

## Innovation in safety - measuring arsenic levels

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Arsenic is known to be harmful to health, but not all forms of arsenic are equally toxic – the inorganic form is far more harmful than ‘organic arsenic’ (arsenic bound in organic molecules) and can cause long term health effects. The regulatory limits for arsenic in food therefore focus on inorganic arsenic, and it is important that methods of arsenic analysis distinguish between these types if the results are to be meaningful. We have developed a method that does just this.

The improved method accurately measures arsenic levels in food and drink products for regulatory compliance and to demonstrate due diligence in assuring product safety. Following low temperature extraction, species-specific hydrides are generated for on-line separation of inorganic and organic arsenic species, with subsequent detection by inductively coupled plasma mass spectrometry (HG-ICP-MS).

Using our HG-ICP-MS method we can accurately and specifically determine the levels of inorganic arsenic in rice, to check that they comply with regulatory limits. We have validated the method by measuring the inorganic arsenic in certified reference materials of foods that are at risk of absorbing higher levels of arsenic from the environment, such as seafood and rice.

## With industry, for industry

We work hard to ensure the industrial relevance of everything we do, but we can only do this with help from you - our members. We are therefore always delighted by the level of support we receive from you. Your input is particularly important this year as we are working on our major consultation with industry on its science and technology needs. You can get involved by letting us know three 'needs' that science and technology can address, for you or your company. Please provide your feedback via our survey [www.surveymonkey.co.uk/r/GPYRL9X](http://www.surveymonkey.co.uk/r/GPYRL9X).

I would like to thank you for your continued support on behalf of everyone at Campden BRI. The 'needs' discussions we have already had at Member Interest Groups has been excellent. Your input is vital to ensure the industrial relevance of our science, technology and knowledge services and research.

Steven Walker, Director General

## Microbiology webinar - free and on-demand

[www.campdenbri.co.uk/webinars.php](http://www.campdenbri.co.uk/webinars.php)

Although the food industry works diligently to ensure the food it produces is safe, microbiological incidents do sometimes occur. Learning the lessons from these incidents can help us all to develop new processes and methods to further reduce risk. Watch the free 30 minute webinar to hear Roy Betts, our Head of Microbiology, outline some of the recent microbiological issues from across the food industry. He is joined by our virologist, Martin D'Agostino, who explains some of the current challenges and developments with foodborne viruses.

### Switch channel



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## Rapid wheat grain analysis - application of hyperspectral imaging

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The presence of a few kernels with sprouting problems in a batch of wheat can result in enzymatic activity sufficient to compromise functionality of a whole batch of flour and bread quality. This is commonly assessed using the Hagberg Falling Number method, which is a batch analysis.

Falling Number is traditionally one of the more challenging things to measure using near infrared (NIR) imaging but published research carried out by Campden BRI (<https://doi.org/10.1255/jsi.2017.a4>) has demonstrated potential for Hyperspectral NIR imaging to provide analysis at the single grain level.

### Single wheat grain - rapid analysis

Results are promising in terms of wheat quality assessment using this rapid and non-destructive technique which is able to analyse wheat properties on a single-kernel basis, and to classify samples as acceptable or unacceptable for flour production.

Our hyperspectral imaging system also has potential for measuring properties of individual grains in a wide range of granular food materials - not just wheat - in addition to established applications to measure distribution of composition in finished products ([www.campdenbri.co.uk/white-papers/mapping-components-food-image-analysis.php](http://www.campdenbri.co.uk/white-papers/mapping-components-food-image-analysis.php)). The system is available for research and contract work to develop bespoke methods and to test feasibility of the approach for your own applications.



## Wine analysis

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A problem such as taint, flavour or aroma defect, a sediment or haze, or capping of aroma or flavour can have a big impact on the marketability of wine. Therefore, a small investment in wine analysis can save a fortune in lost sales.

### Optimise flavour and quality

Wine can be sampled at many stages including throughout the wine making process, pre-bottling / pre-shipment to point of sale and beyond. We have established and validated shelf life protocols, and offer over 100 analyses. Analysis can be used to answer specific questions such as improving quality, or 'what is the shelf life of my product?' or 'is my product legally compliant?' or can be used more broadly - for example, to verify typicity or authenticity or to demonstrate due diligence.

Wine analysis can also be used to optimise flavour and quality. Recently we teamed up with Flint Vineyard (Norfolk, UK) to identify the unique 'fingerprint' of the Bacchus grape variety. Flint Vineyard hope to use the results to determine the best winemaking techniques to express the grape's potential.





## Packaging performance - making the most of your product

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Packaging is fundamental in providing safe, high quality food and drink products to the consumer. Good packaging can also reduce food waste, reduce packaging costs and increase shelf life. Here are some examples we have helped with recently.

### Reducing food waste

Ensuring that existing packaging functions correctly is also vital to prevent food waste. It has been suggested that nearly a third of food is wasted, and about half of this is before it reaches the consumer.

Common issues can be seams on cans, leaking seals, break down of materials and damage to packaging. We can help by investigating a whole range of packaging issues. We can perform over 30 package performance tests across a range of areas - including strength and integrity, seam assessment and

permeability testing - to ensure that packaging meets manufacturers' specifications and performance requirements.

