to widespread impact on the availability of such services, resulting in growing concerns around increasing food safety risks if compliance schedules are disrupted.

The move towards remote auditing has been put into action to help mitigate the impact of access and

movement restrictions stemming from Covid-19. The changes will enable continued certification despite the pandemic and to provide customers with supplier assurance.

Remote audits can take place where off-site activities are included in the scope, such as head office audits, off-site storage and field rigs. They can also be used for amendments and extensions to scope, for example where there are seasonal products or changes to a product range.

Lloyd's Register, the independent global assurance specialists and verified auditor of BRCGS programmes, has welcomed the changes.

"Many organisations during the Covid-19 pandemic have had to halt or postpone their auditing schedules, which could ultimately increase risk to their business and their customers," Kimberly Carey Coffin, Global Technical Director, Supply Chain Assurance, told International Food & Meat Topics. "However, now remote auditing is being accepted companies will be able to demonstrate through independent verification that they are continuing to meet BRCGS Food Safety Standards."

[lr.org](http://lr.org)

been validated to the required level, Autoscribe has over 30 years' experience in building and implementing LIMS for regulated organisations.

The white paper distils that knowledge into an easy to follow reference that can serve as a foundation for LIMS administrators and regulatory compliance managers on how to approach LIMS validation. It can help them understand the steps involved including creation of a user requirement specification, the development of a functional specification, the various stages of qualification testing, and production of a final summary report.

"As well as adhering to the many standards, such as FDA 21 part 11, ISO/IEC 17025, good laboratory practice (GLP) and good automated manufacturing practice (GAMP), regulated companies must satisfy

themselves that their information management systems perform as expected and are fit for purpose," Simon Wood, Product Manager at Autoscribe Informatics, told International Food & Meat Topics.

"This system validation white paper gives LIMS practitioners a tried and trusted framework to work from to help ensure the system has been implemented and tested with the necessary rigor to be sure this is so."

The paper is available to download from the company's website.

[autoscribeinformatics.com](http://autoscribeinformatics.com)

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# Understanding food safety throughout the poultry processing chain

Outbreaks of salmonellosis and campylobacteriosis are threatening consumer health and can lead to 'juicy' headlines in newspapers, affecting the image of poultry processing. Therefore, all stakeholders in the poultry processing industry have good ethic and economic reasons to maximise poultry-related food safety.

by Willem Heemskerck,  
Poultry Processing Researcher,  
Meyn Food Processing  
Technology BV, The Netherlands.  
[www.meyn.com](http://www.meyn.com)

This article looks at food safety and the prevention of contamination throughout the entire poultry processing chain.

Food safety is defined as: 'the assurance that a food will not cause harm to the consumer when it is prepared and/or consumed according to its intended use.'

A food may harm the consumer if it contains any sort of contaminant, defined as: 'any biological, chemical or physical agent not intentionally added to food, as a result of production, manufacture, processing, preparation, transport or storing of such food.'

These definitions underline that food safety is a chain-event, it is very complex and requires knowledge especially of microbiological food safety (root cause analysis) and



requires a systematic approach to prevent problems. In the poultry industry, a chain of stakeholders like farmers, processors, transporters and retailers have a shared interest and responsibility to improve food safety to protect consumer health.

The basic question is: why and when do people get ill, and what can stakeholders do to prevent this?

## Microbiological food safety in general

Bacteria are small organisms of 1-4 micron large, able to multiply themselves by splitting. The multiplication time depends on the circumstances (temperature, oxygen, water, acidity, nutrients).

Circumstances may be perfect for one type but deadly for another type. Under ideal circumstances it takes only 20 minutes to split into two cells. So, the bacterial count can increase from one to two after 20

minutes, to four after 40 minutes and to eight after 60 minutes. If the count doubles every 20 minutes, the count will reach 680,000,000,000 within 12 hours. Luckily, the growth of bacteria is reduced and stopped by a lack of food, and a surplus of waste.

Thousands of different bacterial types exist, all with their own characteristics. Salmonella and campylobacter are the most dangerous bacterial species for the poultry industry. Due to the body temperature of a chicken (around 42°C) and the circumstances in the intestines, a chicken is an ideal host for these bacteria. Luckily, consumers are aware that raw chicken products may contain pathogenic bacteria.

Proper cooking of poultry products will always kill all these illness-causing (pathogenic) bacteria. However, in case of poor cooking or poor kitchen hygiene, some bacteria will still be present at the moment of consumption.

In order to cause illness, the bacteria need to pass two more barriers and the vulnerability varies per bacterial species.

## Barrier 1: The human stomach

The acidity of the stomach will kill the vast majority of the bacteria. However, if a consumer uses medicine to neutralise excess stomach acids (antacids), the stomach becomes less acid and therefore less bacteria are killed. So, such antacids may improve the survival rate of bacteria.

If the kill rate in the stomach is, for example, 99.9%, an attack by 100 bacterial cells will not cause problems, while an attack by 100,000 bacterial cells may be successful, as statistically some will survive the stomach. If the kill rate in the stomach is reduced from 99.9% to 90% (by antacids), even a low dose of 100 bacteria cells may cause problems.

## Barrier 2: The human defence system

Bacteria which survive the stomach will start to multiply in the intestines. The bacteria may penetrate the blood vessels, where they will be attacked by the antibacterial defence system; the white blood cells in the blood. If the white blood cells lose the first battle, illness occurs.

### ● Salmonella:

After 6-48 hours (incubation time) the consumer suffers from salmonella-related illness called salmonellosis, leading to abdominal cramps, diarrhoea and vomiting for several days.

### ● Campylobacter:

After 72 hours (incubation time) the symptoms of campylobacteriosis are even worse than the symptoms of salmonellosis. In some cases, campylobacteriosis may lead to long term neural damage (Guillain Barré syndrome).

The body will continue the fight until the war is won. One of the weapons of the body (fever) is not very effective because salmonella



and campylobacter like fever-temperatures of 38-42°C.

Obviously, this defence system is more effective in young healthy people than in vulnerable people.

The infectious dose is the number of bacteria which may cause a disease. Obviously, this infectious dose depends on the sensitivity of the bacterial species and the condition of the two barriers.

Despite the fact that bacterial problems can only happen after improper cooking or food handling in the kitchen, the whole production chain has an interest in improving and securing food safety.

Microbial food safety starts with keeping bacterial numbers low, avoiding spread, maximising removal/rinsing and avoiding growth in all stages of the chain:

- The farm.
- The processing plant.
- Transport and storage.
- The consumer.

### Microbiological food safety at the farm

#### ● Contamination of a flock:

Day-old chicks are generally salmonella and campylobacter-negative. A flock can become infected by, for example, a mouse (or even just a fly) entering the house.

Salmonella and campylobacter do not make the birds ill, but they easily multiply in the intestines of chickens; they are excreted with the faeces and subsequently contaminate other birds.

In the case of campylobacter, the % of infected birds may stay 0% for four weeks. Once a bird is infected, campylobacter easily grows and spreads, leading to a sudden rise to 100% within a week.

#### ● Feed withdrawal time:

At the day of slaughter, feed must be withdrawn at the correct time: if the feed withdrawal time is less than eight hours the intestines may still be full at slaughter, increasing the risk of biological contamination.

If the time is more than 12 hours, their intestines become weaker, also increasing the risk of biological contamination. A too long feed withdrawal time also reduces animal welfare and yield.

#### ● Biosecurity:

Biosecurity is the definition for the group of preventive measures taken to lower or eliminate the risk on the import of animal diseases within a company and the spread of those diseases to other enterprises.

Typical measures are, for example, the ban on transport of poultry in case of avian influenza, placing footbaths at the entrance of a poultry house, requirement to wash hands and to wear clean clothes and boots on the farm.

### Microbiological food safety at the processing plant

Healthy birds may harbour huge numbers of bacteria in their intestines, on their skin and between the feathers. During primary processing the feathers and the intestines are removed, and after chill the temperature of the skin is generally too low to allow growth. So, food safety is mainly related to primary processing.

#### ● Immersion scalding:

Most bacteria will die during scalding, depending on scald temperature, scald time configuration and the rinsing effect of the scald. After scalding the bacterial counts on the carcasses show a 90-99% reduction in Enterobacteriaceae (like E. coli and Salmonella species) and campylobacter on the carcasses.

Until about 20 years ago, immersion scalders were equipped with systems to inject air into the scald water to improve the immersion of the birds.

These air-injected scalders had some drawbacks (cleanability, construction, energy consumption), which were solved by the introduction of the jet stream scald.

#### ● Jet stream scalding:

Years ago, Meyn introduced the jet stream scald as the successor of the so-called 'Jacuzzi' scald.

#### ● Pasteurisation:

A benefit of jet stream scalding, compared to air-injected scalding, is the fact that the scald can pasteurise itself, simply by increasing the temperature to pasteurisation levels.

#### ● No foam:

Foam is a perfect environment for bacterial growth, so this should be avoided. Unlike air-injected scalders, jet stream scalders do not produce any foam.

#### ● Cleanability:

A jet stream scald uses much less heat, so it does not require a double plate heat exchanger, which is much easier to clean. The air duct system of an air-injected scald is the hardest part to clean; a jet stream scald does not require an air duct system.

#### ● Other benefits:

Water saving, reduced energy consumption and less emission of scald smell.

Food safety in the evisceration department is determined by three related activities: vent cutting, opening and evisceration. During these activities it is vital that

intestines are not damaged and that the entire intestinal packs of all birds are removed.

To secure food safety, Meyn released a new generation of the vent cutter, opener and eviscerator.

#### ● Improved vent cutter:

Vent cutting is the first step of evisceration; the purpose is to cut the vent loose from the abdominal skin, and hang it over the back of the carcass, without damaging the intestines.

For that purpose, the Meyn Vent Cutter 3.0 was released, a new generation which is equipped with a patented inner bushing system, reducing intestinal damage to an absolute minimum (<3% damage (internal + external damage)). The drill unit is effectively cleaned from the inside, after each bird.

