The history of cheese

The UK Society of Dairy Technology’s Summer Symposium was held before the ICA in Nantwich. Ralph Early reports

Bruce Macdonald, founder of the Guild of Cheese Graders, spoke on the topic of taste acuity. Credit: R Early

SDT Summer Symposium

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he Society of Dairy Technology’s Summer Symposium was held 29 July 2019 at the Civic Hall, Nantwich, Cheshire, to precede the Society’s annual dinner, which took place at the hall during the evening. The symposium, which had a mainly cheese theme, was opened by Paul Bouchier, president of the Society, who welcomed the delegates and introduced each of the speakers in turn.

The first speaker, Jonathan Goodwins, senior applications specialist with DuPont Nutrition and Health, discussed “Enhancing Flavour Through Diversity.” His presentation considered ways in which cheese flavour can be enhanced, defining enhancement as: (1) faster development of flavour; (2) creation of more intense flavours; and (3) increasing the diversity of flavours. His presentation concerned mainly cheddar cheese production, not because of its significance worldwide, but because the principles that apply to cheddar are transferable to most other cheeses. Goodwins explained that the key factors driving change in the dairy marketplace are: product diversity and novelty, stating that the more consumers experience diversity the more they want; naturalness, eg, organic and functional nutrients such as calcium; ‘snackification’ and convenience; and free-from, with features such as clean label and low salt.

Of all food marketplaces, the German marketplace is the one with the greatest demand for variety and novelty. In relation to cheese, flavour is key to meeting consumers’ requirements. Goodwins explained that many cheese makers solve the problem of improving flavour by simply “lobbing in the Helveticus.” Some strains of Lactococcus spp. in cheese starters, or as non-starter lactic acid bacteria (NSLAB), can produce bitter peptides during casein proteolysis and catabolism, resulting in unacceptable flavour profiles. Such defects can cause significant financial losses for cheese makers. However, Lactobacillus helveticus can be used to reduce peptides to free amino acids, thereby modifying flavour and reducing any bitterness.

In Swiss-type cheeses, Helveticus liberates peptides that promote Propionibacterium spp., so enhancing flavour. Other approaches to flavour modification include the use of Penicillium candidum and Geotrichum candidum in surface ripened cheese to reduce bitterness, mushroom notes and ammonia, as well as combinations of Pediococci spp. and Lactobacillus delbrueckii to degrade bitter peptides in other cheese types. Goodwins explained that flavour development in cheddar is based mainly on five factors: time (six months for a medium/mature cheese), temperature (8°C min.), pH (optimum 4.9 to 5.4), microbial species (wild or adjunct cultures) and population diversity.

He explained that while modern cheese making uses selected bacteria to influence flavour development, traditionally bacterial strains specific to local cheese making environments were responsible for creating characteristic flavours. He went on to explain that the future “is ‘omics shaped” and that the sciences involved in genomics, transcriptomics, proteomics, etc., will bring greater understanding of how microorganisms affect cheese flavour and of the ways blends of microorganisms can be developed to deliver specific flavour profiles quickly and efficiently.

The guilds

Bruce Macdonald, founder of the Guild of Cheese Graders, spoke on the topic of taste acuity, which is actually something that ought to give the CEOs of cheese businesses sleepless nights. Macdonald explained that while there are countless individuals across the dairy industry making judgements about cheeses, some will be unable to give objective responses for genetic reasons and most will not have been tested for suitability, let alone trained to fulfil the task reproducibly.

Given the value of the cheese industry worldwide, it is perhaps surprising that something as important as cheese grading is not more highly regulated through formal assessment and training procedures. Macdonald explained that taste acuity concerns the ability to recognise and identify a range of flavours including sweet, sour, salt, Umami and bitter. He described the functions of the tongue and olfactory bulb in the organoleptic assessment of foodstuffs, explaining that while
smell is detected by the olfactory system, bitterness can only be detected by the tongue. Interestingly, he drew attention to the fact that established understanding of the parts of the tongue responsible for different taste perceptions has been confirmed as incorrect.

