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PHYSIOCHEMICAL AND SENSORY CHARACTERISTICS OF ICE CREAM FROM LASSI CAMEL MILK



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Abstract

Camel is even toed domestic species well adapted in hot climate regions, domesticated for milk, meat, and transport purpose. Now, it is well established dairy products (yoghurt, soft cheese, and butter) were processed from Camel milk. Herein, we processed ice cream from local Lassi Camel milk and further evaluated physicochemical and sensory characteristics at day-0 and day-30. Camel milk of Lassi breed, skim milk powder and cream were mixed for standardization, and ice cream was processed according to established method. Samples were collected on day-0 and day-30 for further evaluation. Day-0 vs. day-30, total solids increased, and acidity was decreased after storing the ice cream for long period ($P < 0.05$), while storage condition non significantly affected the fat and pH. Texture, flavor, and color of ice cream non-significantly declined after long term storage. In conclusion, prolong storage period produced impact on total solids and acidity of ice cream, and did not alter sensory characteristics. This preliminary study can be guidance to local community and industry for production of ice cream which will contribute to economy.

Keywords: Ice cream, Lassi Camel, Physicochemical, Sensory

INTRODUCTION

The Camel is even-footed livestock species of desert and hot climate regions. This unique animal is domesticated for meat, milk production transportation, physical labor, textile, and recreation (1). It is well established that milk from camel consumed as fresh or in sour form, due to different chemical composition not processed for dairy products commercially. The Lassi Camel domesticated for multi-purpose milk, meat, as well for transportation. This camel uniquely found in coastal areas of Baluchistan and Sindh provinces and having adaptation potential in desert coastal environments (2). Most of Camel milk locally consumed or processed for Kroot and whey by conventional method.

Recently, dairy products were tried from camel milk on commercial level, indicated reports regarding dairy products including yoghurt, butter, soft cheese, processed from camel milk (3-5).

Due to health promoting significance of Camel milk, the dairy products were processed commercially in many countries (United Arab Emirates). In Pakistan, dairy products from Camel milk yet not processed. This prompted use for processing the ice cream from Lassi Camel breed. The ice cream was

processed from Lassi Camel milk and investigated for the physio-chemical and sensory characteristics on day-0 and day-30.

MATERIAL AND METHODS

The Camel milk ice cream from pastoral camel milk was prepared according to method adopted by Mostafavi et al. (2016). Camel milk (local Lassi breed), skim milk powder and cream were purchased from local market, used for standardization of ice cream. Other ingredients including sugar and emulsifier were mixed at 500C. The whole mixture was pasteurized at 800C for 25 seconds, homogenized and placed for rapid cooling process at 50C, finally stored for aging up to 12 hours. Then ice cream was hardened at -350C and placed at -200C. The physico-chemical properties such as total solids, fat contents, acidity and pH were determined at day-0 and day-30 of storage. Sensory characteristics evaluation (texture, taste, flavor, and color) was performed by panel as previously reported by Chambers (2019) (6) on a 5-point hedonic scale on day-0 and day-30. Six samples were collected on day-0 and day-30.

STATISTICAL ANALYSIS

Data was presented as mean and standard deviation (mean $\pm$ SD) and were analyzed by student t-test and one-way ANOVA. Level of significance was set as $P < 0.05$.

RESULTS

The Table I illustrates the results of Physico-chemical properties of Lassi Camel before and after storage. The results describes that the total solid contents were significantly higher ($p < 0.05$) at Day-30 relative to Day-0 viz (31.85 $\pm$ 0.04). The fat and pH contents remained statistically unchanged. However, ice cream acidity was also higher ($p < 0.05$) at Day-30. The Table II illustrates the results of sensory characteristics of Lassi Camel before and after storage. The results describes that all the sensory attributes remained statistically alike ,however only numerical changes were found.

Table I. Physicochemical properties of Lassi Camel ice cream before and after storage

Description	Day-0	Day-30
Total Solids	31.85 $\pm$ 0.04	32.10 $\pm$ 0.18*
Fat	9.91 $\pm$ 0.03	9.90 $\pm$ 0.11ns
pH	6.47 $\pm$ 0.01	6.51 $\pm$ 0.05ns
Acidity	0.16 $\pm$ 0.04	0.15 $\pm$ 0.01*

Mean $\pm$ SD, * indicates significance level $P < 0.05$,
ns indicates non-significant difference

Table II. Sensory characteristics of Lassi Camel ice cream before and after storage

Description	Day-0	Day-30
Texture	6.47 $\pm$ 0.01	6.45 $\pm$ 0.03ns
Taste	5.55 $\pm$ 0.04	5.55 $\pm$ 0.02ns
Flavor	6.26 $\pm$ 0.01	6.24 $\pm$ 0.02ns
Color	6.30 $\pm$ 0.10	6.29 $\pm$ 0.01ns

Mean $\pm$ SD,
ns indicates non-significant difference

DISCUSSION

The camel milk having medicinal and health promoting effects, so the demand by public increased day by day for its consumption and its dairy products. Moreover, The sensory properties of milk are the most important reason people take milk and its products. Recently, dairy products were tried from camel milk on commercial level, indicated reports regarding dairy products including yoghurt, butter, soft cheese, processed from camel milk (3-5). That's why we processed ice cream from local camel breed and evaluated physiochemical and sensory characteristics. In this study, total solids increased, acidity decreased, sensory characteristics little declined (Texture, flavor, color).

CONCLUSION

Prolong storage period produced impact on total solids and acidity of ice cream and did not alter sensory characteristics. This preliminary study can be guidance to local community and industry for production of ice cream which will contribute to economy.

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