The first issue of this year’s International Journal of Dairy Technology (Volume 71) is a bumper issue, including 31 original research reports, plus a review of immunomodulation by hydrolysates and peptides derived from milk proteins. Immunomodulation has potential health benefits and peptides derived from both casein and whey proteins display bioactivity, though most activity is attributed to the peptides from casein. This suggests the potential for milk proteins as functional foods.

Yogurt
Production of Greek-style yogurt involves straining the fermented milk, leading to the production of acid whey as a by-product of little economic value. Partial and full pre-concentration of the milk base was compared to straining in a cloth bag, all yogurts finishing at 23 per cent total solids. Full pre-concentration gave the softest product with the greatest syneresis, while partial pre-concentration followed by reduced straining gave the firmest product with least syneresis, with 78 per cent less acid whey production than from the traditional process.

A comparison of six commercial yogurt starters in caprine milk showed varying rates of acidification, post-acidification on storage, texture and visual properties. This underlined the importance of starter selection in achieving the desired sensory properties in yogurt.

Fortification of yogurt with pullulan, a linear polysaccharide produced by a yeast, was found to weaken the gel network when added at one per cent. Increasing the addition to two per cent increased gel firmness and adhesiveness and lowered syneresis, though firmness and susceptibility to syneresis did increase on storage.

The conversion of milk to yogurt can be influenced by the choice of starter culture, inoculation rate and temperature. Changes in viscosity were noticeable before changes in particle size as measured by dynamic light scattering. Raman infra-red spectroscopy was suggested for monitoring exopolysaccharide synthesis.

Sweetened yogurt is desired for some market sectors, but sometimes the sucrose addition is not wanted. Trials with the intense sweeteners aspartame and neotame indicated that neotame was the more stable in heat treatment, though both sweeteners were stable on subsequent storage of the yogurts.

A blend of yogurt with pumpkin puree was found to give 4.5 per cent fibre while raising the levels of the antioxidants vitamin C and β-carotene to 8.5 and 8.9 mg/100g, respectively. The viscosity was slightly lower at higher shear rates. In a separate report, encapsulated grape seed extract was added to yogurt, giving a threefold increase in total phenolic content and a fourfold increase in antioxidant capacity, without affecting the viability of the starter culture. Sensory properties were better than for a non-encapsulated extract. A further report illustrated the contribution of fruit flavourings to mineral micronutrients in the diet.

Fermented milks
Camels’ milk was fermented using starters based on either Lactobacillus acidophilus and Streptococcus thermophilus (S1) or Lactobacillus helveticus and Streptococcus thermophilus (S2). The SI fermented milk’s greater angiotensin converting enzyme (ACE) inhibitory activity and antimicrobial activities against Bacillus cereus, Salmonella typhimurium or Staphylococcus aureus were apparent throughout 15 days of storage, whereas no antimicrobial effects were noted for unfermented milk. In a separate report, lactic cultures were used in combination with kefir grains to produce a series of kefirs whose ACE-inhibitory properties were variable during the 28-day storage period.

Conjugated linoleic acids (CLA), present as minor components in milk fat, are now recognised as having strong health-promoting effects. A strain of Lactobacillus fermentum was used in optimisation of bioconversion of linoleic acid...
In a previous paper, we described how the use of microorganisms to produce bioactive compounds from food ingredients can be a powerful tool in the development of functional foods. This article will focus on the use of probiotics as a means of producing specific bioactive compounds.
Microbiology of milk products

A review of 91 commercial Brazilian UHT milk samples identified 46 spore-forming bacterial species. Sporulated bacteria were identified as four species of bacilli, with 31 per cent exhibiting proteolytic activity and 33 per cent with lipolytic activity. Almost half of the brands had counts in excess of 100 cfu/mL, suggesting potential for spoilage during the commercial shelf life.

Cronobacter species have been identified as opportunistic pathogens that can be a threat to neonates and infants. Detection may be more difficult in powdered infant formulae. A combination of real-time PCR and high resolution melting analysis was shown to be able to detect two desiccated Cronobacter species at two cfu/25g after four weeks storage at room temperature.

A survey of raw milk in Inner Mongolia indicated that over a third of samples contained Bacillus cereus, with a higher occurrence in summer, particularly in milk from small to medium-sized herds.

Other products

Conjugation of whey protein isolate (WPI) with an equal mass of maltodextrin was achieved by dry heating at 60°C and 70 per cent relative humidity for up to 24 hours. The resulting product had limited colour development and increased solubility at pH 4.5 compared to the heated and heated WPI controls. The conjugated product also displayed enhanced stability and clarity in solutions with 50 mM added salt when heated to 85°C for 10 minutes.

Heat treatment of milk can bring about denaturation of whey proteins, which can either self-aggregate or become complexed with casein micelles. These can alter the properties of milk and milk products. A study was made of the effects of heat treatment for 10 minutes at 80°C and 90°C on reconstituted low-heat skim milk, standardised to different pH values. Correlation was found between casein micelle size and bound whey protein.