



Beer brands utilise a blend of specific hop varieties in their recipes to give it a distinct aroma and flavour. But if any of these hop varieties are in short supply, which is becoming more common with the arrival of novel hop varieties, this creates a problem for the brewer. Ongoing research is investigating techniques for predicting the sensory attributes of blending hops in beer. The aim of this work is to help the brewer accurately match the sensory profile of any aroma hop which may be in short supply, with a blend of alternative hops.

A selection of hop varieties were assessed using state of the art chemical analysis, and by our beer sensory panel as 'hop teas' and single varietal beers. We found that whilst hop teas were a poor predictor of final product characteristics, the data from pilot scale single varietal brews combined with hop aroma profiles could be meaningfully evaluated. We then attempted to develop a hop blend to mimic the aromas and flavours provided by the hop Amarillo, which is both expensive and in short supply. We selected another variety with similar characteristics, and then blended it with a second hop variety that essentially plugged the gap in terms of specific aroma notes. We were very encouraged to find that this blending strategy resulted in a product that our expert beer tasters could not distinguish from the original Amarillo-hopped beer.

We are currently looking at the best times to add hops during the brewing process, and at the effects of dry hopping on final product characteristics.

Predicting the effects of hop blending

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See a video interview on the work at
www.campdenbri.co.uk/research/hop-blending-beer.php

Leading research and innovation in food and drink

We work 'with industry, for industry'. It's therefore crucial that we understand what you need from us. To help us do this, we undertake a major industry consultation every three years to ask you - our members - what you need from science and technology. We then use this information to shape our £2 million annual member-funded research programme.

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We develop proposals for research projects across six strategic themes: safety, quality and value, nutrition and health, resilience and efficiency, environmental sustainability, and skills and knowledge.

This month we will be asking your company to vote on which new projects you want us to do. Voting closes on 14 October. The successful projects will then be steered by our members via our Member Interest Groups (MIGs). You can find out more about our new member-funded research proposals through the document circulated to voting members and the autumn round of MIGs. If you want to find out who your voting members are, please contact migs@campdenbri.co.uk.

Steven Walker, Director General

Scientific paper most downloaded

A scientific paper that we co-authored last year as part of an International Life Sciences Institute project was published in the Journal of Food Protection. *Low-Water Activity Foods: Increased Concern as Vehicles of Foodborne Pathogens* was declared the Journal's "Most Downloaded Journal Article of 2015". The award was presented at the International Association for Food Protection meeting in St Louis. Roy Betts, Head of Microbiology was there with the other authors to receive it.

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Vitamin D: our role in government advice

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A recent report from SACN has suggested that people should consider taking vitamin D supplements in autumn and winter, as they are unlikely to reach the recommended intake levels from a normal diet and natural sunlight during these months. This followed a BBSRC-funded intervention study into the effectiveness of ergocalciferol (vitamin D2) and cholecalciferol (vitamin D3) food fortification in raising vitamin D status in Caucasian and Asian women.

We were involved in the study design and used our pilot plant facilities to manufacture biscuits and orange juice for use in the intervention trials, which took place from November to April in 2011/12 and 2012/13. We also provided analytical support in the measurement of vitamin D levels in the foods.

Both forms of the vitamin elevated vitamin D levels, but D3 was more effective. The form in which it was taken (biscuit or orange juice) had no effect, and similar effects were seen in the two ethnic groups.

Latest on the website

Training matters - future of training

Blog by Bertrand Emond

www.campdenbri.co.uk/blogs/campdenbri-blogs.php

Meat snacks product development

Blog by Liz Mulvey

www.campdenbri.co.uk/blogs/campdenbri-blogs.php

The challenge of NPD

Blog by Alan Campbell

www.campdenbri.co.uk/blogs/campdenbri-blogs.php



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www.campdenbri.co.uk/research/quality-safety-cereal-ingredients.php

The ongoing 'cereals methods' project establishes and maintains relevant test methods for the cereals and cereal applications industries. Over the past 3 years, it has:

- developed a reliable method to measure Ergot sclerotia
- examined international and standard methods
- discussed developments in methods for β -glucanase, β -limit dextrinase and α -amylase activity, and methods for the determination of allergens
- reviewed various CCAT methods, including those for ascorbic acid in flour; ash in cereal products; determination of starch damage using Farrand reagents; determination of Falling Number; determination of moisture content by oven drying; determinations of SDS Sedimentation Volume, and determination of α -amylase activity

Work has been carried out on the method to determine water absorption and the mixing properties of dough (CCAT method No 4) to allow use of different instruments and the most up-to-date technology. An updated version of the method has been issued. The project has also seen the assessment of instruments such as the micro-doughLab for white flour and ground wheat samples.