Macdonald highlighted the fact that bitterness and acidity are commonly mistaken for each other, while some people are genetically blind to bitterness and cannot detect it. This would limit their value as cheese graders. Interestingly, research has shown that of 441 people tested in England, 31.5 per cent were bitter blind. Macdonald detailed the many factors affecting taste sensitivity, such as age, diet, general health, oral health, hunger, etc, and explained how taste acuity can be assessed through taste screening according to methods defined by British and international standards. The key message from Macdonald’s presentation is that those employed as cheese graders ought to be assessed to confirm ability to grade cheese and properly trained for the role.

**Cheese evolution**

The third speaker of the day was Nigel White, formerly an economist with the British Milk Marketing Board (MBB) and secretary of the Stilton Cheesemakers’ Association and the British Cheese Board. He gave an overview of the evolution of the British cheese industry. Cheese making itself has a long history in Britain predating the Romans and influences such as the migration of peoples from Europe as well as invasions, eg, the Vikings.

With the expansion of the monasteries during the Middle Ages, dairying was reinforced as a part of the nation’s food system and cheese became a staple for monks on meat-free days. Only scant references to early cheese making exist, but it is known that most cheese was eaten locally, although historically Cheshire cheese was most commonly consumed and cheese was taken from Suffolk to London. The Agricultural Revolution during the 18th and 19th centuries improved efficiency and increased the yields from dairying, eg, through the use of winter fodder, and as the Industrial Revolution gathered pace the demand for cheese by urban populations increased.

In the early 19th century, Britain was around 90 per cent self-sufficient in cheese, but the Repeal of the Corn Laws in 1846 caused the agricultural sector to collapse. This opened the British market to imports of cheaper US cheese, which displaced domestic production. In 1860 Britain imported 25,000 tons of cheese, but this grew to 43,000 tons by 1874. British cheese factories were small and inefficient and could not compete with the US on quality and price, so most milk was diverted for liquid consumption. By 1900, domestic cheese production commanded only 22.5 per cent of the market.

Government food policy in the early 20th century was based on three principles: cheap food with priority for consumers and tax payers over agriculture, free-trade, and Empire preference. The laissez faire policy contributed to a world depression in agriculture, which led to the formation of the British Milk Marketing Boards (MMBs) in 1933. The intention was to increase milk production and sales, with positive outcomes for public nutrition and health, as well as to provide farms with a guaranteed buyer for milk. Consequently, many farms ceased cheese making and simply sold their milk. Farm production of cheese collapsed and imports increased.

With the advent of World War II the government took control of all food and milk was diverted to the industrial production of a cheddar-type cheese. Farm-scale production virtually ceased and from 1942 supplies from the USA increased with the food aid convoys. At the end of WWII Britain was producing some 22,500 tons cheese per annum and importing around 198,000 tons. The post-war focus on food security meant that by the 1960s domestic production had increased to around 103,000 tons, with imports falling to 145,000 tons.

With Britain joining the EEC in 1973, laissez faire ceased. Agriculture was highly regulated and supported by taxpayer subsidy. The UK marketplace was opened to EEC countries and cheap, mild cheddar became the dominant product. Oil prices and the weakness of sterling constrained the development of the dairy industry in the 1970s and just as it began to expand, milk quotas were imposed in 1984.

The loss of the MMBs in the early 1990s saw structural changes in the sector and although the industry has responded with the development of high quality branded cheddars as well as significant growth in the artisan cheese sector, the UK’s share of the national cheese market is now below 40 per cent.

The symposium’s final speaker was Niels Osterland of the Danish Society of Dairy Technology (DSDT) who provided an overview of the Society and outlined the Nordic Dairy Technology Council’s plans for the Nordic Dairy Congress, due to take place in Oslo in 2020. The role of the DSDT is similar to that of the SDT. Its main activities are: organising seminars and a general assembly, co-organising a Nordic dairy research conference, the Nordic Dairy Congress and study tours. The Danish society has 360 members as well as 32 company sponsors contributing variable sponsorship fees according to grade: Gold, Silver and Bronze. The SDT is now a member of the organising committee of the Nordic Dairy Congress.

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**Niels Osterland of the Danish Society of Dairy Technology outlined the Nordic Dairy Technology Council’s plans for the Nordic Dairy Congress in 2020. Credit: R Early**

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