



Automated control of food processes enables greater process efficiency, more consistent product quality, and improved food quality and safety assurance. Harnessing these benefits requires reliable on-line sensors capable of measuring relevant process conditions and product characteristics. A wide range of sensors are available, but many properties still rely on manual sampling and analysis.

### Non-invasive approach

We are evaluating new approaches to on-line measurement. Electrical tomography, for example, is a non-invasive approach that measures the distribution of materials inside process vessels based on their electrical properties. Applications include interface detection, and measurement of homogeneity, aeration, and flow rate. Through practical trials we have explored applications for batter, sauces and fruit juice, based on conductivity. Capacitance systems are also available, suitable for non-conducting materials such as fat-based products and dry particulates.

Trials of further technologies are planned, including a foreign body detection system for pumpable products. As with all member projects, suggestions are welcomed for both trial products and technologies.

See overleaf for the project's R&D reports.

## On-line technologies for food process control

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## Strategic campaigns

Building on our extensive consultation with members on the innovation needs of industry, we are working in four new strategic areas of focus: sensory branding and consumer insights, health and nutrition, international regulatory affairs, and food-borne viruses. We are investing to ensure that we have the cutting-edge facilities and expertise to support your business in these areas, both now and in the future.

We are pleased to have made significant progress. We have opened a new dedicated consumer test centre in the Midlands to support growing demand from clients for consumer input into new product development. Our newly created Nutrition and Health Member Interest Group (MIG) met for the first time this month, with capacity attendance, proving a popular forum for members to discuss the challenges in this area. We have significantly expanded our international regulatory affairs team to broaden the number of languages covered to include Japanese, Chinese, Arabic, Spanish and Russian. We have also recruited a virologist to strengthen our activities in food-borne viruses.

To keep up to date with our latest activities, you can sign up for our newsfeeds by visiting [www.campdenbri.co.uk/optin.php](http://www.campdenbri.co.uk/optin.php).

Steven Walker, Director General

## On-line technologies for food process control

Continued from front page

This member-funded project is reviewing and evaluating available on-line sensing technologies and their suitability for food process control.

- Project web page - [www.campdenbri.co.uk/research/food-process-control-technologies.php](http://www.campdenbri.co.uk/research/food-process-control-technologies.php)
- A review of established technologies - R&D report 388.
- Electrical Tomography is reviewed in R&D report 400, and has been demonstrated at recent MIG meetings.

### Switch channel



**LinkedIn** - company news  
[www.linkedin.com/company/campden-bri](http://www.linkedin.com/company/campden-bri)



**YouTube** - videos on the science and technology of food and drink production  
[www.youtube.com/campdenbri](http://www.youtube.com/campdenbri)



**Twitter** - keep up to date with our latest news and activities  
<https://twitter.com/campdenbri>



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## UHT processing facilities for low sugar drinks

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With the announcement of a sugar tax on beverages there is likely to be increased interest in reformulation of beverages. We have recently used our UHT/HTST tubular heat exchanger to produce samples of low sugar fruit and dairy drinks as part of a member research funded project on sugar reduction. We flash pasteurised and hot filled an ambient stable, reduced-sugar fruit juice drink, containing apple, blackcurrant and raspberry juice, water and steviol glycosides. A chilled banana milk shake also containing steviol glycosides was also produced.

The unit is suitable for a range of products including dairy beverages, milk shakes, fruit juices, smoothies and beverage syrups, as well as fortified and functional beverages, smooth sauces and soups. Tubular and plate heat exchangers are interchangeable, the former possessing variable tube holding options, and it can process at temperatures up to 150°C. UHT/pasteurisation throughputs of up to 20 litres/hour are ideal for NPD samples, and the computer controlled system comes with a data logging system.

See also pages 4-5.

## Latest on the web

### Japan - a gateway to Asia

Blog by Asako Nagata

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

Choosing the right market when exporting food is an exciting yet challenging task. Potential trade barriers, market trends, and competition with local products are just some of the factors that can work for or against you.

### Challenges in microbiological identification

Blog by Julie Archer

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

Julie Archer, microbiologist, discusses some of the common issues and challenges in microbiological identification and the sophisticated DNA-based methods we use to help food and drink companies.



## Electronic records in thermal processing

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Process records are an essential part of food manufacturing and are a key requirement to meet regulations and comply with the necessary codes of practice. Despite rapid technological advances elsewhere, many food manufacturing companies still rely on paper records to record and store this information.

A new guideline - *Electronic process records in thermal processing* (Guideline 77) - introduces the concept of electronic data record-keeping to help with the transition from a paper-based to a paperless system.

