

Time for buttermilk

Buttermilk is getting a longer look in 2019's second issue of the *International Journal of Dairy Technology*, Andrew Wilbey reports

The second issue of this year's *International Journal of Dairy Technology* contains two reviews and 13 reports of original research. The first review covers the current knowledge of buttermilk, a by-product of butter making that has now found increasing applications both as an ingredient in its own right and as a source of the milkfat globule membrane and its associated proteins and polar lipids.

The inulin addition to yogurt is the topic of the second review, covering nutritional implications, physiochemical effects, prebiotic activity and sensory effects.

Yogurt and fermented milks

Fortification of yogurt with each of a series of four vegetable fibres resulted in higher starter counts. This was associated with greater metabolic activity and changes to the texture and sensory properties. In a separate report, the addition of saffron to yogurt was associated with changes in colour, odour, texture and bacterial numbers.

Fortification of reduced-fat yogurt with iron salts, short and long chain inulins had no effect on counts of the primary starter organisms but slightly increased counts of *Bifidobacterium animalis subsp. lactis*. Addition of iron and inulin affected texture but not flavour, while calcium bioavailability was reduced.

Experimental fermentations of caprine milk with four probiotic monocultures were subjected to sensory and microbial analysis on storage for up to 14 days. Cell populations were similar for the first seven days. Sensory evaluation put *Lactobacillus plantarum* 020 as producing the best fermented milk.

Milk was partially replaced by a chickpea extract in yogurt-type beverages, all

exhibiting typical non-Newtonian behaviour. The product with 30% substitution by the chickpea extract achieved the highest acceptance.

Cheese

Tulum cheese is typically produced from ovine milk to give a semi-hard and easily crumbled product. Experiments with adding probiotic cultures suggested that addition of *Lactobacillus acidophilus* was associated with the highest texture and acceptability ratings.

Some soft cheeses, particularly soft unripened cheeses such as the Mexican Panela cheese, are susceptible to microbial contamination. Nisin, a natural bacteriocin has been used to inhibit spore germination and is also active against *Listeria monocytogenes*. Where nisin is permitted, then measurement of residues is usually required and this report covers a modification of the British Standard method to give faster results from a 0.2g sample.

The formation of a stable curd in acid fresh cheese was studied using low resolution nuclear magnetic resonance. During texture building, there was a significant decrease in water mobility, whereas forced syneresis using multistep centrifugation resulted in an inverse shape to the mobility curve, suggesting that optimisation of the processing steps is critical in avoiding subsequent syneresis.

Dairy microbiology

Contamination of animal feed by *Aspergillus spp.* can lead to the production of aflatoxins, which may subsequently be excreted in the milk. Small-scale reaction of an aflatoxin-contaminated milk with a *Lactobacillus rhamnosus* GG biofilm led to binding of up to 60% of the aflatoxin.



Kefir is viewed by many as a probiotic drink conferring health benefits, some of which may be associated with the many species of yeast in the cultures. An investigation of two yeast species, *Kluyveromyces marxianus* and *Saccharomyces unisporus*, demonstrated that not one of the isolates exhibited N-acetylglucosaminidase activity, characteristic of resistance to host immune systems, nor had proteolytic or haemolytic activities. While *S. unisporus* isolates were resistant to the antifungal agent fluconazole, *K. marxianus* strains were susceptible.

There is an ongoing interest in finding new strains of *Lactococcus lactis* for use in cheese cultures. Cell-free extracts from 157 strains isolated from artisanal cheeses were classified into groups using electrophoresis. The acidifying characteristics of sample strains were then investigated to build a correlation between acidification and electrophoretic properties.

The presence of heat-resistant spores such as *Geobacillus stearothermophilus* can be a threat to otherwise shelf-stable foods such as UHT milks. The ISO test for such spores (ISO/TS27265:2009) is quite demanding and its methodology was tested against an alternative, with heating to 106°C for 30 minutes replaced by treatment at 100°C for the same time. This had the same predictive value providing the count specification was raised by one order for the latter and TSA replaced PCMA as the cultivation medium, as the former can provide a higher recovery of spores. **Dii**