



Initial studies have shown that time-temperature integrators (TTIs) can be adapted to mimic nutrient and quality marker destruction during heat processing. These could help optimise cooking regimes to deliver better quality product and avoid unnecessary time and energy consumption.

Preservation of a food's nutritional and sensory attributes during heat processing is very important for quality and consumer acceptance of the product. TTIs are widely used in thermal process validation where conventional temperature probes cannot be used. A small quantity of enzyme (amylase), encapsulated in a TTI and having similar thermal kinetics as target microorganisms, can be used to measure the degree of heat treatment given to the product. The principle can apply to quality markers.

Preliminary studies on the manipulation of TTI kinetics have shown that D and z values can be modified by altering initial enzyme concentration, calcium concentration and pH. This underpins the development of TTIs as more accurate and consistent quality sensors.

Experiments are planned to further test TTIs and mathematical models as indicators for cooking regime optimisation. Manipulation of the kinetics of TTIs will be continued to achieve a closer match to quality marker kinetics, and these will be further tested in real food systems and on an industrial scale.

## Optimising cooking for better quality

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# Pilot plant on-line

Whether you are looking to develop a new product or refine existing processes, we can help you explore innovative but commercially relevant approaches to delivering safe, high quality products to your target market.

With over 3,000 square metres of pilot process facilities, and associated laboratories and meeting facilities, we work with companies big and small to help develop new products, analyse existing processes, and evaluate ideas. You can now explore some of the equipment we have in our virtual pilot plant at [www.campdenbri.co.uk/tours/emerging-technologies.php](http://www.campdenbri.co.uk/tours/emerging-technologies.php). Using this plant removes the need for costly interruptions to production, reduces waste and provides an opportunity to assess production implications on a manageable scale.

Over the next two months we will be highlighting opportunities around manufacturing and processing. To keep up to date with our latest news and research in this area you can opt-in to our newsfeeds by visiting [www.campdenbri.co.uk/optin.php](http://www.campdenbri.co.uk/optin.php).

Steven Walker, Director General

## Have you registered for Campden BRI day - 8 June?

This is your chance to see our facilities, meet technical experts here, and network with peers. The day will feature displays under the themes: Food and drink safety; Product quality; Nutrition and health; Skills and knowledge. After lunch you have the chance to attend three short briefing updates covering: foodborne viruses, consumer insights, and an international regulatory issue. Our pilot plants will be open to view.

We are delighted that **Patrick Coveney**, CEO Greencore Group will present the 38th Campden Lecture.

Go to [www.campdenbri.co.uk/campdenbri-day.php](http://www.campdenbri.co.uk/campdenbri-day.php) to register and find out more about the event.

## Switch channel



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## On the podium at SenseAsia

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Peter Burgess and Dr Sarah Thomas will be participating in the second Asian Sensory and Consumer Research Symposium taking place in Shanghai on 15-17 May 2016. Peter, who sits on the conference scientific committee, will be chairing a session on the impact of oral processing on food perception and preference, while Sarah will be presenting Campden BRI's work on the ability of packaging to convey sensory and functional product information.

Topics being discussed at the conference include developments in measures of food choice/preference, cross-cultural influences on food choice, sensometrics, and the links between sensory science and health.

## New research helps chicken farmers create more productive environments

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A new research project is attempting to create an all-in-one environmental indicator and animal welfare monitoring sensor system to improve quality and welfare standards on poultry farms.

This system will allow farmers to closely monitor changes in the flock remotely. The research will look at how various environmental and welfare indicators can be monitored, including fluctuations in temperature and atmospheric measurements, as well as chicken vocalisations and thermal images of chickens.

The system will make it easier for chicken farmers to meet industry regulation and also offers improvements in efficiency and potential cost and waste reductions. Pilot data from Newcastle University suggest that it's possible to identify the level of feathering from a thermal image. The next step is to test this in a real farm situation.