Contents include:

- Electronic process records - overview of benefits and limitations
- Process records in thermal food processing
- Regulatory guidance for electronic records
- Traceability of electronic thermal process records
- Electronic data review and approvals
- Data saving and retention
- Electronic thermal process data: quality, integrity and security
- Validation of electronic thermal process data: hardware and software
- Thermal process data records: auditing and training considerations



## Pilot plant for soft and alcoholic drinks

Visit our on-line pilot plant at [www.campdenbri.co.uk/tours/pilot-plant.php](http://www.campdenbri.co.uk/tours/pilot-plant.php) or email [information@campdenbri.co.uk](mailto:information@campdenbri.co.uk)

Developing new drinks products - be they carbonated or still soft drinks or beers, lagers and ciders - requires technical input from many sources. 'Trying out' the new formulation and/or process at something that approximates to full production conditions is vital. Our pilot plant facilities can enable you to do just that, with a range of equipment to suit different needs. Below are some examples.



### Flash pasteurising soft drinks

We regularly receive enquiries for UHT/flash pasteurisation from companies wishing to develop drinks. They would like to be able to flash pasteurise their beverages and beverage syrup prior to carbonating and filling using our new carbonator. Our Armfield flash pasteuriser fulfils this need - and is also suitable for the pasteurisation of dairy drinks. The laminar flow cabinet facilitates 'clean fill' of product, and the system allows clients to see the effect of processing on their product.

These units are very suitable for product development trials where relatively small volumes of products (2-8 litres) are required. However, they are also capable of producing the slightly larger quantities of products required by some clients.

### Pilot maltings

As with soft drinks, developing beers requires knowledge of how the product will react to scale-up. Our 50kg pilot maltings were built to bridge the enormous gap between



## Brewing process development

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From raw materials processing to packaging, the key to brewing process development is the ability to define the process to achieve the market aim. This is especially the case with the many flavoured and novel beers and ciders entering the market, which pose new technical challenges. The combination of pilot plants, laboratory support and sensory evaluation makes us a 'one-stop-shop' for new product development.

Our pilot maltings and brewery are designed for maximum process flexibility and can make product to a commercial standard, which is reproducible on full scale-up. Sometimes the most efficient route involves small-scale developments in the laboratory, such as brewing on the one-litre scale or trying a variety of different fermentative microbes to identify the most successful. We have successfully produced a range of alcoholic and non-alcoholic beverages, including novel fermented "health products", and our short run bottling services can provide test beers for retailers.

Our world-class laboratory facilities and expertise support the development process by characterising the products and comparing them with potential competitors in the market-place. Sensory evaluation is a skilled process and our team will provide invaluable expert comment to the client as we work together to optimise the product.

conventional micro malting systems and the 'real world' of full-scale production. Steeping and germination are carried out in malting drums but the kilning takes place in dedicated units which accurately simulate modern deep bed kilning systems. The whole maltings are automated and can operate over a very wide range of temperature and humidity. This enables it to mimic the many different conditions found in malting plants all over the world. And as well as product development, it can also be used for research into process, health and safety issues and training. We also have pilot roasting facilities.

### Pilot brewery

Once the malt has been produced, it can then be used in our pilot brewery. The brewhouse comprises a mashing station, stirred mash conversion vessel and cereal cooker, wort separation by lauter or Meura mash filter, stirred kettle, and trub separation by whirlpool or hop back. Fermentation is in 100 litre cylindro-conical FVs, which can also be used as unitanks. Amongst the many special features installed in the brewery are carbon dioxide and nitrogen bulk gas tanks, a gas blender, a hydrophobic gas control rig for the production of deaerated liquor and for carbonation/nitrogenation of beer, and a flash pasteuriser.



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## Thermal processing conference

30 June - 1 July

[www.campdenbri.co.uk/thermal-processing-conference.php](http://www.campdenbri.co.uk/thermal-processing-conference.php)

This conference will focus on the latest academic, industrial and regulatory aspects of producing commercial heat preserved foods. Presentations will be on topical aspects governing the safety and quality of thermal processed foods, with technical sessions divided into the following themes:

- Secrets of successful thermal processing
- International research activities
- What's next for thermal processing?

## 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

### July events

- |       |  |
|-------|--|
| 4-8   | FSSC 22000 Auditor/Lead Auditor Course                             |
| 4-8   | HACCP - Advanced (level 4)   |
| 5     | Packaging Hazards: What they are and how they affect your business |
| 6     | Food Law - Food Improvement Agents Package                         |
| 11-12 | HACCP - Intermediate (level 3)                                     |
| 13    | Decontamination of fresh produce                                   |
| 13-14 | HACCP auditing - intermediate                                      |

## Training academies

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If you want to take a structured approach to technical training across your business - from needs analysis through to delivery of tailored content - our successful training academy model can deliver just what you need. Bespoke approaches and bespoke content, at a time, place and pace to suit your needs.

## Seminars

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### Packaging hazards: what they are and how they affect your business 5 July

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

Identification of hazards associated with food and drink is a long established and key priority within the industry. Hazards associated with packaging are less well documented and may not be considered, but they can affect the safety and quality of the product.