This year, work is being undertaken on dough resistance/ extensibility, and a breadcrumb resilience method. In the latter, the aim is to measure breadcrumb resilience and method performance over a 7-day period.



Meat quality testing

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www.campdenbri.co.uk/services/meat-poultry-industry.php

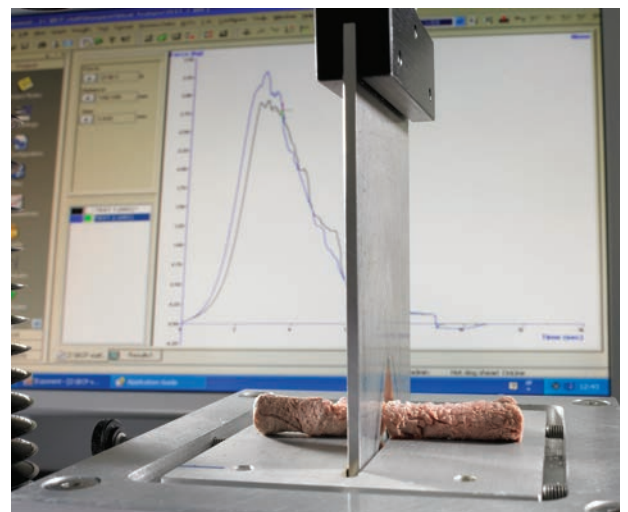
Meat testing involves assessing quality, safety, performance and compliance with prescribed standards and legislation. When a quality assurance programme is developed, all factors that affect quality must be identified and controlled.

Most routine testing measures physical, chemical and microbiological parameters and sensory attributes. Physical parameters include temperature, acidity (pH), water activity (Aw), water binding capacity, light intensity and texture. An important temperature measurement is the cooling rate of the carcass post-slaughter; if the muscle is cooled too quickly early in the post-mortem conversion of glycogen to lactic acid, this may lead to 'cold shortening' and tough eating meat. Carcass hygiene, meat colour, bone-taint and in-pack drip may also be affected.

Electronic temperature measurement with digital probes is most commonly used, although non-contact measurement such as infra-red, which measures the surface temperature, is useful for screening and the measurement of oven temperatures.

pH

The pH of meat is a measurement of acidity and is key in the conversion of muscle to meat. During early post-mortem changes, the pH of muscle falls from around 7.0-7.2 to a value known as the 'ultimate pH', which can depend on the species, muscle type and stress during the pre-slaughter period. Variation in ultimate pH influences factors such as colour and the ability of the meat to retain water; drip loss testing may be used as a quality indicator. A low ultimate pH results in meat proteins having decreased water-holding capacity and a lighter colour; this can have consequences for uptake and retention of added water during further processing.





Meat packaging

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Water availability

Measurement of the amount of free water available for the growth of microorganisms is a useful predictor of growth of bacteria, yeasts and moulds. *Aw* testing is important in products like biltong, which are made safe by lowering *Aw* to a value that will not allow dangerous pathogens to grow or where it is part of a series of hurdles for product safety.

Quality measurements

Tenderness, toughness, springiness and firmness are all used to describe meat quality and these can be measured objectively, for example using shear force for firmness or toughness of meat, and compression for properties such as hardness, springiness and stickiness. Advice should be sought from experts, so that the correct test is chosen to give the most meaningful results.

Consumers associate meat colour with sensory properties and freshness, so it is important that meat colour matches their expectations. However, meat colour is influenced by many factors, including pigment content, ante- and post-mortem conditions and the form and type of storage. We use a digital imaging system which accurately and reliably captures the colour of the meat.

Packaging is particularly important for meat and meat products. Raw and cooked meats are commonly sold in tray and lidding formats, usually packed in a modified atmosphere combination of oxygen, carbon dioxide and nitrogen. Correct combination of gases can extend microbiological shelf life and appearance of the product.

