

## High Pressure Homogenisation Affects Probiotic Viability in Full Fat Yogurt

Anthony Hobden, Thulani Sibanda, Elna Buys

University of Pretoria, Pretoria, South Africa

### Abstract

**Introduction:** Probiotics are live microorganisms which when administered in adequate amounts confer a health benefit to the host. The ingestion of sufficient numbers of viable probiotics in foods is associated with many health benefits such as alleviating symptoms of lactose intolerance, anti-carcinogenic effects, immune modulation, anti-infection properties, and others. Yogurt is an excellent probiotic carrier because of its widespread consumption by people of different age groups. Nevertheless, the incorporation of probiotics in yogurt and the sustenance of viability over the shelf-life period remain a challenge. Yogurt processing technologies and processing conditions can influence probiotic viability. The aim of this study was to investigate the potential use of high-pressure homogenisation as a technology for improving the viability of *Lactocaseibacillus rhamnosus*, *Bifidobacterium animalis* subsp *lactis*, and *Bifidobacterium animalis* subsp *animalis* in full fat yogurts.

**Methodology:** Standardised full fat milk (4% fat) was subjected to homogenisation over two stages at 20 MPa (60°C), 25 MPa (60°C), 60 MPa (40°C), and 60 MPa (60°C). Confocal laser microscopy and X-ray diffraction analysis were used to analyse the effect of varying pressure on milk structure. Homogenised milk samples were subsequently used to prepare yogurt samples in which probiotic cultures, *Lactocaseibacillus rhamnosus* GG, *Bifidobacterium animalis* subsp. *lactis* BB12, and *Bifidobacterium animalis* subsp *animalis* were incorporated at  $10^8$ –  $10^9$  CFU/g at the onset of fermentation. Probiotic viability was monitored over a 28-day shelf life. The effect of varying pressure on the yogurt ultrastructure, physico-chemical properties (redox potential, texture analyses, pH and titratable acidity and degree of syneresis) and probiotic viability were investigated.

**Results and Conclusions:** Experiments on the homogenisation treatments are in progress and the study expects to elucidate the effects of high-pressure homogenisation on milk structure and the attendant effects on yogurt properties and probiotic viability.