### Decontamination of fresh produce - chlorine and its alternatives 13 July

[www.campdenbri.co.uk/decontamination-fresh-produce.php](http://www.campdenbri.co.uk/decontamination-fresh-produce.php)

Wash water sanitisers are relied upon by processors to reduce microbial counts and thus extend shelf-life and quality. Organic acids and other non-chlorine based sanitisers have been tried as alternatives in the past. This seminar will explore the use of different anti-microbial agents and the latest technologies in this context.

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

# Member zone

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

to access privileged member information and services

## R&D reports

A list of all Campden BRI R&D reports since 2010 is available at [www.campdenbri.co.uk/research/reports.php](http://www.campdenbri.co.uk/research/reports.php) along with access to a searchable database of all R&D reports.

### Electrical tomography for online food process control

[www.campdenbri.co.uk/research/food-process-control-technologies.php](http://www.campdenbri.co.uk/research/food-process-control-technologies.php)

Online sensors can provide continuous monitoring with the potential for automated control, rapid identification of fault conditions, and improved quality and safety assurance. Electrical tomography has the potential for food process measurement applications. [Review of electrical tomography for online food process control](#) (RD400).

### Enhancing consumers' enjoyment of 'healthy' food and drink products

[www.campdenbri.co.uk/research/packaging-design.php](http://www.campdenbri.co.uk/research/packaging-design.php)

There is a growing demand from both government and consumers for food and drink products that support a healthy lifestyle. A recent study aims to understand how the satisfaction scale enhances and validates traditional liking measurements by recording the emotional and sensory components of the satisfaction experience. [How the satisfaction scale enhances and validates overall hedonic liking measures in the context of green tea](#) (RD401).

### Modification of flour functionality

[www.campdenbri.co.uk/research/ingredient-functionality.php](http://www.campdenbri.co.uk/research/ingredient-functionality.php)

Ingredient specifications for traditional bread products are well documented and understood. However, more than one third of all flour produced in the UK is used for non-bread applications. Flour conforming to specifications using test methods for bread flour may not always perform as expected in a non-bread final product. [Modification of flour functionality](#) (RD402) reviews methods of flour modification.



Welcome to new members

We are delighted to welcome the following new members:

- AB Inbev I & TD - brewer
- Bahlsen LLP - biscuit manufacturer
- Delisante Ltd - producer of savoury baked products
- Follain Teoranta - manufacturer of jams, preserves, pickles and sauces
- Forrester (Sales) Ltd - supplier of cooked, raw and coated poultry
- Googlyfruit Ltd - manufacturer of toddler foods
- Hijos De Rivera SAU - brewer
- Kepak - Clonee - beef processor
- Michelman Sarl - manufacturer of environmentally friendly advanced materials for industry
- More Food Ltd - cake manufacturer
- National Nuclear Laboratory (NNL) - provider of products and services covering the nuclear fuel cycle
- Netto UK - retailer
- Newport City Council (Trading Standards) - local authority
- PMJ Foods - poultry processor
- Red Arrow Handels-GmbH - distributor of smoke, grill and browning flavours
- Rheonix Inc - multiplexing diagnostic company
- Savoury and Sweet Ltd - popcorn manufacturer
- Tuk In Foods - manufacturer of savoury snacks
- Vedeqsa - manufacturer of food additives and ingredients
- Veolia UK - provider of solutions related to waste recovery
- Volta Belting Technology - manufacturer of thermoplastic belting

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



## Food authenticity resources bulletin

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A new bulletin, an output of the project *Food authenticity - development of "next generation" analytical technologies to protect the food industry from fraud*, will provide members with information associated with food authenticity, adulteration and fraud. It will keep you informed of both specific and general issues, and provide information sources to help vulnerability risk assessment; there will also be updates on horizon scanning, detection technologies that can be used by industry, developments with standards, relevant surveys, research projects and events.

The first edition has general information on links to food fraud information sources, including the "Elliott Report" and Government and industry responses, and an in depth article looking into Stable Isotope Ratio analysis, a technique used in determining food origin. An on-line questionnaire with each bulletin will enable members to tailor subsequent bulletins, flag up issues and raise awareness.

The bulletin is available on the project web page at [www.campdenbri.co.uk/research/food-authenticity.php](http://www.campdenbri.co.uk/research/food-authenticity.php)

## Improving food security and nutrition 6 July

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web address to follow

Run in collaboration with BBSRC, this seminar will showcase projects from a range of public-private partnerships - including the Crop Improvement Research Club (CIRC) and the Diet and Health Research Industry Club (DRINC) - both of which are supported by Campden BRI as a founding member. Together these clubs have supported 46 research projects with over £26M in funding. Eight world-leading academic researchers will present on research and innovations from cutting edge areas such as plant genetics, crop breeding, biochemistry, food science, nutrition and applied psychology.

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For other sites, see  
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