## Which are the most challenging export destinations?

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Our International Regulatory Affairs team has been answering a wide variety of your questions around exporting, from permitted ingredients and legal names to translations and label checks. This prompted us to ask you which countries were the most important destination markets and which caused the most headaches. Our survey last month showed that the most important export markets were (not surprisingly) the EU, followed by China and the USA. When asked which countries were the most challenging, you identified China first with the USA a close second. Combining scores, China was a landslide winner - which might explain why our Chinese Food Law advisor, Xiangwen He, has proven to be such a popular contact!

Many thanks to those who participated in the survey, came to meet our International Regulatory team at the April Food and Drink Expo, or met with us to discuss international markets in more detail. The team will be at Campden BRI Day on 8 June, so please come and meet them.

If you have any international regulatory questions, please send them to us via [regulatoryadvice@campdenbri.co.uk](mailto:regulatoryadvice@campdenbri.co.uk) or for a more detailed discussion contact Linda Amirat, [linda.amirat@campdenbri.co.uk](mailto:linda.amirat@campdenbri.co.uk).



## Emerging technologies in food and drink production

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

Emerging technologies such as high-pressure processing (HPP) are now well established for achieving products with 'fresh' like properties, but with a shelf life of weeks or months rather than days. But more recently, technologies such as HPP and power ultrasound are also being used to change the properties of foods, to give an improved or novel product. Our 'new technologies' project has been evaluating many of these processing methods for over a quarter of a century, as the examples below illustrate.

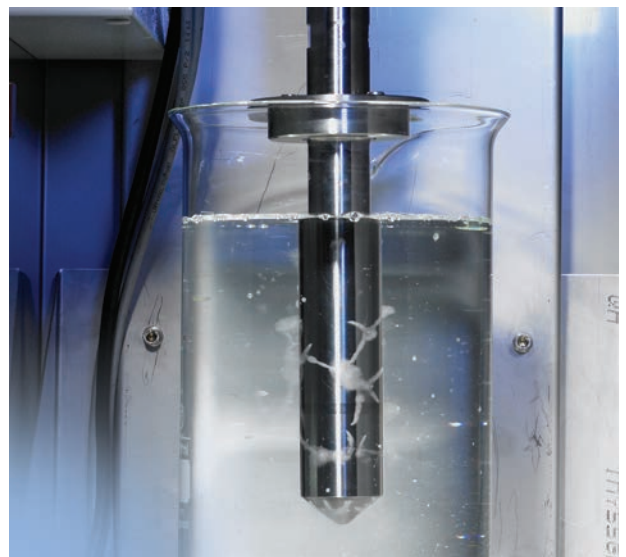
### High-pressure processing

HPP can preserve the organoleptic properties of fresh products by providing a microbiological reduction treatment without the associated thermal quality changes. HPP is now a mature technology and has reached the point where, rather than addressing scientific fundamentals, technologists are interested in the practical implementation, validation and management of HPP manufacturing. When validating HPP processes, a clear understanding of factors which could impact on process lethality is required. Factors such as pH and water activity are important as well as strain selection and growth phase. Maintenance and hygiene management of HPP equipment needs to be

effectively managed. Previous work, for example, has highlighted that higher bacterial counts are associated with the sealing arrangement and closures of the HPP vessel.

### Power ultrasound

The viscosity of a food can significantly affect processing efficiency. The effect of power ultrasound on hydrated solutions of thickening agents and food products was studied. A thinning effect of the ultrasound treatment was observed in a gelatinised starch solution, a mushroom





## Come and visit our Pilot Plant

[www.campdenbri.co.uk/services/pilot-plant-facilities.php](http://www.campdenbri.co.uk/services/pilot-plant-facilities.php)

You will be able to visit the pilot plant at our Chipping Campden site on Campden BRI Day, 8 June. We have a huge range of facilities, covering over 3000m<sup>2</sup>, to help you develop new products, analyse existing processes, and evaluate ideas for the future.