High oxygen MAP promotes the bright colour of raw red meat (oxymyoglobin) but may have an effect on eating quality. *Low oxygen MAP*, typically used with cooked meat products, replaces oxygen within the pack, most commonly with carbon dioxide, which inhibits growth of some bacteria and moulds, and nitrogen, an inert filler gas which prevents pack collapse.

The recent revival of vacuum skin packing (VSP) involves sealing the product between a base film, coated card or preformed tray and a heat softened top film, which is vacuum drawn onto the top of the meat surface to give a skin type pack. Retailers and manufacturers are increasingly opting for this packaging format in an effort to extend shelf life and reduce supply chain waste. This gives an attractive presentation of the product, a reduction in drip loss and easy open options.

To maintain quality of the product, barrier properties need to be adequate to prevent oxygen ingress. Any stretching over the product may thin the top film and affect the barrier properties and strength of the material. Measuring the barrier properties following packing is advised.



Events

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Training courses

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

October events

- 4-6 Bread science and technology
- 4 HACCP - refresher
- 4 New product development
- 5-6 Food technology for non food technologists
- 5-6 Threat Assessment Critical Control Point (TACCP) - intermediate level
- 6 Weights and measures
- 10-14 FSSC 22000 Auditor/Lead auditor course
- 11 Bread - practical skills
- 11-13 Brewing - an introduction
- 11 Safe cooking: process validation
- 12 Sensory evaluation - discrimination testing
- 18 Cake - practical skills
- 18-19 Food and drink labelling
- 18-19 HACCP - intermediate (level 3)
- 18-20 Practical microbiology - advanced
- 20 Raw material risk assessment
- 27 Food allergen labelling seminar
- 31-4 Nov HACCP - advanced (level 4)

Hot Topics in microbiology: conference 13-14 October

www.campdenbri.co.uk/microbiology-hot-topics.php

Keep in touch with current and future microbiological issues affecting the safe production of food.

This conference will look at major points of concern and will include the following: *Listeria*; The role of the AWW9 (British Standards Institution) Committee; The effect of salt reduction on the growth of spoilage bacteria; Whole genome sequencing and its application to food microorganism testing; Pathogenic *Escherichia coli*; Sensitive detection of *Campylobacter jejuni*; *Staphylococcus aureus*; Viruses, and US Food Safety Modernization Act

Food allergen labelling seminar

27 October

www.campdenbri.co.uk/allergen-labelling.php

This seminar will focus on how to make sure you are providing accurate allergen information and are not involved in the next product recall or media frenzy due to incorrect or missing allergen information.

www.campdenbri.co.uk/training.php

Member zone

www.campdenbri.co.uk/memberzone.php

to access privileged member information and services

Your vote will count!

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Your membership fees fund our Research Programme, and each year, we put forward a range of projects for you to vote on. Electronic voting forms, along with a document detailing the background and intentions of each of the proposals, are currently being sent out to all voting contacts. If you are a voting representative in your company, please make sure you vote. If you aren't, and would like to know who is, then please get in touch.

Emerging ingredients: R&D Reports

www.campdenbri.co.uk/research/report2016.php

Two research reports have just been published as part of a new member-funded research project: Emerging ingredients - considerations for use in products.

