Buttermaking from Camel Milk by blending it with Goat Milk and Analysis of its Quality

Aleme Asres¹ --- Eyassu Seifu² --- Mohammed Y. Kurtu³

¹Department of Animal Production and Technology, Adigrat University, Ethiopia
²Department of Food Science and Technology, Botswana University, Botswana
³School of Animal and Range Sciences, Haramaya University, Ethiopia

Abstract

The study was conducted to evaluate the efficiency of buttermaking from camel milk by blending it with goat milk, the physicochemical properties and microbiological qualities of butter made alone and at different blending levels were assessed. The experiment was laid out in completely randomized design with five treatments, i.e., T1 (100% camel milk), T2 (75% camel and 25% goat milk), T3 (50% camel and 50% goat milk), T4 (25% camel and 75% goat milk) and T5 (100% goat milk). The milk samples were analyzed for their physicochemical properties and microbiological quality. The fat, total solids and titratable acidity of T1 was significantly (P<0.001) lower than T5 but T1 had significantly (P<0.001) higher pH value than T3, T4 and T5. There was no significant (P>0.001) difference in specific gravity between T1, T2, T3, T4 and T5. The total bacteria count (TBC) of T1 was significantly (P<0.001) higher than TBC of T2, T3, T4 and T5. The coliform count (CC) of T5 was significantly (P<0.001) higher than CC of the other milk samples and no significant (P>0.001) difference was observed in CC between T1, T2, T3 and T4. The churning efficiency, physicochemical properties and microbiological quality of the butter samples were analyzed following standard procedures. The fermentation time (11.3 days), churning time (121.7 min) and churning temperature (28°C) of T1 were significantly (P<0.001) higher than the other milk samples. However, T1 had significantly (P<0.001) lower churning pH (4.13) and butter yield (49.3 g/liter) than the other samples. T3 and T4 had significantly (P<0.001) higher butter yield than the other milk samples. The fermentation time, churning time and churning temperature of T5 were significantly (P<0.001) shorter/lower than the rest and T5 required significantly (P<0.001) higher churning pH than the other milk samples. The moisture content (39.2%), melting range (42.±1°C) and acid degree value (8.72% oleic acid) for T1 was significantly (P<0.001) higher than the other butter samples and T1 had significantly (P<0.001) lower fat content(56.8%) than the other samples. The coliform count (CC), Enterobacteriaceae count (EBC), lipolytic bacteria count (LBC) and yeast and mould count (YMC) of T1 was significantly (P<0.001) higher than the other butter samples. The CC, EC and total bacteria count (TBC) of T5 was significantly (P<0.001) higher than T2, T3 and T4 and it had significantly (P<0.001) lower TBC than the others. The results showed that blending camel milk with goat milk improved fermentation and churning time and yield of
butter from camel milk. Although butter can be made from pure camel milk, it took longer
churning time and fermentation time. Thus, research is needed in order to reduce the
churning time and improve the yield of butter made from pure camel milk by manipulating the
operating parameters viz., pH of the milk, churning temperature, method of churning and
volume of milk in the churn.

**Keywords:** Buttermaking, Camel milk, Churning, Goat milk.