The vent cutter reaches an efficiency of >99% properly cut, >98% correctly hanging over the back, which is the best in the market and provides an excellent basis for the next steps in evisceration.

#### ● Improved opener:

The second step of evisceration is the newly launched Meyn Opener 3.0 which contains a patented cutting mechanism to ensure a consistent and exact cut in a very wide weight range. The opener reaches a level of >99.5% correctly opened birds, thanks to the accuracy of the vent cutter.

Damage to the intestines is reduced to <0.5%, which is excellent. Real-life measurements confirm that (visual) contamination is reduced by at least 50%, compared to the previous equipment range.

#### ● Improved eviscerator

Since 1992, the Maestro has reached a level of >99% correct evisceration, which means that >99% of the carcasses are empty which saves (unhygienic) rework. Furthermore, little intestines remain in the eviscerator itself, also improving hygiene.

Virtually all intestinal packs are presented with the corresponding

carcase for veterinary inspection. However, a bottle neck remained the complexity of giblets harvesting.

Recently, the successor of this eviscerator, the Maestro Plus was launched, reaching the same level of evisceration efficiency but giblets harvesting has improved considerably, as the eviscerated packs are rehung into grippers in which the packs are presented for veterinary inspection.

Subsequently, the edible giblets (liver, heart and gizzard) are automatically harvested with a high efficiency.

#### ● Improved washing cabinets:

After the slaughter department the bacteria are still loosely attached to the skin, so their count can be reduced by rinsing.

Rinsing stages have been optimised by using the Undine technology.

A technology that involves mixing water with air for a high efficiency of rinsing.

### Microbiological food safety during transport and storage

At refrigeration temperatures (<3°C) salmonella and campylobacter do not grow, so numbers remain stable or decrease. It is crucial that such low temperatures are maintained by the transporter, the retailer, and the consumer, until the product is fully cooked.

### Conclusion

Food safety issues are the joint responsibility of all stakeholders in the chain, from farm to fork. It is crucial that all understand how contamination works, realise their interest, are aware of their responsibility and act accordingly.

Leading poultry processing equipment manufacturers like Meyn have recognised their responsibility by improving existing equipment and developing new equipment to keep the consumers and the poultry business as healthy as possible. ■





## Thigh deboner with cut-up line integration and auto transfer-loader

Foodmate's OPTiX thigh deboner, which uses X-ray technology to detect the kneecap by measuring the thigh bone length to ensure the highest possible yield and cartilage-free meat, is now available with easier cut-up line integration with the Auto Transfer-Loader module (ATL).

[foodmate.nl](http://foodmate.nl)

The integration with the cut-up system enables more efficient thigh deboning. The Auto Transfer-Loader module (ATL) is available with new and existing machines.

It offers labour savings and is

equipped to accommodate a variety of bird sizes.

The machine makes a perfect anatomical drum and thigh cut because the leg is always set to the correct height when it is presented to the blade.

The OPTiX thigh deboner accommodates all bird sizes and adjusts in real time for each leg on the line. It can operate at speeds of up to 12,000 thighs per hour depending on the line configuration and bird size. The machine produces cartilage-free meat with minimal bone content, which results in minimal trimming while maintaining a hand-cut appearance.

## First-of-its-kind low energy processing line for juices

Tetra Pak has launched a new, first-of-its-kind low-energy processing line for juice, nectar and still drinks (JNSD) to take beverage processing to a new level of efficiency.

It innovatively uses a unique combination of pasteurisation, filtration and UV light technology to treat beverages in two separate streams, which are aseptically blended together into the final beverage.

[tetrapak.com](http://tetrapak.com)

Instead of pasteurising the whole volume of the product, the new production line separates out water and pasteurises only the concentrate. Water is treated

separately with filtration and UV light which requires a lot less energy.

In the new JNSD line customers reduce energy consumption up to 67% and water consumption used for cleaning-in-place, sterilisation and product change-over is cut up to 50%.

"We realised that we needed to rethink JNSD processing and find a more sustainable solution, that at the same time still provides a high level of food safety and quality assurance for our customers," Maria Norlin, Subcategory Manager JNSD & Other Beverages, Tetra Pak, told International Food & Meat Topics.

"The launch of our new low-energy JNSD processing line, 'Best Practice Line for JNSD with Aseptic Blending',

## A popular contributor to safer working practices

For those responsible for the nation's abattoirs, Brexit had already brought a major focus on automation as a way to address the issue of labour shortages. With the new realities of the working environment as we continue to navigate our way through the effects of Covid-19, automation has taken on an even greater significance as plant operators find ways to achieve safe working practices.

[interfoodtechnology.com](http://interfoodtechnology.com)

Commercial pressures have already seen a number of smaller abattoirs close, leading to an enquiry by the All-Party Group for Animal Welfare (APGAW) which recognises the important role played by small abattoirs. Finding ways in which abattoirs, both large and small, can develop is therefore fundamental in ensuring they remain a crucial part of the farm-to-fork supply chain.

As machines do not need to be socially distant, identifying methods through which labour-intensive processes can be automated is very much a focus in this development. In abattoirs, this is

leading to the increasing use of machines in areas such as meat cutting and deboning, with automated bandsaws becoming an increasingly popular option.

The Astech PW (precision weight) bandsaw is available in the UK and Eire from Interfood. As a continuous automatic bandsaw with integrated weight control, it requires fewer operatives than some other bandsaw methods and certainly considerably fewer than required in manual cutting and deboning.

Its scanning system generates precision weight slices to pre-determined weight/thickness parameters.

The Astech PW can accommodate frozen meat and fish or fresh bone-in products. Its continuous operation means there is no need to stop the saw to load the product, providing efficiencies in operation, while its hygienic design ensures easy cleaning.

High quality cuts are generated through precise speed adjustments and, as a fully enclosed machine with a user-friendly interface with versatile programming, safe and ease of operation are ensured.



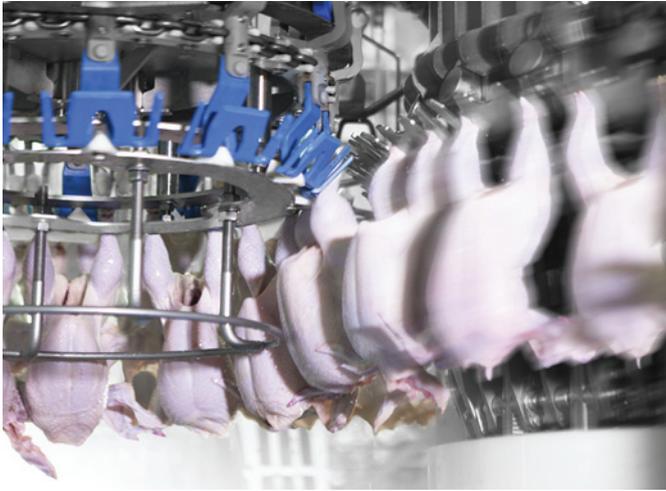
illustrates how we are innovating with traditional processing methods in pursuit of more sustainable and efficient solutions.

"Our decision to split the existing JNSD line into two separate processing streams for treatment allows us to offer our customers processing options that can help them achieve their climate goals, and enables the industry to contribute towards global sustainability efforts.

"After many years of low growth,

we see new opportunities for our customers on the horizon, as people increasingly search for ways to lead a healthier lifestyle, and this trend has accelerated during the spread of Covid-19. We hope this new production line can help customers capture the growth opportunities in a more cost-efficient way.

In October 2019, the presentation of the new production concept was recognised with the IFU 2019 Innovation Award at the Juice Summit.



LineLink transfer units hand over products and product data.

## Primary processing: a proven solution at an all-time high speed

Marel have introduced the world's first integrated 15,000 broiler per hour primary processing line. Dealing with such high speed, there is no other way than to have paramount reliability; if not, every minute of malfunctioning means 250 lost chickens.

[marel.com/15000](http://marel.com/15000)

All systems of Marel's 15,000 bph solution are set for this all-time high processing speed. From live bird handling with ATLAS and stunning with CAS SmoothFlow, via evisceration and chilling, up to the distribution line, every process step solidly handles this processing pace.

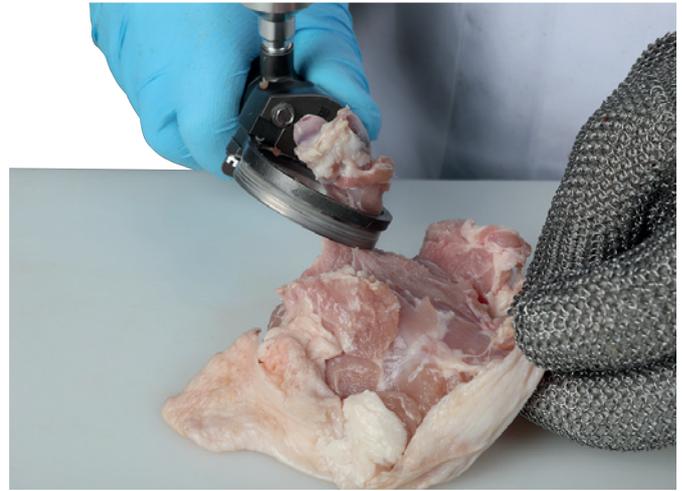
Marel Innova software supervises all fast processes plant-wide and

gives real-time insight and control. The newly developed LineLink transfer units underline the reliability of Marel's 15,000 bph solution. They seamlessly hand over products from one shackle type to another.

In addition, they also transfer all information collected on each product.

Another key factor regarding reliability is Active Tension Control (ATC); this system, unique to Marel, keeps the powerful forces of the overhead conveyor lines under control.

For 15,000 bph processors, an all-time high processing speed is not a goal in itself. Achieving lowest production costs, it is of utmost importance that highest quality and efficiency remain uncompromised.



The trimmer blade adapts perfectly to the curve of the bone.

## Improved comfort, precision and efficiency for higher yields

Bettcher Industries Inc's range of user-friendly and powerful tools ensures optimised processes that result in a significant increase in yields.

[bettcher.com](http://bettcher.com)

Consumers prefer to buy their product ready to eat and free of bones. Abattoirs and the meat processing industry have adjusted to this and are now deboning the increasingly popular thigh meat.