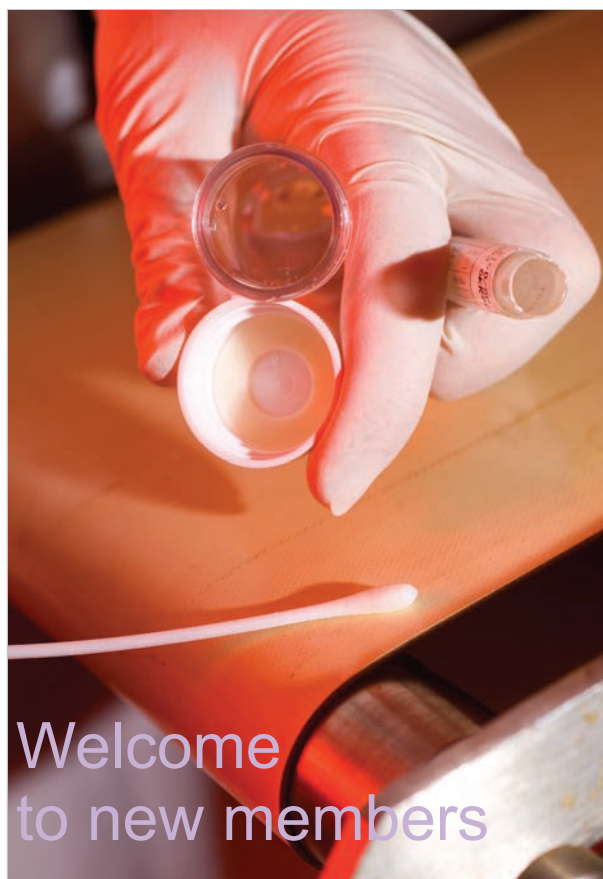
A summary of changes to the regulation of novel foods (RD408) explains some key aspects of the new EU Regulation including: scope of novel foods legislation, authorisation procedure and proprietary claims to support authorisations, and evidence to define when foods are novel.

Ancient grains: literature review (RD409) highlights some of the nutritional and compositional information available in the literature, as well as assessing quality, variability and applicability of underutilised grains for application in the food industry.

MIGs - dates for 2017 published

See the webpage:

www.campdenbri.co.uk/research/paneldates.php



Welcome to new members

We are delighted to welcome the following new members:

- AECOM - engineering consultancy
- Aryzta Bakeries UK & Ireland - manufacturer of bread buns
- Bunge Group - agrifood operations from farm to retail
- Cambridge Commodities - distributor of ingredients for health foods
- Chelmer Foods Ltd - importer of dried fruits, edible nuts, seeds and pulses
- Excelsior Technologies Ltd - flexible packaging manufacturer
- Fairway GB - grocery distributor
- Fentimans Ltd - manufacturer of soft drinks
- Halewood Wines & Spirits - manufacturer of alcoholic and non-alcoholic drinks
- Ikoyi Chapmans Ltd - soft drink producer
- McCalls Gluten Free Foods - producer of GF savoury snacks
- Mrs Unis Spicy Foods Ltd - manufacturer of savoury Indian snacks
- Oakham Ales - brewery
- Palintest Ltd - producer of water analysis technologies
- Rare Tea Company Ltd - soft and alcoholic drink manufacturer
- Ringtons Ltd - tea importer and blender
- The Tomato Stall - producer of tomatoes and tomato products
- Thyme Food UK Ltd - frozen food start up business
- Verdesian Life Sciences Europe Ltd - producer of crop nutrition products
- Yumsh Snacks Ltd - manufacturer of GF pop corn and crisps

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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.



Jacob Altman



James Huscroft



Rebecca Weeks



Flora Challou

Supporting students

The food and drink industry relies on getting the right people with the right skills to maintain its knowledge base. We have supported the industry in this for many years. To help attract young talent and raise awareness of the food industry as a career option for scientists and technologists, we launched Ecotrophelia UK in conjunction with the Institute of Food Science and Technology.

We also regularly support university students on industrial placements and studentships, and are delighted that three placement students that we employed during 2014-15 (Jacob Altman, James Huscroft and Rebecca Weeks) have all graduated with upper second class honours degrees this summer. We also congratulate Dr. Flora Challou who received her doctorate from the University of Birmingham this year. Flora worked with our processing specialists on her PhD: *Surface Pasteurisation of Food Packages by the Inversion Method* before joining us full time.

Now, in conjunction with the Institute of Food Technologists (IFT), we have launched "*The Thesis Video Challenge*" - a new competition offering food technology post-graduate students around the world the chance to win an exchange programme. To enter, students submitted a video related to original research they were conducting. This year's winner Amadeus Driando Ahnan, a PhD Student at University of Massachusetts Amherst, will spend 10 days here and experience each of our divisions, focusing on the areas most relevant to his study.

Pizza dough press

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Thin bread products are a convenient way to include fibre in bread as there is less of a need to generate an aerated structure. Hence pizza bases, wraps and thins have potential to address the need to include more fibre in the diet.

We have a new heated pizza press, which will further improve our ability to deliver pressed dough products, including pizza bases of varying thickness, and also tortillas and flat breads.

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For other sites, see
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