
Stabilization of functional goat milk by using high pressure processing

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Fish oil are the richest sources of long chain polyunsaturated fatty acids especially omega 3 PUFA. Fortification fish oil into various foods is an innovative choice of elevating the intake of omega-3 fatty acids without changes in eating habits. However, adding lipids such as omega 3 PUFA into food products gives rise to major formulation challenges. Oxidation of fatty acids is a major cause of food deterioration which effects on the properties of food such as aroma, flavor, color and shelf life. One way of reducing fatty acid oxidation of through lipid encapsulation. In addition, there is more incidents of children who allergy to protein in cow milk, thus goat milk is an alternative source. In this paper, functional goat milk was developed by incorporating fish oil emulsion and stabilized into complex carbohydrate system. The product was then processed under high pressure processing (HPP). The study selected goat milk that contained 0.04% Konjac glucomannan solution at pH 9-10 were mixed with 5% fish oil and homogenized. After that, mixtures were subjected to HPP at 400, 500 and 600 MPa. Stability of emulsion including particle size, PDI, zeta-potential, oxidative stability and microbial population count were determined. The results in this section were found that, increased pressure resulting in decreased particle size and PDI. However, pressure had no effect on zeta potential values. HPP improved emulsion stability compared to control from 10 days to 14 days. As for the oxidative stability, which was reported as hydroperoxides values (PV) and thiobarbituric acid values (TBARS), it was found that HPP led to increases in the PV and TBAR values of 5% fish oil emulsion made with 0.04 % KGM at pH 9 and 10, indicating that oxidation of the emulsions was promoted in the high-pressure conditions. For number of microorganisms, which the results showed that the pressure reduced the microbial load. The maximum reduction of microorganisms occurred at a pressure of 600 MPa.