### Minimising packaging

We are commonly asked by clients to help them minimise packaging ('light-weighting') whilst maintaining its ability to protect the product. In a study for a client, we were able to conduct a range of tests to assure them that their product would not be compromised if they removed a layer of material from their packaging. This allowed the company to reduce the amount of packaging they were using and reduce costs.

### Using new technologies

Other work we carry out includes investigating new technologies, such as "Dubble Bubble" (developed by Dubble Bubble and using an updated vertical form fill seal machine built by Ulma), to see how they can reduce pack damage and increase shelf life. Dubble Bubble is designed to protect delicate products, which are suspended in a 'hammock' surrounded by a cushion of air or modified gasses. Work so far has looked at soft fruit, salad leaves, tomatoes and red meat.

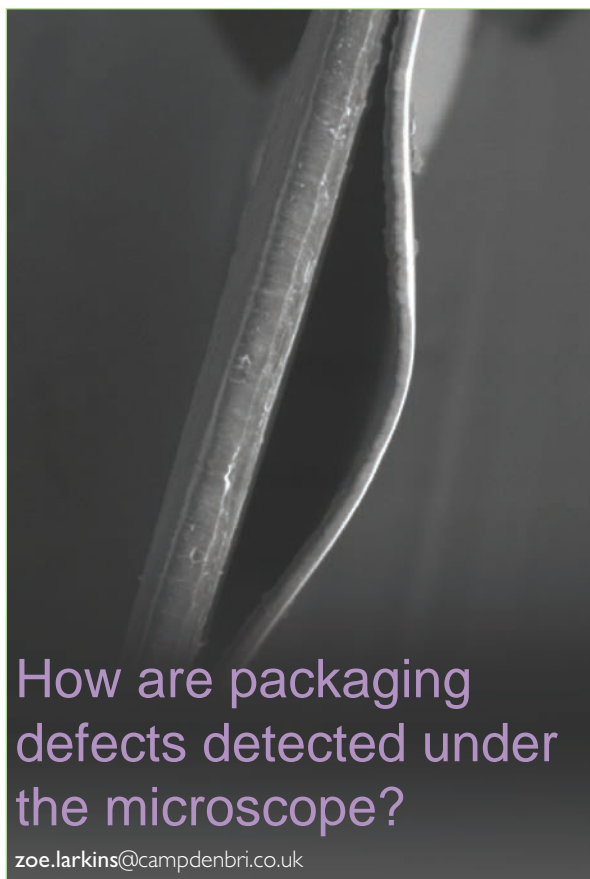


## Extending shelf life

Packaging can affect shelf life by slowing the growth of microorganisms, extending how long the product remains safe and retains acceptable sensory characteristics. We have a range of facilities for packing different products in several pack formats, including modified atmosphere. The use of gases in modified atmosphere packaging or active packaging can extend shelf life. Modified atmosphere packaging can be used to reduce oxygen levels and slow the activity of aerobic organisms and oxidation reactions.

Active packaging, the incorporation of an active system into packaging film or a container, can help to maintain the quality or extend the shelf life of the product. Typical systems used include oxygen and carbon dioxide scavengers or emitters, moisture absorbers, ethylene scavengers and ethanol emitters.

We have a range of facilities for packaging analysis and for strength and integrity testing, as well as both chemical and sensory taint analysis capabilities - to check your packaging is fit for purpose and to help ensure your packaging makes the most of your product.



## How are packaging defects detected under the microscope?

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We use a comprehensive range of techniques to carry out packaging investigations. Through the identification and characterisation of layers in multi-laminates, defects - such as faulty seals, delamination, perforations and pin holing - can be detected. To do this we use different microscopes.

**Stereo microscopy** - a simple visual examination can help steer the assessment

**Compound microscopy** - thin cryostat (frozen) sections of packaging under a compound microscope allow us to view and measure multiple layers.

**FT-IR Microscopy/Spectroscopy** - used to identify plastic materials/layers, by viewing a cross-section and mapping areas of it under the FT-IR microscope. From this we look at spectrums from individual areas of interest and match these against an extensive library to identify each layer.

**Scanning electron microscopy and x-ray mapping** - used for identification of metallic layers. An elemental map is run on an edge-on section of interest and this shows us a visual representation of the distribution of the elements present.

These tests complement a complete packaging analysis service covering all forms of packaging, using additional techniques including micro-CT scanner, dye penetration testing, pressure testing and migration testing.