### Sample and ingredient preparation

- Peeling and blanching of fruit and vegetables
- Meat processing and preparation
- Mixers, blenders, homogenisers for soups and sauces

### Thermal technologies, chilling and freezing

- Thermal processing equipment, including retorts and pasteurisation tanks for canned products, pouches and trays
- Steam-jacketed pans, batch pressure cooking and cooling vessels
- Hot air and freeze driers
- Air blast chillers and freezers

### Baking and milling

- Milling and grain processing
- Baked product processing

### Beverages

As well as preparing ingredients for a wide range of drinks, we have facilities for packing and processing:

- Drinks carbonator and a citrus multi-juicer
- HTST/UHT unit with tubular and plate heat exchanger capabilities
- Malting/brewing facilities at our Nutfield site

sauce and a fruit preparation. The level of viscosity reduction depended significantly on the amplitude. In the three model systems, the modification of the sample viscosity was partially or fully reversible. A significant increase in viscosity after treatment (up to 62%) was observed in tomato paste, with the effect depending on treatment time. Reversible modification of viscosity could help optimise processes such as spray drying and filtration.

### Robotic handling

Uptake of robotics for food manufacturing is limited, and has primarily focused on end-of-line packaging handling. Increased automation is now leading to robots being used for food handling applications. A feasibility study investigated microbial build up on 3 different grippers and product during simulated production and looked at potential cross contamination using fluorescent dyes. Prolonged operation of the gripper handling the contaminated food product was necessary to understand where the microbial build-up might occur during production. There was no statistically significant effect on microbial counts in food of using vacuum and Bernoulli grippers, but contact grippers did result in greater microbial counts, suggesting that build-up on the gripper claws could also cause an increased microbial loading on the product over time.





## Seminars

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### Controlling process contamination 16 June

[www.campdenbri.co.uk/contamination-risks-seminar.php](http://www.campdenbri.co.uk/contamination-risks-seminar.php)

Understand the challenges and gain awareness of the issues and proactive methods to overcome hazards.

### Supplements legislation 21 June

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

The regulatory framework for food supplements is not fully harmonised. The principal issues involved will be discussed.

### Culture excellence

28 June

[www.campdenbri.co.uk/culture-excellence-seminar.php](http://www.campdenbri.co.uk/culture-excellence-seminar.php)

The importance of food safety and quality culture.

## 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

### June events

- 8 Campden BRI Day
- 14-15 HACCP - intermediate (level 3)
- 21-23 Food safety - intermediate (level 3)
- 21-24 Principles of baking
- 22-23 Food and drink labelling
- 22-23 Principles of pasteurisation
- 28 Nutrition and health claims
- 28-29 Threat assessment critical control point (TACCP) - intermediate level
- 29-30 HACCP - validation and verification
- 29 Setting shelf life: how to do it better
- 30-1 July Thermal processing conference

## New regulatory training courses

### Food law - food improvement agents package 6 July

[www.campdenbri.co.uk/training/food-law-food-improvements-agents-package](http://www.campdenbri.co.uk/training/food-law-food-improvements-agents-package)

We are launching a course on food additives, enzymes and flavourings. Lectures and practicals will enable delegates to confidently search for and locate additives in different food categories, understand the conditions of additive use and where restrictions apply, and use the knowledge gained during the development of new products, whilst ensuring that labelling requirements are met.

### USA food and drink labelling course

22 September

[www.campdenbri.co.uk/training/USA-food-drink-labelling](http://www.campdenbri.co.uk/training/USA-food-drink-labelling)

Getting labels correct is key in successfully exporting food to the US. The course will examine US food labelling in depth. The Food Safety Modernization Act and the effect on EU exporters of its Foreign Supplier Verification Programme final rule will be discussed along with the proposed Transatlantic Trade and Investment Partnership trade agreement between the US and the EU.