Obtaining tasty leg meat is a major challenge for the poultry industry. When removed from the bone, the meat needs to be clean, free of splinters, and look appetising. At the same time, meat production must

utilise cost-efficient processes.

The poultry industry receives ongoing support from Bettcher Industries Inc to find solutions to these challenges and the company has therefore developed their small Quantum Flex trimmers to boost optimisation and profitability in poultry processing.

The small versatile and easy-to-use Quantum Flex 620 trimmer from the latest generation of Bettcher tools is ideal for the poultry industry. It facilitates, amongst other things, the removal of tender thigh meat from the bones.

The global demand for poultry meat is increasing. Using advanced trimming tools simplifies work in the poultry processing sector and has a significant impact on yield.

These easy-to-use and lightweight tools with their ergonomic design optimise trimming and ensure high-precision results. By increasing yield, it makes poultry processing more profitable.

The company's headquarters are in Ohio, USA, while its European head office, Bettcher GmbH, is located in Dierikon, Switzerland.



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# The cube of food analysis

In order to comply with the General Food Law Regulations of the European Commission (EC), the European food industry needs a full range of analytical tools, indispensable for research, development and quality control. Whether high-throughput QA/QC laboratories in agriculture, flavor & fragrances, food & beverages or food processing and packaging, Shimadzu provides instruments and software solutions for every analytical challenge.

**Serving all food industries**  
with high-speed analysis of food and drinks ingredients and contaminants

**Complete range of analytical instrumentation**  
including chromatography, mass-spectrometry, spectroscopy and material testing

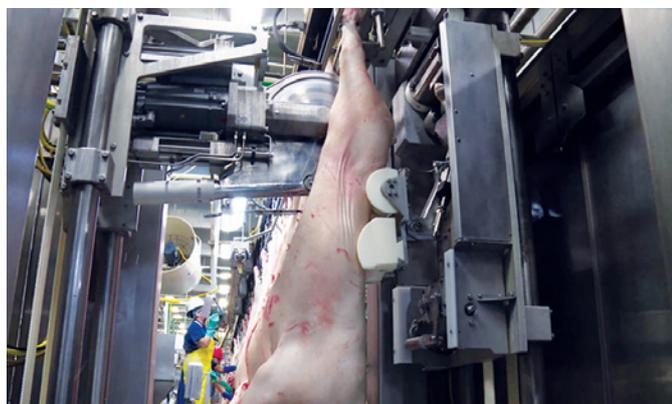
**Total support from farm to fork**  
providing tools for monitoring food safety from production to packaging

**Access to expert knowledge**  
through download of free of charge application handbook



Download now





### New generation of hog splitting and beef splitting robots

Jarvis offers a new generation in hog splitting with their model JLR900, which enables the splitting of 850 hogs per hour.

[macmeatprocessingequipment.co.uk](http://macmeatprocessingequipment.co.uk)

Features of this linear robot include:

- **Reliable:**  
Extreme uptime allows for uncompromising detail and craftsmanship in a massive construction.
- **Accurate and fast:**  
Precision and control offers a graceful, smooth operation, even at remarkable speed.
- **Hygienic:**  
Component sanitisation integration from the base up.
- **User friendly:**  
Easy operation requires minimal training.

To improve automation for beef splitting Jarvis offer the model JR50,

which enables the splitting of 175 beef/hour.

The JR50 opens the spinal cavity cleanly from tail to neck. Features of the JR150 include:

- Clean feather bones on both sides.
- Integrated saw sanitisation.



### New multi-type stunning tray with innovative features.

Bayle has developed a new multi-type stunning tray with innovative features.

[baylesa.com](http://baylesa.com)

● **Respect for animal welfare:**

In order to guarantee animal welfare and to comply with the 1099/2009 regulation, Bayle have developed a system of access doors to prevent drowning by rapidly stalling poultry in case of a chain stop.

● **Optimised cleaning:**

Thanks to a clever door system, the water-bath is fully accessible to allow deep cleaning. The access doors are mounted on electric hinges to ensure the safety of operators during the stunning stage. The water-bath also has a removable and openwork grate for easy cleaning.

● **Water-bath for all types of poultry:**

The water height in the bath can be

set from 620mm to 1350mm, allowing the passage of all types of poultry, and ensuring an effective daze.

● **Adjustment of the usable stunning area:**

In order to adjust the water-bath to different production rates, the new water-bath allows the usable stunning area to be adjusted from 1350mm to 2700mm.

By adjusting the usable stunning area according to your production rate, you ensure your poultry the ideal time to pass through the water-bath and therefore achieve the perfect daze.

● **Enhanced security:**

Their new water-bath stunner is designed with safety checks allowing the safety of operators by removing the risk of electrocution. The access doors are also secured thanks to their electric hinges, which ensure that the electrical current stops when the doors are opened.



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Professional

# Monitoring

ensuring the safe production  
of food and meat

# Measuring

The most successful food & meat producers understand the fundamental need for accurate information and control to ensure the safe production of food. It is important to use the best instruments to measure critical data upon which important decisions will be made. This page is designed to help you find the right instruments from reliable sources.

This feature appears in the October and April issues of International Food & Meat Topics.

Contact us to find out how to be listed and enjoy the benefit of being seen by at least 24,000 food & meat company managers.

## Leak detection

### Ishida Europe Ltd

Kettles Wood Drive  
Woodgate Business Park,  
Birmingham B32 3DB, UK  
Tel: +44 121 607 7700  
Fax: +44 121 607 7666  
Email: info@ishidaeurope.com  
Web: www.ishidaeurope.com

The Ishida AirScan, a world innovation for fast, reliable and non-destructive leak detection, uses laser technology to identify leaks of CO<sub>2</sub> from holes in MAP packs down to 0.25mm and at up to 180 packs per minute.



## Food safety testing

### NEOGEN

European Headquarters of Neogen Corporation, The Dairy School, Auchincruive, Ayr KA6 5HU, UK.  
Tel: +44 1292 525 625  
Email: NeogenUK@NEOGEN.com  
Web: NEOGEN.com/en-gb

Specialists in rapid, easy to use and innovative food safety testing solutions for food allergens, hygiene monitoring, pathogen detection, microbial testing, mycotoxins, speciation, seafood toxins and food genomics.



## Data loggers

### Gemini Data Loggers (Tinytag)

Scientific House, Terminus Road,  
Chichester, West Sussex PO19 8UJ, UK.  
Tel: +44 1243 813000  
Fax: +44 1243 531948  
Email: info@tinytag.info  
Web: www.tinytag.info

UK manufacturers of Tinytags: accurate, robust temperature data loggers including BSEN12830 compliant units. Includes stand alone units and Radio/LAN loggers, which collect data automatically providing remote access.



## Temperature monitoring

### Electronic Temperature Instruments Ltd

Easting Close, Worthing,  
West Sussex BN14 8HQ, UK.  
Tel: +44 1903 202151  
Fax: +44 1903 202445  
Email: sales@etiltd.com  
Web: www.etiltd.com

Specialists in the design and manufacture of temperature measuring equipment for over 30 years and winners of the Queen's Award for Enterprise for International Trade in 2017.



## Food safety testing

### 3M UK PLC

Charnwood House, 10 Bakewell Road,  
Loughborough,  
Leicestershire LE11 5RB, UK  
Tel: +44 1509 613263  
Email: emeafoodsafety@mmm.com  
Web: www.3m.co.uk/food safety

3M offers a comprehensive range of food safety solutions: convenient microbiological testing, advanced pathogen detection, allergen control, rapid hygiene management along with sample handling.



## Data logger systems

### T&D Corporation

European Sales Office, Gronauer Str. 1,  
61194 Niddatal, Germany.  
Tel: +49 6034 930 970  
Email: europe.office@tandd.de  
Web: www.tandd.com

Wireless and network connected solutions for monitoring all aspects of food preparation, transportation, storage and service. Data loggers safeguard goods and processes and ensure error-free documentation.



Please mention International Food & Meat Topics when responding to any of the companies in this Monitoring & Measuring feature



For further information on how to be included in this feature please contact  
**Claire Fussey:**

**Tel: +44 1377 241724 or  
claire@positiveaction.co.uk**

# HPP tolling: a healthy and strategic solution for all kind of products

Food safety is a big headache for a lot of companies around the world because traditional measures that have been introduced to commercialise safer products normally involve large costs and a loss of freshness and other added value properties.

by **Alejandro Blanco**,  
Sales Manager, Hiperbaric.  
[www.hiperbaric.com](http://www.hiperbaric.com)

HPP technology and tolling are a solution because both provide sustainable and healthier products.

## A choice of hundreds of companies worldwide

High-pressure processing (HPP) applies high-isostatic pressure with water at chilled or room temperature (4-25°C/40-75°F) to packaged products in seconds or minutes.

It is an instantaneous and uniform process that does not affect food covalent bonds but modifies the three-dimensional structure of proteins and polysaccharides.

This breaks the micro-organism's membrane, inactivating pathogens, while preserving nutritional and organoleptic properties of the fresh product.

In essence, HPP is synonymous of:

- **Minimally-processed products:** It keeps the original nutritional and organoleptic characteristics.

- **Longer shelf-life:** From a few days up to weeks, or even months, under refrigeration conditions, reducing the use of preservatives such as salt.

- **Guarantee of food safety:** It inactivates spoilage micro-organisms and foodborne pathogens (i.e. listeria, salmonella, vibrio or norovirus).

- **Innovation:** It can be used for product development with novel or unique attributes due to its effect on food constituents.

- **Wide variety of products:** It can be applied in traditional sectors such as juices and beverages,

avocado products (guacamole), meat (sliced deli meats, dry-cured products) or seafood to more trendy categories like ready-to-eat meals, plant-based dips (hummus), baby food or wet pet food.

- **Environmentally friendly technology:**

It uses lower energy than thermal treatments; the pressurisation fluid (water) is recycled and it is a waste-free process.

