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PhD Dissertation Defense

Entitled

*SOFT CAMEL MILK CHEESE
EFFECTS OF COAGULANTS AND PROCESSING CONDITIONS*

by

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Abstract

In recent years, camel milk (CM) has been acknowledged for several health benefits, including anti-diabetic, hypoallergic, and other effects. Accordingly, CM may provide a complementary or a healthier alternative to bovine milk (BM). This has led to increased interest in processing CM to products like cheese, yogurt, and powders to extend its shelf-life. However, CM is difficult to coagulate into hard gels, affecting its cheese quality and consumer preference. The current research aimed to investigate the impact of different coagulants (chymosin, *Withania coagulans*, citric and acetic acid) on CM cheese quality and sensory attributes compared to BM cheese. It also evaluated the effect of pasteurization temperatures (low-temperature long-time (LTLT) and high-temperature short-time (HTST) and high-pressure processing conditions (HPP, 350, 450, and 550 MPa) on the physical, chemical, and softness properties of CM cheese in comparison to BM cheese. Large variations were found between CM and BM milk concerning coagulation time, properties, and the microstructure of the cheeses. CM cheeses were observed to have smooth and continuous casein networks, thinner aggregate strands, and smaller pore spaces, as shown by scanning electron microscope (SEM). One important finding is that CM possesses higher proteolytic activities than BM, as demonstrated by SDS-PAGE protein/peptide analysis, which might contribute to the softness of its cheese. It was also found that HTST (75°C for the 30s) negatively affected the coagulation, especially of CM, while LTLT (65°C for 30 min) provided higher quality cheeses. HPP (450 to 550 MPa for 5 min) treatments resulted in soft cheese, while HPP (350 MPa) provided better cheese quality than HTST. Thus, HPP at low pressure may offer an alternative to conventional heat treatments in providing harder camel cheese. In conclusion, the selection of coagulants and processing conditions can be tailored to improve camel cheese quality, which opens new research avenues in this field.

Keywords: Camel Milk, Bovine Milk, Cheese, Coagulation, Chymosin, Pasteurization. High-Pressure Processing.