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Effects of Physical Ripening Conditions and Churning Temperature on the Butter-Making Process and the Physical Characteristics of Camel Milk Butter

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Abstract

Compared to cow milk fat, camel milk fat presents a particular fatty acid composition and microstructure. For this reason, the production of camel milk butter following the same technology as for cow milk butter could be challenging. Hence, the main objective of this study was to investigate the effects of ripening temperature (5 °C, 12 °C, and 21 °C) and duration (0 h and 24 h) as well as the churning temperature (5 °C, 12 °C, and 21 °C) on the churning process of camel milk cream and camel milk butter. Results of the current study indicated that camel milk butter was only obtained when churned at 21 °C, regardless of ripening temperature. Analysis of solid fat content and

polymorphism of camel cream before churning highlighted that the churning process for camel milk cream required the presence of β' 1 and β -forms and a solid fat content lower than 27.5%. Furthermore, changing the ripening conditions had no significant influence on the water content, the solid fat content, and the polymorphism of camel milk butter. Finally, the findings of this study showed that the ripening and the churning conditions strongly affected the melting properties and the rheological behavior of camel milk butter. The lowest elastic modulus and the lowest T_{pMMF} (melting temperature of medium fraction) were found for butter produced from cream ripened at 5 °C for 24 h.

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