These are the reasons why hundreds of enterprises around the world have trusted in this technology to revolutionise their process no matter their size, sector or product. Furthermore, restrictions concerning the size and shape of packaging in HPP products are minimal. While it is important to maximise the filling ratio, the basic requirements are the water resistance and flexibility of the packaging, plastic materials being the best option.

## How does HPP work?

HPP is a post-packing technology, which means it is the final step in the product processing and only labelling and boxing steps are conducted after HPP.

Packaging must be made of water-resistant materials, as they will be in direct contact with water during the process, and flexible materials to withstand pressure.

As pressure is transmitted instantly and uniformly to every point of the vessel, there is no crushing of the product, however, small deformations can occur which makes flexibility a must.

The packed product needs to be placed inside special carriers – or baskets – and loaded into a special chamber where the product is submitted to pressure.

This vessel is then filled to the top with tap water at ambient pressure and then sealed by heavy steel plugs and wedges.

High-pressure water is then pumped inside the vessel through a special circuit connected to the vessel at one end to a special high-pressure pump at the other.

As more water is pumped inside



HPP toller with a Hiperbaric 525 litre unit.

the vessel over the nominal volume, the pressure is increased until the desired level is reached, normally within the range of 5,000-6,000 bar/ 72,500-87,000 psi.

Then, a reverse count will start to ensure that the product is submitted to the pressure for a time deemed to achieve the desired results in terms of bacterial reduction and shelf-life extension, based on previous laboratory tests.

Once the time expires, the machine will release pressure through a safety valve and proceed to open the vessel, which then moves to the unloading position.

When the new cycle is loaded, the previous one is unloaded and the baskets with the processed goods are ready to be discharged.

The whole cycle is automatic and basket loading and unloading can be automated in the larger Hiperbaric systems.

HPP is also an environmentally-friendly technology as the water from one batch is recycled and reused for the next one.

## A healthy and strategic solution

HPP technology has become an essential tool for companies worldwide that have invested in it or have booked a specific tolling service.

A tolling service allows the development and commercialisation

of HPP products to SMEs, entrepreneurs, start-ups, HORECA enterprises and new exporters that cannot or do not want to invest in an HPP unit now.

Thank to these services these companies can enjoy the benefits of technology and tolling.

- **No capital investment:** Instead of investing capital initially, companies can adopt the technology by paying a service fee, usually on a per-pound basis. This allows flexibility for seasonal products, and the introduction of new products and new markets.

- **More competitive retail prices:** Using facilities and processes of a toller, companies can reduce their associated production costs.

- **More economic security in a recently created business:** To reduce capital tie-up offers a lower financial risk.

- **New 'export' alternatives:** Booking HPP tolling services in the destination country limits tax and customs costs, among others.

- **Greater safety in innovation processes:**

The development of products in collaboration with a toller offers the opportunity to modify recipes and probe the consumer with affordable costs, guaranteeing food safety and a higher success rate with the launch of the final product.

Furthermore, HPP tolling customers of Hiperbaric have other interesting advantages:

*Continued on page 22*

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- **Hiperbaric Global HPP Network:** As an HPP-toller, you can join the Hiperbaric Global HPP Network. This network grants both tollers and their customers access to Hiperbaric's application team of food scientists, who can assist with food safety assessments and new product development objectives.
- **24/7 support and quick start-up:** Hiperbaric offers an after sales service and support 24 hours a day, seven days a week, helping tollers and their customers run efficiently, without any interruption of operations. Their highly specialised field technicians around the world are devoted to providing reliable support anywhere, anytime.

### Advantages of HPP units

Since its inception in 1999, Hiperbaric has designed, developed, produced and marketed its high-pressure processing units internationally. The company's intensive R&D, combined with an outstanding team of professionals, has promoted it to a leading position (more than 60% market share), with 300 machines installed worldwide. Thanks to these continuous R&D efforts by Hiperbaric, its HPP units add interesting advantages that

reduce time-outs and speed up processes, making them more reliable:

- **Versatile design:** Intensifiers (high-pressure pumps) can be installed alongside the machine or in a service corridor and also in a platform on top of the vessel. This last design reduces the footprint and facilitates its implementation in a food industrial environment.
- **Wide range of industrial machines:** From 55-525 litres, Hiperbaric's HPP machines meet the requirements of start-ups, small-medium enterprises and large corporations.
- **Labour saving and greater flexibility:** HPP units are integrated with their loading and unloading lines and systems. Hiperbaric provides further turnkey automation solutions adapted to customer needs.

- **After sales service and support worldwide 24/7:**

Highly specialised field technicians, diagnostic services and remote monitoring, after-sales portal. All are customer-oriented to satisfy requirements.

### HPP tolling

Aware of the interest that this technology arouses, especially during this challenging time of Covid-19, Hiperbaric recently held a webinar aimed at making HPP tolling known both to companies interested in providing high-pressure processing services, as well as to users who are seeking the opportunity to commercialise a wide variety of HPP products, as a preliminary step to investing in the technology.

We know this technology can be difficult to understand and to answer all technical

questions, Hiperbaric has an excellent engineering and applications team and two pilot plants (Burgos and Miami) where our PhDs do validations and new product developments.

However, a lot of people want to know about the cost of HPP technology and sometimes have doubts about the investment so we approach the HPP technology and tolling service in a free webinar to answer these questions about how HPP acts in their products, what it can provide them and what is the best way to do it.

With a hybrid presentation and round table format, the attendees not only learn about high-pressure processing (benefits for the consumer, equipment, challenges and opportunities, trends) or tolling services (advantages for companies, global HPP tolling network, case studies), but they can also ask their questions live to several HPP tollers from different regions around the world, as well as to Hiperbaric specialists.



For those interested in technology and HPP tolling, the recording of the successful Hiperbaric webinar is available via: [www.hiperbaric.com](http://www.hiperbaric.com)

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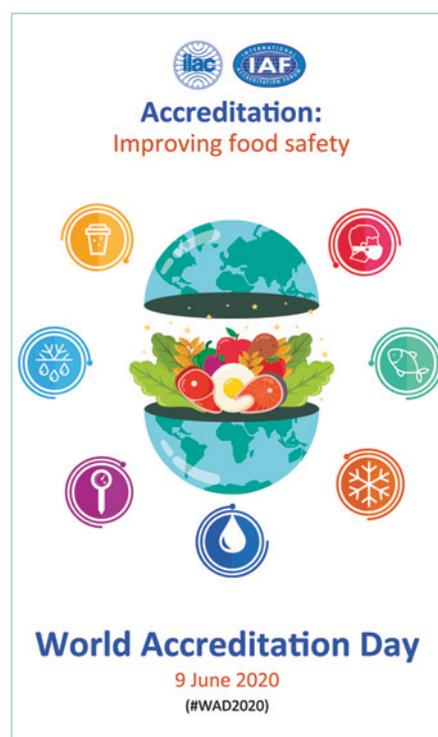
# Improving standards of food safety through accreditation

For consumers around the world, access to safe and nutritious food and water are essential requirements for maintaining health and well-being. Accredited conformity assessment plays a pivotal role in improving the contamination control, quality and safety of the world's food.

by The Food Sector  
Accreditation Team, UKAS.  
[www.ukas.com](http://www.ukas.com)

In April 2019, the World Health Organization (WHO), World Trade Organization (WTO) and Food and Agriculture Organization of the United Nations (FAO) together estimated that nearly 600 million people fall ill with foodborne diseases every year.

**Food safety was the theme of the 2020 World Accreditation Day organised by IAF and ILAC.**



Of those contracting foodborne diseases some 420,000 die prematurely, with 30% being children under five years old.

Accreditation aims to reduce the number of these incidents by driving up the safety performance of all organisations in the food chain.

UKAS accredits a range of laboratories, certification and inspection bodies, proficiency testing and reference material providers working within the food industry. From chemical and microbiological tests of food and packaging, to certification audits of feed and handling sites, to the inspection of farms and slaughterhouses, all aspects of the food supply chain from farm to fork can be accredited.

UKAS accreditation of these activities ensures that consumers, suppliers, purchasers and specifiers can have confidence in the safety of the goods and services they receive, and most importantly, be assured these products are safe for consumption.

## Facilitating international trade

In addition to being essential for both human development and nutritional security, food safety is an important part of international trade. Food production is an increasingly interwoven international process, with ingredients and products being imported and supplied to all parts of the world.

The WTO estimates that the global trade of food is now worth \$1.5 trillion a year, having expanded threefold over the last 20 years.

Accredited standards play an important role in reducing technical barriers to trade by providing proof of conformity and helping producers gain acceptance for their foods in international markets.

For example, both primal cuts and manufactured beef can now be exported from the UK to Canada as it is subject to UKAS accredited microbiological testing, which meets the standards required by Canadian authorities.

UKAS is a signatory to the International Accreditation Forum's (IAF) Multilateral Recognition Agreement (MLA). As a result, UKAS accredited certification activity is

recognised as being equivalent to national accreditation arrangements in over 90 different economies across the world. This has many benefits for both food certification bodies and their customers that work internationally.

Kiwa Agri Food is a UKAS accredited certification body, specialising in product certification for the farm, animal feed and food sectors.

Alison Spencer, Quality Manager said: "Kiwa Agri Food UK is an integral part of the worldwide Kiwa Group and we do a lot of partnership work with divisions in areas such as Europe, Australia and Turkey. Many of our international divisions also hold accreditation from their home country's accreditation body but this may be for different schemes.

"However, the 'accredited once, accepted everywhere' nature of accreditation means that with the correct agreements and training in place, these divisions can achieve certification for their clients under Kiwa Agri Food's accreditation.

"In addition to offering an expanded market access for our internationally-facing customers, this delivers economies of scale and brings us closer together as a global organisation."

## Supply chain integrity

Supply chains with the food industry are complex and coming under increasing pressure, particularly at times of crisis, such as the Covid-19 pandemic.

In addition to delivering value, accreditation helps demonstrate the integrity and robustness of food supply chains, giving purchasers confidence in the way food is both produced and delivered.

UKAS accredited certification body STS has developed its own Food Safety Standard for Food Suppliers & Distributors which is now widely recognised, particularly in the public sector supply chain.

