5. Processing and physicochemical characterization of camel milk butter

Jared Gisore Mbeche[1,2], Alfred Mugambi Mariga[1], and Joshua Mbaabu Arimi[1,2*]

[1] Department of Food Science, Meru University of Science and Technology

[2]Center of excellence in Camel research, Meru University of Science and Technology

Corresponding author email: jarimi@must.ac.ke

Subtheme: Agriculture - Sustainable Agro-ecological practices for climate resilience

Abstract

Camels are usually reared in the arid and semi-arid areas (ASALs) of Kenya. They are used for transport and also produce milk and meat which forms part of subsistence. Camel milk fat contains higher amounts of unsaturated fatty acids compared to bovine milk. This makes it unique. Kenya is the largest producer of camel milk in the world. However, there is no camel milk butter (CMB) in the market. This is attributed to the fact that camel milk has unique fat properties. These include; tiny fat globules with thick membranes which are strongly attached to the proteins. Also, there is the presence of long chain fatty acids, making it difficult to use the same technology as bovine milk in the making of camel milk butter. Camel milk has a high melting temperature ranging from 41-44 °C making it hard to process CMB at normal conditions as bovine milk. In addition, the milk fat has a high melting point, making it hard to process camel milk butter at normal conditions as bovine milk butter. Therefore, the main aim of this study was to process and analyze the physicochemical properties of CMB. Consequently, butter was prepared using camel milk obtained from Isiolo and Laikipia counties. It was produced by churning aged cream at 21, 23, 25 and 27 °C monitoring the time taken for butter formation. Subsequently, the butter obtained was analyzed for proximate and physicochemical properties. Results indicated that butter churned at 23 °C formed butter within 10 minutes and had the highest yield compared to 25 and 27 °C. The fat, moisture, protein, ash and solid-non-fat content was 86.5, 11.6, 0.86, 0.64 and 1.55% respectively. Additionally, the iodine, peroxide, saponification and acid values were 46.6 microMol/L, 0.15 meq/Kg fat, 201 mgKOH/g and 5.4 mgKOH/g respectively. There were no notable differences in terms of physicochemical properties between the different churning temperatures. Acid and peroxide values increased significantly indicating increased rancidity of butter. Churning of the cream at 23 °C produced the best results within 10 minutes of churning and a considerably higher output yield. Thus, the temperature-time regime is ideal for camel milk butter production.

Key words: *Camel milk butter, Value addition, Optimization, churning, ASALs*