## Member zone

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

to access privileged member information and services

## Nutrition and health - new Member Interest Group

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[www.campdenbri.co.uk/nutrition-health-mig.php](http://www.campdenbri.co.uk/nutrition-health-mig.php)

Responding to members, we are creating a new Member Interest Group (MIG) as a forum for activity around nutrition and health. Members are invited to a preliminary meeting on *Wednesday 1 June* to shape the scope of the group's interests, as well as hear about current drivers, trends and work at Campden BRI. MIG membership is open to all full members of Campden BRI and attendance is free. To find out more, see the full programme, or register to attend visit [www.campdenbri.co.uk/nutrition-health-mig.php](http://www.campdenbri.co.uk/nutrition-health-mig.php)

## Member Interest Groups

Remaining dates for Spring 2016 round

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MIGs are open to all full members of Campden BRI. If you haven't been to a MIG meeting before, or have not attended one recently, why not sign up and give it a go (see our website for details and locations).

### Member Interest Group

Agri-Food  
Food Service  
Heat Preserved Foods  
Manufacturing Technologies  
Meat and Poultry  
Packaging  
Sensory and Consumer

### Spring '16

19 May  
10 May  
26 May  
25 May  
18 May  
17 May  
24 May

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

## R&D reports

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

This page lists all R&D reports published since 2010.

## Reducing sugar in drinks

Sugar reduction continues to be an important issue, with increasing pressure being placed on the beverage industry to continue to develop more reduced/low calorie options. A recently completed project investigated the impacts on final product characteristics of reduced sugar levels in products and of using high potency sweeteners (steviol glycosides and monk fruit extracts).

*Development of reduced sugar beverages* (RD397) and the related report *Considerations for calorie reduction in beverages* (RD398) are available on our website.

[www.campdenbri.co.uk/research/sweeteners-fat-replacers.php](http://www.campdenbri.co.uk/research/sweeteners-fat-replacers.php)

## High fibre bread

High fibre diets are associated with lower incidences of major health problems such as cardiovascular disease, Type 2 diabetes and colorectal cancer, but consumer understanding and general consumption remain low.

The effect of different processes and additional ingredients on improving bread quality was investigated. The report, *Optimisation of high-fibre bread* (RD399), can be accessed on the project web page:

[www.campdenbri.co.uk/research/improved-fibre-goods.php](http://www.campdenbri.co.uk/research/improved-fibre-goods.php)



## Welcome to new members

We are delighted to welcome the following new members:

AJ & CI Snell - fruit grower, processor and packer  
 Alwazzan Foodstuffs Industries Group - manufacturer of potato chips and popcorn  
 American Food Store - importer and retailer of American foods  
 Antrim and Newtonabbey Borough Council - Local Authority  
 Aran Ard Teoranta t/a Gallagher's Bakery - baker of bread and cakes  
 Aryzta Bakeries Europe - frozen bakery solutions provider  
 Carl - Kess Ltd - producer of West African ready meals  
 Cauli Rice Ltd - manufacturer of long life cauliflower rice  
 Cherrytree Bakery Limited - manufacturer of sweet baked goods  
 Chia Bia - producer of products containing Chia Seed  
 Islandslice Ltd - manufacturer of a Caribbean alcoholic cocktail  
 Life Health Foods UK Limited - manufacturer of breakfast cereals  
 Mendes Goncalves SA - producer of vinegar, condiments and sauces  
 Samia Foods Ltd - manufacturer of meal replacement drinks, soups and sauces  
 Sara Louise Kakes Ltd - manufacturer of cup cakes, muffins and brownies  
 WET Engineering Ltd - soft drink manufacturer  
 Woolworths Food Company - retailer and developer of own brand products

**Clare Brett** +44(0)1386 842125  
[membership@campdenbri.co.uk](mailto:membership@campdenbri.co.uk)

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

## Latest on the web

### High protein drinks - formulation and processing

Podcast by Fraser Courts

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

This podcast discusses the effect of heat processing on protein stability in protein-rich drinks, and how this can be predicted and managed.

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