Fiona Sinclair, Director, said: "Accredited certification provides a high level of confidence of safety in the food supply chain, that is externally and independently audited.

"For example, the STS standard, which we  
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are accredited for, features specific requirements with regard to *Listeria monocytogenes*.

This standard is followed by hundreds of food manufacturers and distributors reducing the incidence and levels of *Listeria* present in the food chain, when compared to the supply chain without these bespoke standards.”

### Recognition and customer confidence

Far from being a mere box-ticking exercise, accreditation is widely acknowledged as a robust and independent way to determine that internationally recognised standards of quality are being adhered to.

Fiona Sinclair said: “For manufacturers and other suppliers involved with the food supply chain, third party certification is designed to demonstrate compliance with global food safety standards, protecting customers and company reputation.

“The recognition of the accredited certification that we provide to our customers can deliver significant benefits for them.

“This includes new business opportunities through increased market access (as certification is often required or expected contractually to supply many organisations),

stakeholder confidence and business performance optimisation through reduced waste, complaints, recalls etc.”

Emphasising the importance of UKAS accreditation to scheme owners, Alison Spencer said: “The UKAS marque shows that we have been independently verified and are regularly checked by an impartial, world renowned accreditation body. That is why many scheme owners, such as BRCGS and AIC stipulate that audit bodies of their schemes must be UKAS accredited.”

Even where accreditation is not specified as a pre-condition of tendering for contracts, it can become a practicality of doing business in other markets, as Alison explains:

“All food sectors have different standards to work to, tailored to the specific risks of their product or channel. Ultimately these schemes are all interconnected and united in the aim of giving regulators, retailers and consumers the confidence that a food product is fit for human consumption. UKAS accreditation offers that necessary assurance.”

To help ensure this trust is maintained during the current Covid-19 situation, UKAS has been operating remote accreditation assessments since the middle of March, and has produced guidance and webinars to help all conformity assessment bodies prepare.

UKAS has also been closely working with

the IAF Working Group Task Force in production of specific guidance on remote auditing accredited food safety certification.

### Sustainable accreditation

Consumers are increasingly ethically and environmentally aware, moving sustainability up both the corporate and regulatory agenda. Accreditation has a track record of contributing towards sustainable development goals in the food industry.

UKAS has been involved in LEAF Marque assessments (Linking Environment and Farming) since 2005 and is playing a key role in the European Accreditation’s (EA) evaluation of the scheme.

This leading global assurance uses the principles of integrated farm management to recognise and encourage more sustainably farmed products.

UKAS is also working closely with developers of ethical trading schemes, including the new Ethical Trade and Responsible Sourcing standard which is being produced by BRCGS.

The United Kingdom Accreditation Service (UKAS) is the sole national accreditation body for the UK. For further information please visit: [www.ukas.com](http://www.ukas.com)

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## Influence of rearing system on broiler chickens

This Polish trial (*J. of Apd. Animal Research*, 47, En, 42 ref) was conducted in order to evaluate the effect of the rearing system and sex on live body weight, daily weight gain, carcass traits, and meat quality of broiler chickens. 60-day-old Ross 308 chickens were randomly divided into two experimental groups based on rearing system: intensive system (IS) birds reared until 42 days old, and semi-intensive system (SIS) birds reared until 56 days old. Compared with the SIS group, the IS group had higher daily weight gain, weight and yield of pectoral muscle. The SIS group had higher carcass weight and carcass yield.

In comparison with IS, SIS exhibited lower breast meat pH and higher lightness and yellowness values. The sex influence was not observed on physicochemical characteristics of chickens reared in both systems.

### Water-spraying improves breast meat from summer-transported broiler chickens

In this British trial (*Poultry Science*, 99, 1744-1849) researchers assessed whether water atomising with forced ventilation could increase freeze-thaw meat quality after slaughtering of birds.

The results indicate that 45 minutes transport followed by 15 minutes of water atomising with three-dimensional forced ventilation and 45 minutes of rest after transport can improve meat quality, which may be due to the improved welfare of broilers transported in hot summer months.

### Effect of propionic acid and fumigation with aluminium phosphide on grain corn

This Malaysian study (*Journal of Animal Science*, 22, 11-26) found that the addition of propionic acid as a preservative and fumigation material using anti-weevil (aluminium phosphide) could slow the damage process of corn.

### Soybean meal reduction in livestock diets

A Chinese paper (*Chinese Journal of Animal Nutrition*, 31, 3438-3447) reviewed the home and abroad research about the reduction of soybean meal to provide a reference for the use of nutritional regulation technology in the diets of livestock and poultry.

### Cloning and expressing genes from marine bacteria in *E. coli*

This Chinese study (*Food and Fermentation Industries*, 45, 34-39) aimed to solve the problem that glucose oxidase (GOD) from

marine bacteria has low activity. The genomic DNA of citrobacters was extracted and purified, and the target sequences was obtained by comparing against existing GOD genes.

The study introduced the marine bacteria GOD gene into *E. coli* to reveal a new host of GOD.

Recombinant GOD has cold-active enzyme properties which lays a foundation for its application in feed additives and cryogenics.

### Feed additives as alternatives to in-feed antimicrobials

In this Norwegian study (*Animals*, 10, 240) 24 alternatives to antibiotics (ATAs) and the ionophorous coccidiostat narasin were compared against a diet without any feed additives.

It is suggested that optimising combinations and use of active components can make ATAs even more useful tools in broiler rearing without the use of in-feed antimicrobials. However, studies of ATAs are required.

### In vitro growth of gut microbiota with selenium nanoparticles

In China, the influence of selenium (SE) nanoparticles was investigated on a diverse and mature broiler caecal microbiota (*Animal Nutrition*, 5, 424-431).

The effect of rooster as a biological variable strongly overpowered the effects of nano-Se in the media, resulting in moderate effects on the structure and diversity of the caecal microbial community.

However, the nanoparticles showed a significant reduction in the abundance of an emerging poultry pathogen *Enterococcus cecorum* identical operational taxonomic units,

which could be of notable interest in poultry production for targeted *E. cecorum* control without significant disturbance to the total microbial community.

### Low cholesterol and high omega-3 fatty acid through dietary manipulation

In this Indian experiment (*Animal Nutrition and Feed Technology*, 19, 37-46) it was found that in order to produce low-cholesterol eggs, which are preferred by health-conscious consumers, dietary supplements may be used without affecting the production efficiency of laying hens.

Fish oil from local fish may be effectively used for the production of n3 FA enriched egg.

### Motilin receptor gene associated with growth and carcass traits

The results of this Chinese study (*British Poultry Science*, 60, 649-658) suggest that a mutation of the motilin receptor gene (MLNR), which regulates gastrointestinal motility and gastric emptying, is strongly associated with growth related traits.

### Egg quality comparison

The analysis from this Portuguese experiment (*Poultry Science*, 99, 1768-1776) indicated that eggs from native genotypes match the quality of a commercial product in many characteristics.

In markets where eggs from local breeds are available, consumers are purchasing a high-quality product, while aiding in the expansion of local genetic resources and investing in local farms.

### Ginger extract enhances antioxidant ability and immunity of layers

This Chinese study (*Animal Nutrition*, 5, 407-409) shows that ginger extract not only improves antioxidant capacity and enhances immune function, but it also has the potential to reduce inflammatory responses in layers.

### Gradual provision of live black soldier fly larvae

This Swiss study (*Animals*, 10, 216) concluded that live *H. illucens* larvae could successfully replace soy in diets of older laying hens (in combination with local plant proteins).

These insects also had a positive effect on the feather condition of laying hens with intact beaks.

## Improving fish health

 Cermaq's iFarm five-year project is the first of its kind and will allow for an individualised fish approach to salmon farming.

By using artificial intelligence and machine learning, Cermaq will be able to identify each fish in a net pen, allowing for targeted health interventions if required and individualised health records for each individual fish.

Last December, Cermaq Norway was awarded four development licenses for iFarm, and preparation work started in January. Since then, thanks to the efforts and support of many people across Cermaq (BioSort, the developer of the technology, and ScaleAQ, who has supported the delivery of the system) the various components of iFarm are taking shape and they have been able to successfully install the system.



The project rounded a big milestone when the first smolt was transferred into the iFarm pens.

"This is a very exciting and important phase in the project; now we will see how the fish behave in the actual iFarm environment and whether our modelling and predicted outcomes for behaviour are accurate," Karl Fredrik Ottem, Cermaq's project manager for iFarm, told International Food & Meat Topics.

In iFarm, the fish are kept lower in the system using a net roof. When the fish rise to the surface to refill their airbladders, they are guided through a portal, or chamber, where a sensor can quickly scan, recognise and record data on that specific fish using recognition data based on each fish's unique markings and structure.

The iFarm project trial will run until 2025, and Cermaq recognises that they are in the very early stages of the project and that it is a very complex system which will require sophisticated interaction between farming equipment, machine vision and fish behaviour in full scale.

The knowledge and experience gained from this first stocking of fish will be used to optimise the design for the second stocking, which is planned for 2021.

[cermaq.com](http://cermaq.com)

### Phage technology reduces salmonella



A new study shows that phage technology can be a useful tool for poultry processors experiencing challenges in mitigating bacterial contamination within food products.

In ground turkey, the study showed a decrease in salmonella prevalence of 38.6% (a 17.8 point difference from the control of 46.1% and the treatment of 28.3%) when turkey parts were treated with Finalyse SAL prior to grinding.

Finalyse SAL is an antimicrobial from Arm & Hammer Animal and Food Production that uses naturally occurring phages to reduce the presence of salmonella in poultry processing.