## Training events

A full list of scheduled courses is available on our website [www.campdenbri.co.uk/training.php](http://www.campdenbri.co.uk/training.php) or request a booklet from [training@campdenbri.co.uk](mailto:training@campdenbri.co.uk) +44(0)1386 842104

### September events

- 6 Threat Assessment Critical Control Point (TACCP) - foundation level
- 6-7 HACCP - intermediate (level 3)
- 7 Root cause analysis
- 11-15 HACCP - advanced (level 4)
- 12-13 Threat Assessment Critical Control Point (TACCP) - intermediate level
- 18-21 Sensory evaluation workshop
- 18-22 FSSC 22000 Auditor/Lead Auditor course
- 19-21 Practical microbiology - foundation
- 21 HACCP for craft brewers
- 25-29 Food safety - advanced (level 4)
- 26 HACCP - foundation (level 2)
- 27-28 Internal auditing – principles and practices
- 28 Cake - practical skills

## Seminars

### Global food law challenges and opportunities

[www.campdenbri.co.uk/global-food-law.php](http://www.campdenbri.co.uk/global-food-law.php)

19 September

Maintaining an awareness of current food and drink legislation, understanding its implications and remaining alert to changes is increasingly challenging - a 'one size fits all' approach for the creation of products that comply with each market is not possible. A further challenge is the UK's exit from the European Union and what this might mean for the UK's food industry. This seminar will combine expert perspectives with discussion to cover emerging international food regulatory topics and regulatory landscape changes.

### Sugar reduction in bakery

[www.campdenbri.co.uk/bakery-sugar-reduction.php](http://www.campdenbri.co.uk/bakery-sugar-reduction.php)

22 September

Sugar reduction in bakery is a hot topic. Producers of bakery products are looking to replace or reduce sugar in their baked goods to comply with a 20% mandated reduction, weighted across four bakery categories, from Public Health England. This will be a difficult target for the industry to achieve and current technological solutions are not enough. This seminar will enable companies to find out about solutions currently available as well as those under development that will help them address the issues.



# Member zone

[www.campdenbri.co.uk/memberzone.php](http://www.campdenbri.co.uk/memberzone.php)

to access privileged member information and services



## MIGS

Through the MIGs you can: discuss topical industrial issues, meet with industry peers, consider the impact of emerging legislation, select and steer research and enjoy early access to research results. They are a great opportunity for continuing professional development.

### With members, for members

Our MIGs are chaired and driven by member companies to ensure meeting content is relevant to the industry. Any full member of Campden BRI can attend meetings. Associate members are not eligible to attend meetings but can access minutes and agendas via the member zone of the website.

## If you missed it

[www.campdenbri.co.uk/campdenbri-day.php](http://www.campdenbri.co.uk/campdenbri-day.php)

This year's Campden BRI day lecture "A coming of age for the Food Standards Agency" delivered by Heather Hancock is available on the website, as are the day's posters and briefing presentations.

## Autumn 2017 and 2018 MIG dates

[www.campdenbri.co.uk/research/migs.php](http://www.campdenbri.co.uk/research/migs.php)

Group	Autumn '17	Winter '18	Spring '18	Autumn '18
Agri-Food	5 October	31 January	9 May	26 September
Brewing and Fermented Alcoholic Beverages	18 September	23 January	15 May	18 September
Cereals, Milling and Baking	10 October	8 February	10 May	9 October
Food and Drink Science	12 September	16 January	1 May	11 September
Food Service	28 September	25 January	17 May	20 September
Meat and Poultry	21 September	30 January	23 May	25 September
Microbiology	13 September	17 January	2 May	12 September
Nutrition and Health	4 October	13 February	30 May	3 October
Packaging	12 October	7 February	31 May	4 October
Processing, Operations and Preservation	27 September	1 February	24 May	27 September
Quality and Food Safety Management	14 September	18 January	3 May	13 September
Sensory and Consumer	3 October	6 February	22 May	2 October



## Welcome to new members

We are delighted to welcome the following new members:

ADI Food and Beverage Services Limited - project management of the design, building and maintenance of food/beverage installations

Bantry Bay Mussels Ltd - mussel producer

Blends for Friends - blenders of tea and fruit infusions

Peachtree Nutrition Ltd - manufacturers of nutrition based food-to-go range

Pipkin & Moo - manufacturers of baby food

The Chichester Biltong Company - manufacturers of biltong

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*Please notify the Membership Department of any changes to your company's name or address to allow us to keep our records up to date.*

## IFT17 Go With Purpose Global Challenge

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Continuing our work to help plug the skills gap across the industry we are working with initiatives that encourage and engage students, including The Go With Purpose Global Challenge run by IFT (Institute of Food Technologists). The challenge asks international students to think creatively and critically about global food issues.

The selected participants, working in teams, re-evaluated a food product using the resources offered by the IFT 2017 annual meeting and food expo. The teams received guidance from industry mentors - including our Head of Membership and Training, Bertrand Emond - and an opportunity to network with food industry leaders. Bertrand helped his team consider alternative protein sources for soy-based protein bars.

The participants will have the opportunity to participate as a panellist at the 2017 IFTSA virtual Global Summit in November.

## New blogs on the web

[www.campdenbri.co.uk/blogs/campdenbri-blogs.php](http://www.campdenbri.co.uk/blogs/campdenbri-blogs.php)

Process development of retorted foods - your top three most frequently asked questions

by Sarah McFarland

Good hygiene starts with kitchen design

by Emma De-Alwis

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For other sites, see

[www.campdenbri.co.uk/campdenbri/contact.php](http://www.campdenbri.co.uk/campdenbri/contact.php)

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