

Effect of High-Pressure Processing (HPP) on composition, lactose and microstructure of goat milk

ABSTRACT

Thermal pasteurisation is an established method for milk processing. However, the high temperature could affect the micronutrients in the milk. High pressure processing (HPP) is a cold alternative to thermal pasteurisation that can maintain the fresh-like properties of liquid food. However, employing pressure could potentially affect the composition and microstructure of milk and milk products. Therefore, this study focusses on evaluating the effect of high pressure processing (HPP) towards the composition, lactose content and microstructure (in term of fat globules) of goat milk. The goat milk was subjected to HPP at a pressure range of 200 to 600 MPa and process holding time at 5 - 15 mins. There were insignificant differences in terms of fat, protein and carbohydrate, but significant changes observed for lactose content of pressurised goat milk (PGM). The lactose content of PGM was in the range of (2.540 – 2.986 g/mL), while 1.253 ± 0.01 g/100 mL for untreated goat milk (UGM). A higher number of the small size of goat milk fat globules observed at 600 MPa compared to lower processing pressure (200 and 400 MPa) at the same pressure holding time (5 to 15 mins). The mean diameters of fat globules were in the range of 5.215 to 5.651 μm . This size reduction of milk fat globules is an advantage for cheese making or other dairy product making industries, because it can help to possess a smoother and more refined texture of milk products.

Keyword: Fat globule; Goat milk; High pressure processing; Lactose; Microstructure