The study compared two batches of bone-in drums from the same flock. The control batch was dipped in 500ppm peracetic acid (PAA) for 30 seconds. The treated batch was

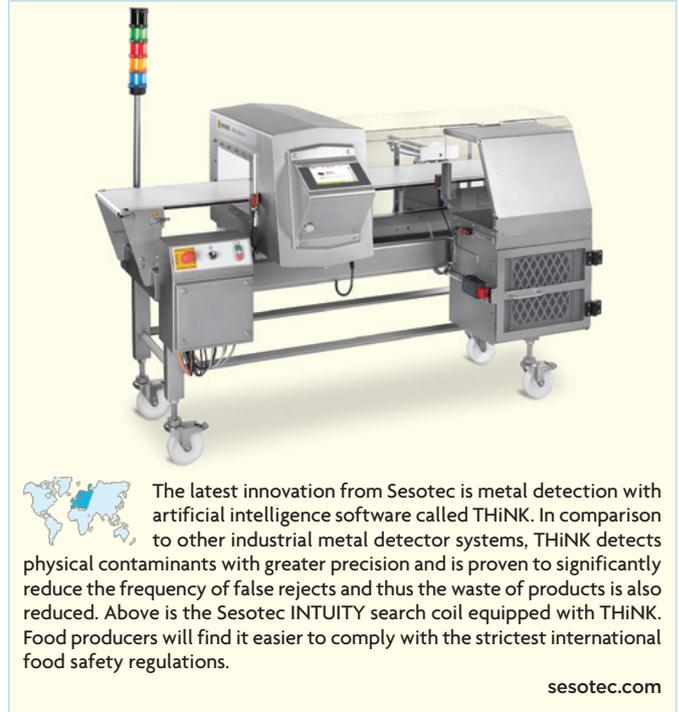
also dipped in PAA for 30 seconds followed by an application of  $10^7$  pfu/mL Finalyse SAL solution for 30 seconds.

The control and treated batches were shipped to the same grinding facility and ground separately prior to salmonella sampling and analysis.

Over a one-month period, this process was repeated for a total of 18 batches with samples collected from 10 random trays for both the control and treated groups. Test results showed 46.1% salmonella prevalence in controls. Finalyse SAL reduced the salmonella prevalence to 28.3%.

The phage technology in Finalyse SAL activates in the presence of salmonella to invade and kill the harmful bacteria. This safe, natural and biodegradable technology only activates when salmonella is present and naturally degrades without its host.

[ahfoodchain.com](http://ahfoodchain.com)



The latest innovation from Sesotec is metal detection with artificial intelligence software called THINK. In comparison to other industrial metal detector systems, THINK detects physical contaminants with greater precision and is proven to significantly reduce the frequency of false rejects and thus the waste of products is also reduced. Above is the Sesotec INTUITY search coil equipped with THINK. Food producers will find it easier to comply with the strictest international food safety regulations.

[sesotec.com](http://sesotec.com)

## Insect animal feed study



Campden BRI has begun working with a team of experts to develop insect nutrition in animal feed to move the UK's poultry production towards a sustainable future.

A grant of £250,000 from the Innovate UK Transforming Food Production programme was secured by a team involving Entec Nutrition, the University of Exeter and research partners Campden BRI.

The research will look to reduce the carbon footprint of the feed industry by investigating efficient insect production methodologies and the science behind insect nutrition in animal feed.

"We will be developing the methodology to produce insect-derived protein and oil ingredients. This will include separation, drying, milling and analysis of each product's characteristics including nutrition, shelf-life and functionality," Tiia Morsky, ingredients research team leader at Campden BRI, told International Food & Meat Topics.

As population levels rise, it is expected that poultry consumption will increase, generating a greater demand for animal feedstocks, and therefore animal-feed ingredients.

The global feed industry is energy-intensive, reliant on international imports, at risk of commodity price hikes, and associated with deforestation.

The UK needs to increase feed production resilience to mitigate these issues and to move the UK's poultry production towards a sustainable and productive future. This project will develop insect feed to lower the cost of production and environmental impact of the poultry industries and significantly support the UK's goal to reach net zero carbon target by 2050.

Dr Olivia Champion, who co-founded Entec Nutrition with University of Exeter colleague Professor Richard Titball, said: "We are thrilled to have won this Innovate UK Transforming Food Production grant with our research partners. It is really exciting for Entec Nutrition to form part of the UK's clean innovation solutions to reach net zero carbon emissions by 2050.

"The funding will allow us to explore methods for low energy production of insects to lower the cost of production and the environmental impact of the feed industry."

[campdenbri.co.uk](http://campdenbri.co.uk)

## Next step in spiral freezing



Enhanced food safety, performance and optimisation are the key technologies in the latest spiral freezer to join JBT's Frigoscandia brand. They believe their new GYROCOMPACT 70 Spiral Freezer is set to take food-focused freezing to the next level.

The new freezer has a belt width of 700mm and is more compact than any of its predecessors, yet offers up to 20% increased capacity.

Designed to be both sustainable and hygienic with a number of new streamlined features to further eliminate food traps and maximise food safety, the new freezer joins the GYROCOMPACT 700mm product line which has sold over 1,700 units worldwide. The new freezer is also iOPS-ready to enable peak optimisation. Customer feedback, combined with its pioneering of the self-stacking spiral belt, are what drive the development of the Frigoscandia brand.

"Customers continue to require increased food safety, combined with higher efficiency in uptime and capacity," Torbjörn Persson, JBT's Director of Value Stream and Global Product Line, told International Food & Meat Topics. "Of course, most industrial freezers are quite large, so the need to have food-safe freezers is really important when looking at a full food production line. One key factor is that the freezing process itself does not limit growth of bacteria on contaminated products, but only stops it momentarily. This is one reason why optimised hygienic design has always been our top

priority. Floor joints, reduced overlapping surfaces, reduced visible threads and pop rivets are just some of the innovations.

"We've also seen a clear trend for more variation in the products our customers produce, which enforces the need for flexible production lines. For example, we can now increase the capacity for chicken nuggets from around 4000kg/hr up to 4,800kg/hr."



Designed for production rates of between 1.5-5.0 tons per hour, the freezer can be utilised for existing frozen food applications, while also having benefits for plants with space constraints, as its headroom has been reduced by 600mm.

Quicker drying functions, optimised airflow, less drive forces, and savings of up to 75% in oil consumption are just some of the features JBT has introduced, with further innovations in the pipeline.

[jbt.com](http://jbt.com)

### Breakthrough detector technology



Eagle Product Inspection has introduced a new detector technology that combines the latest advancements in dual energy technology and image analysis software. The new PXT (Performance X-ray Technology) is a breakthrough inline inspection technology that captures more detailed data about the product being inspected than has previously been possible.

Eagle's RMI 400 and Eagle Pack 400 HC machines are now available with PXT, which allows the application of multiple processing algorithms to

work in parallel for every image captured. "This breakthrough technology, which has set a new industry standard for performance, improves bone and contaminant detection while simultaneously performing quality and integrity checks, leading to an overall lower cost of ownership," Simon King, General Manager for Eagle Product Inspection, told International Food & Meat Topics.

PXT provides poultry processors the ability to repeatedly detect the smallest bone fragments, down to 1mm. Lower false reject rates result in less product rework.

[eaglepi.com](http://eaglepi.com)

## BIO-RAD QUALITY CONTROL TESTING LABORATORY RECEIVES ISO 17025 ACCREDITATION

BIO-RAD

Bio-Rad has obtained ISO 17025 accreditation from the Cofrac (French Accreditation Committee) for its quality control laboratory in the manufacturing plant in Steenvoorde, France (N° 1-6642).

ISO 17025 accreditation recognises that the controls used in batch release for water and food microbiology testing performed in the laboratory are uniform, so downstream laboratories can reduce their testing and controls and still ensure food and water safety. If a laboratory is not accredited, the downstream laboratory must strictly monitor its products and services to ensure they are performing as anticipated.



"Testing requirements for food and water continue to increase, so it is critical that we deliver products under accreditation to our customers so they can have confidence in our product quality," said Jean-Michel Plancq, Quality Manager, Bio-Rad. "We are pleased that we met the requirements during [our] initial accreditation audit with little deviation from our normal protocols."

The accreditation process uses the internationally accepted ISO 17025:2017 standard for testing and calibration laboratories. Certificates of analysis that report the quality of products are accepted anywhere without the need for further testing.

As a result, the standard can streamline cooperation among manufacturers, regulatory entities, and accreditation organisations to offer customers confidence that the manufacturer provides conformity in testing via the validation of their controls by independent experts.

For more information on Bio-Rad's complete range of food safety and water testing products, please visit [bio-rad.com/foodscience](http://bio-rad.com/foodscience)

BIO-RAD

**Weltec Biopower**

Weltec Biopower has started building a biogas plant in South Korea. The plant is being set up in the province of Gyeonggi-do, some 60km north of Seoul, and will transform biogas into heat in an integrated gas boiler. As early as spring 2021, the seven megawatt plant is to go live and digest up to 93,000 tons of food waste a year, some of which will also come from local households. Since President Moon Jae-in assumed office, the government has been making concerted efforts to achieve autonomy in the power and heat sector and to significantly increase the share of renewable energies. Recently a Green New Deal was announced in order to deliver net zero carbon emission by 2050. South Korea will be the first country in East Asia to set a timeframe to end its contribution to climate change.  
[www.weltec-biopower.de](http://www.weltec-biopower.de)

**IFST**

In 2018, WRAP reported that there were 9.5 million tonnes of food waste estimated in the UK, equating to a loss of £19 billion and 25 million tonnes of greenhouse gas emissions (WRAP, 2020). When food is lost or wasted, it impacts the environment, the economy and availability of resources at a time when many people cannot access enough food to eat. In support of WRAP/IGD's Food Waste Reduction Roadmap, the Institute of Food Science & Technology (IFST) has created new food waste resources, to raise awareness and help prevent food waste. Their new Food Science Fact Sheet provides clear, concise and scientifically reliable information particularly aimed at helping consumers make informed decisions about how to reduce food waste, especially in the home.  
[www.ifst.org](http://www.ifst.org)

**GEA**

GEA has supplied integrated cooling and heating systems for the new site of the poultry processing company 2 Sisters Storteboom BV in Komorniki, Poland. 2 Sisters Storteboom and GEA have worked closely together in the planning, configuration and installation of these systems. The aim

is to significantly reduce energy consumption and CO<sub>2</sub> emissions, thus protecting the environment and saving costs. With this joint project, the two companies are continuing a partnership that began successfully in 2007 with the opening of the site in Kotowo, also in Poland. GEA has designed a ventilation system for the whole building, tailored to the specific requirements of the different rooms. In addition, the company's in-depth analysis of the heating process revealed that it could help 2 Sisters Storteboom to reduce fuel consumption and significantly increase energy efficiency through the installation of GEA heat pump technology. The system recovers waste heat from the cooling system to heat water to 55° Celsius, which is then used to wash the plant. GEA's solutions fit very well with 2 Sisters commitment to environmental protection. The cooling system uses ammonia as a natural refrigerant, which has zero global warming potential. The compressors and main units are equipped with frequency inverters to ensure the highest efficiency of the whole installation. The heat recovery system replaces the gas-based boiler heating system, thus reducing carbon dioxide emissions. In addition, it saves around €60,000 per year compared to the standard boiler, providing a return of investment in only three years.  
[www.gea.com](http://www.gea.com)

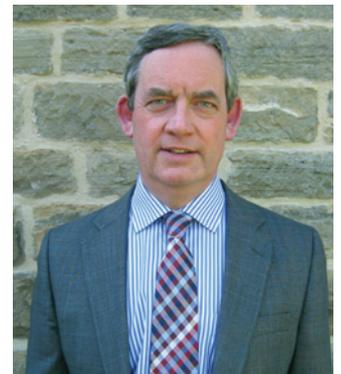
**Chr Hansen**

Chr Hansen Holding A/S has released its 2025 Strategy with the ambition to create a differentiated bioscience company to improve food and health for a sustainable future. Food cultures & enzymes and health & nutrition will be at the centre of its new strategy. During the strategy period, which runs until the end of the financial year 2024/25, the company's long-term financial ambition is to deliver mid- to high single-digit organic growth, averaged over the period. Today, more than 80% of Chr Hansen's revenue contributes to the UN's Sustainable Development Goals, and they are committed to continue to leverage the 'Power of Good Bacteria'.  
[www.chr-hansen.com](http://www.chr-hansen.com)

**Trusting non-toxic claims?**



Can the food and beverage industry ever trust 'non-toxic' claims? According to Jerry Lewis, Chief Technical Officer of Kilfrost, the food and beverage industry rightly strives to continually improve efficiency and safety as companies seek to serve growing numbers of customers. However, it is clear that some demands for greater efficiency can negatively impact on consumer safety.



The human impact of this was brought into sharp focus by deaths in Brazil at the beginning of the year, traced back to the contamination of beer with diethylene or ethylene glycol in the Backer Brewery.

This tragedy highlights the importance of inherent process safety, and the need for better clarity around the safe use of heat transfer fluids and anti-freeze.

Currently, facilities and process owners must trust claims of 'non-toxicity', while shouldering the burden of responsibility for consumer wellbeing.

Part of the issue is the classification of anti-freeze and the definition of safe processes, which varies from country to country.

The US Food and Drug Administration (FDA) has two broad categories for materials that may come into contact with food: Generally Recognised as Safe (GRAS), where chemical substances are exempt from the usual food additive tolerance limits due to their long history of safe use; and Food Safe Material, which only applies to substances which are reasonably

expected to come into contact with food, and also considers their safe threshold values for use.

Trusted accreditation is already available from NSF International, which assesses the safety of an anti-freeze formulation based on the FDA's categories.

Accreditation is given solely based on formulation components, so no ethylene glycol-based products can be included because the chemicals within them are not deemed GRAS or Food Safe Material by the FDA.

NSF Certification is the only way to ensure the inherent safety for heat transfer fluids, and those involved in food and beverage processing should look for this mark of reassurance when purchasing anti-freeze, heat transfer fluids or other materials.

Only through the exclusive use of accredited fluids can the food and beverage industries begin to truly eradicate risk, and start to trust in the phrase 'non-toxic' again.

[kilfrost.com](http://kilfrost.com)




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**Exclusive Distributors:**  
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**Interested parties can visit the Belgian plant**

[www.ph-liquid.com/\\_food\\_and\\_meat](http://www.ph-liquid.com/_food_and_meat)



Moba, a leading producer of high-quality integrated systems for the grading, packaging and processing of consumption eggs, has introduced its new extension in the Omnia grader family: the Omnia XF2. The XF2 has a new and improved infeed system and new hygienic features. With a capacity from 45,000-255,000 eggs per hour the Omnia series is now available in all capacities. The new infeed system has an open frame design which makes it easy to access during cleaning. It can be foamed and high pressure cleaned.

[moba.net](http://moba.net)

### High precision spray marination



Metalquimia have introduced their new injector Auvistick Plus 990 HP, a high-precision 4.0 spray marinating line, with up to 4,914 injection points and offering a high-density needle pattern.

The main characteristic of the new injector is its unrivalled output capacity: the 990mm belt width provides very high productivity, achieving up to 12,000 birds/hour.

The special and innovative design results in an independent needle brine injection system for an optimal multiple way injection operation, minimum dripping, optimisation of yield, and higher quality and consistency of the marinated product.

The Auvistick Plus 990 HP is designed for processing bone-in and boneless products. The injector incorporates automatic rammer control system, flexible memory effect for the needles, extended input conveyor belt and high-

performance brine pump. It operates absolutely integrated in the 4.0 Smart Automation System and it is equipped with MQC\_Data Intelligent Module.

It assures total smart sanitisation, with automatic cleaning, great simplicity of needle extraction and easy access for maintenance, cleaning, and sanitation.

[metalquimia.com](http://metalquimia.com)

### The plant-based pioneers



The 'plant-based revolution' is not just a dominant international food trend, it is also a very apt description for the development of Hydrosol.

A specialist in stabilising and texturing systems, within just a few years the company has grown to become one of the key players in the burgeoning market for plant-based alternatives. Its product portfolio has expanded enormously, and last year this expertise was combined in the newly founded Plant Based Competence Center.

Now, Hydrosol's unit for plant-based products has become an autonomous company and, Planteneers – The Plant Based Pioneers – are the experts for plant-based alternatives within the Stern-Wywiol Gruppe. This new subsidiary builds on the success of Hydrosol, and is led by Managing Director Dr Matthias Moser.

[stern-wywiol-gruppe.de](http://stern-wywiol-gruppe.de)



## 6 GAPS IN YOUR ENVIRONMENTAL TESTING PROGRAM

by Stefan Widmann, Product Manager, Romer Labs

### 5 Identification and detection of foreign bodies

#### What are foreign bodies?

Foreign bodies are among the chief sources of customer complaints concerning food products. According to the EU's RASFF (Rapid Alert System for Food and Feed), the presence of foreign bodies is the third most frequent source of complaint, preceded only by that of pathogenic microorganisms and allergens. Even in the best-managed production facilities, there is always the risk that fragments from production equipment or packaging materials may inadvertently end up in the final product. The impact on food quality can be more than just an aesthetic concern; foreign bodies can cause life-threatening incidents. The three most frequently reported kinds of foreign bodies are plastic, metal and glass. These hard materials can cause injury to the human digestive tract and, in some cases, can be toxic. Foreign bodies are typically found in ground or bulk raw materials such as cereals or flours as well as in processed foods. Glass fragments, for example, are usually found in products packaged in glass, where accidental damage can lead to contamination by foreign bodies.

#### Why should food producers care about foreign bodies?

Foreign material of any kind can potentially introduce a physical hazard into a food product. European legislation requires that food producers comply with various hygiene regulations to ensure that food is safe and hazard-free. This includes the reduction and elimination of foreign bodies in food. In the USA, hard or sharp foreign objects are legislated as adulterants; the failure to prevent them from entering the final product can result in prosecution by regulatory authorities. The resulting damage to the brand of the producer can be considerable.

#### How can food producers detect foreign bodies?

Visual inspection, while important as an initial step, can be subjective; its effectiveness is subject to human error and can be influenced by any number of factors, such as lighting, heating, ventilation and noise. Highly sensitive, automated systems are generally the industry standard. Some frequently used technologies on the market that can detect certain foreign bodies include thermal imaging systems, metal detectors and X-ray systems. These systems are well suited for various larger objects that may enter the food production process. Metal detectors, of course, are not able to detect glass or plastics. Both X-ray and IR-imaging can distinguish larger contaminants from the food product thanks to their differing energy spectrums.

These technologies, however, cannot detect the smaller particles caused, for example, by abrasion from parts in production machinery. Furthermore, the efficacy of these technologies can be vouchsafed only if most of the final food product is able to pass through the limited detection area of the systems. The market currently lacks a solution that can detect microscopic materials during the production process and as part of cleaning verification. Small microscopic particles, whether introduced by abrasion or by the use of cleaning equipment or cleaning agents, could represent a serious risk to consumers in that they may indicate the presence of larger foreign bodies in the production line. As part of a general cleaning programme, the monitoring of microscopic particles can minimise the contamination risk from larger foreign bodies.

Making the world's Food Safer®



## 2020

### IAFP USA

25-28th October  
Virtual event  
[www.foodprotection.org/](http://www.foodprotection.org/)

## 2021

### IPPE

26-28th January  
Atlanta, GA, USA  
[www.ippexpo.org](http://www.ippexpo.org)

### Eurotier

9-12th February  
Hannover, Germany  
[www.eurotier.com](http://www.eurotier.com)

### Interpack Processing & Packaging

25 Feb-3rd March 2021  
Düsseldorf, Germany  
[www.interpack.com](http://www.interpack.com)

### GFSI Conference

2-5th March  
Virtual event  
[www.myGFSI.com](http://www.myGFSI.com)

### ANUGA Foodtec

23-26th March  
Cologne, Germany  
[www.ANUGAFoodtec.com](http://www.ANUGAFoodtec.com)

### Kenyan Food Event

20-22nd April  
Nairobi, Kenya  
[www.kenyanfoodevent.com](http://www.kenyanfoodevent.com)

### Meat Pro Asia

22-24th September  
Bangkok, Thailand  
[www.meatsproasia.com](http://www.meatsproasia.com)

## APPOINTMENTS

### STEFAN SCHEIBER

Bühler Holding AG  
Member of the Board of Directors  
[www.buhlergroup.com](http://www.buhlergroup.com)

### ED STEELE

Bettcher Industries Inc  
President  
[www.bettcher.com](http://www.bettcher.com)

### MARK HOLT

Bettcher Industries Inc  
Vice President Sales  
[www.bettcher.com](http://www.bettcher.com)

### KYLE STOFFER

Bettcher Industries Inc  
Chief Financial Officer  
[www.bettcher.com](http://www.bettcher.com)

### THOMAS HOLM

Cantrell Gainco Group  
President  
[www.cantrellgainco.com](http://www.cantrellgainco.com)

### RUSS STRONER

Cantrell Gainco Group  
Vice President Sales  
[www.cantrellgainco.com](http://www.cantrellgainco.com)

### MARK BOWRON

Acheta  
Operations Manager  
[www.acheta.co.uk](http://www.acheta.co.uk)

### MARCO AZZARETTI

Key Technology  
Director of Marketing  
[www.key.net](http://www.key.net)

## Seal and package integrity



With LeakCheck, GEA is launching a new in-line

measurement system capable of checking seal and package integrity on all forms of modified atmosphere packs (MAP) contactless. This guarantees the protective function and the quality of the food packaging for goods in perfect condition. Consumers want fresh, hygienically packaged food while retailers want long-lasting products that look attractive. Positioned at the start of the supply chain, food manufacturers must provide solutions that meet all hygiene and quality standards. Meeting these demands while at the same time boosting productivity calls for end-to-end process monitoring automation.

First came GEA's tried-and-trusted OxyCheck quality control system, whose contactless, non-invasive oxygen content measuring system has been verifying every MAP since 2017. Based on that system, the GEA LeakCheck now uses an in-line process on the GEA thermoformer to test the seal and package integrity on each individual package. The test procedure comprises three steps.

First, the residual oxygen content in each package is measured with a fluorescent sensor spot printed on

the inside of the top film. Optical sensors mounted on the thermoformer project light onto the sensor spot, gauging the wavelength of the light emitted by the dye to accurately determine the oxygen content. This step alone significantly reduces the risk of defective packaging with excessively high residual oxygen levels.

Next, packages are subjected to overpressure and underpressure in a stress unit before a second contactless measurement is taken. If the new result differs from the first, the package seal is broken. Using the GEA CombiPick, for instance, the leaky package is automatically detected and accurately removed on exiting the packaging machine. This method ensures that even the smallest leaks are detected.

In order to boost food processing productivity, the industry is increasingly focusing on automation. The aim is to achieve a consistent or even enhanced product quality. Thanks to GEA LeakCheck, the two key factors for ensuring food safety – residual oxygen content and seal integrity – can now be continuously recorded and monitored on an end-to-end basis. Process errors are rapidly detected and the delivery of faulty packaging is virtually zero.

[gea.com](http://gea.com)

### Supporting the smart meat factory



Food and drink IT specialist CSB-System and leading food machinery company Handtmann are working together to provide further seamless integration between machines and ERP systems as part of the continuing move towards the Smart Meat Factory.

The collaboration is designed to offer meat companies benefits such as real-time monitoring of machines and Overall Equipment Effectiveness (OEE) reporting.

In their first project, CSB and Handtmann are enabling meat processor Wolf to achieve complete transparency throughout the filling process through the connection of the company's sausage filler lines to its central business software.

The expanded communication platform means existing orders in the CSB ERP system can be

transmitted directly to the Handtmann Communication Unit (HCU) of the filling machines, while these machines are able to return details of fill levels. In addition, the HCU interfaces enable the transfer of data concerning individual fillers, their sequences, number of operators and required set-up and filling times. The HCU is also able to control additional tasks such as the limitation of adjustable parameters and weight regulation. Quality data, for example the quality of natural casings, can be keyed into the HCU and incorporated directly into a vendor assessment.

Alongside this, the CSB-Maintenance Management programme has been incorporated. Any problems or malfunctions are now reported directly at the filler which then triggers a centralised documented workflow for the repair process.

[csb.com](http://csb.com)

### Cabinplant opens new facilities



Cabinplant, an innovative and global supplier of tailor-made processing solutions for the food industry, has opened a new factory, increasing the production area by 50% at their facilities in Haarby, Denmark. The investment follows a record financial result for 2019.

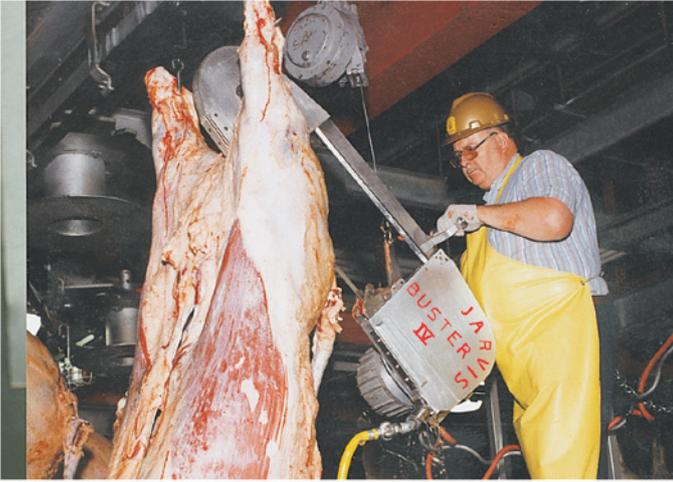
The expansion ensures Cabinplant sufficient capacity for continued growth in the coming years. The company has faced a significant increase in the demand for processing equipment aimed at the global food industry and the existing facilities have been utilised to the fullest.

Sales have increased by 25% over the last few years, reaching more than €50 million in 2019.

[cabinplant.com](http://cabinplant.com)

# JARVIS' BUSTER SERIES

## CARCASS SPLITTING BANDSAWS



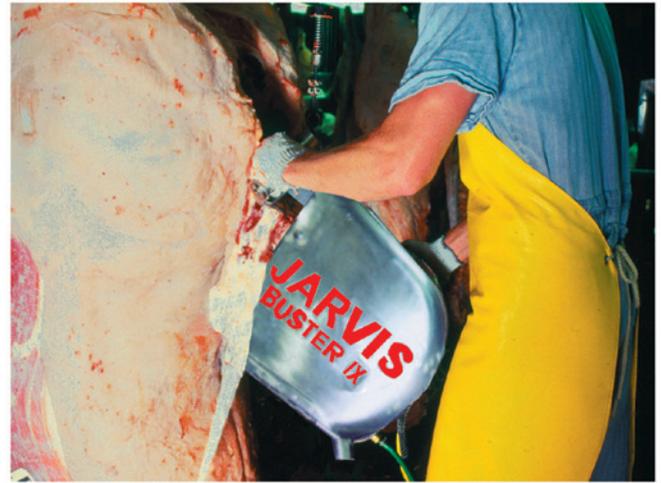
**Buster IV for Beef**



**Buster V for Beef**



**Buster VI and 6e for Pork**



**Buster IX for Beef**

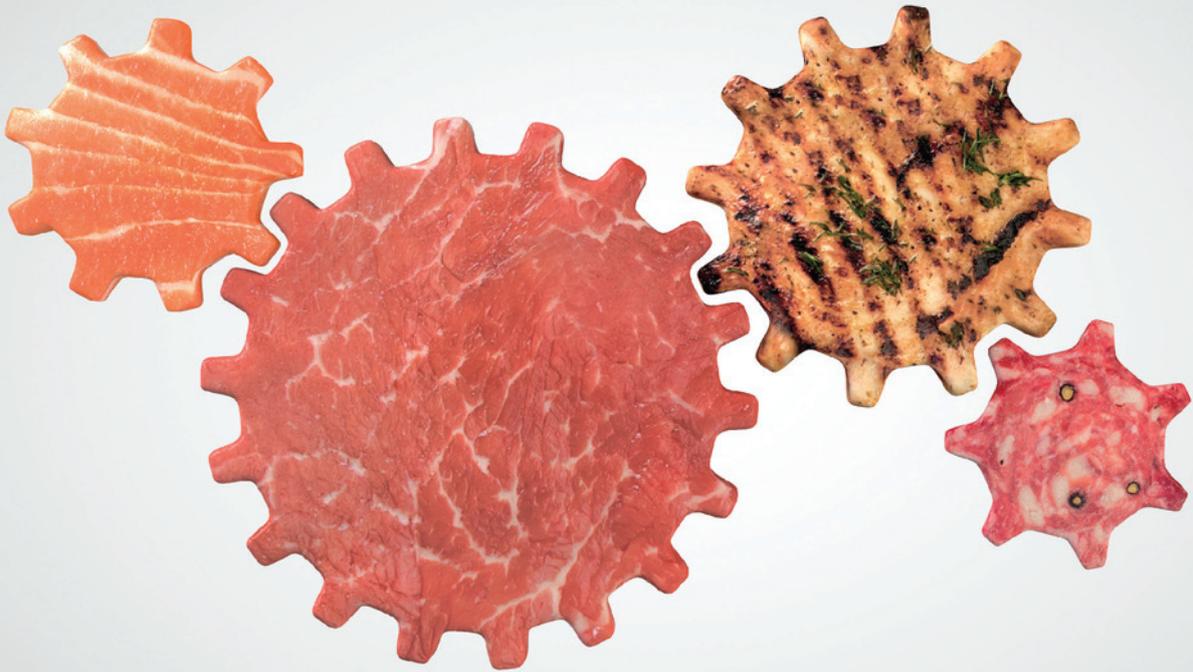
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Fax: (860) 347-9905  
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Web site: [www.jarvisproducts.com](http://www.jarvisproducts.com)

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Jarvis Products U.K. Ltd.  
Andy Foster, General Manager  
16 Ballycraigy Road  
Antrim BT41 1 PL  
Northern Ireland  
Tel: +44 2894 463921  
E-mail: [andy@jarvisuk.com](mailto:andy@jarvisuk.com)  
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