

Quality characteristics of low fat paneer developed from yak milk

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ABSTRACT

Yak milk paneer is a highly relished luxurious product in yak rearing tracts. Traditional full fat yak milk paneer has very high fat content, moderately desirable body and texture and poor microbial quality. Growing health concern of consuming fat rich products offers scope to develop low fat paneer from yak milk. Therefore, a study was undertaken to develop low fat paneer from yak milk and to evaluate its quality attributes. The results indicated that optimization of fat at 1% level increased the levels of SNF, protein and density in yak milk. The moisture and ash content increased but yield and fat content decreased in paneer prepared from low fat yak milk. Low fat paneer showed a decrease in total mesophilic and yeast and mold count. It is concluded that a well acceptable low fat paneer with improved body and texture can be prepared with 1% fat in yak milk.

Key words: Low fat, Milk, Paneer, Quality, Yak

Yak milk is creamy white in colour, having thick consistency and peculiar wet yak hair odour or sweat odour which is more prevalent in winter season. People those who have not tasted yak milk have to get accustomed to its taste because of the peculiar flavour. Preparation of paneer, an acid coagulated milk product, from yak milk is an excellent way to overcome this problem. In India, around 3% of the total milk produced is processed into paneer (Aneja *et al.* 2002). Traditionally yak milk paneer is prepared with full fat resulting in rich flavour, soft consistency, lower sliceability and early spoilage. Yak milk paneer having very high fat needs special attention due to growing concerns of health related problems arising from the consumption of fat rich milk products. Consumption of fat rich food products increases the risk of arterial hypertension, coronary heart disease and obesity.

Poorest of the poor people, the yak herdsman would also fetch a higher price for his product, if there is a shift in processing from full fat paneer to low fat paneer. This would add variety to the category of milk products prepared from yak milk, offering wide choice of food available for the consumers to select according to their health status. But till date, there is no information available on the development and quality evaluation of low fat paneer from yak milk. Therefore, a scientific study was undertaken with an objective to develop low fat paneer from yak milk and to evaluate its

physicochemical, microbial and sensory quality attributes.

MATERIALS AND METHODS

Yak milk was obtained from the Institute's farm of National Research Centre on Yak, Nyukmadung, Arunachal Pradesh. The cream of the yak milk was separated by using cream separator. The fat content of the milk was optimized by Pearson square method to 1% for preparing low fat paneer. The composition of yak milk was analyzed in a milk analyzer. A standardized formulation and processing steps were followed to prepare paneer from yak milk. The quality of paneer was evaluated by assessing the yield, proximate composition (AOAC 2002), microbiological assay (APHA 2001) and sensory attributes. A ten member trained sensory panel evaluated the difference in perception of appearance, flavor and body and texture of paneer using an 8-point descriptive scale (1= extremely poor to 8=excellent). The data generated by repeating the experiments were subjected to one sample t-test (Snedecor and Cochran 1995) using SPSS, version 10.0.

RESULTS AND DISCUSSION

The result of the composition of the low fat yak milk is shown in Table 1. Optimization of the level of fat to 1% in yak milk resulted in increase in levels of SNF, protein and density of the milk compared to the values reported in the full fat yak milk (Sharma *et al.* 2006). Decreasing the level of fat increased the level of total solids which contributed to the increase in density of the milk. As in Table 2, the yield

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Table 1. Composition of low fat yak milk

Parameters	Mean±SE
Fat (%)	1.03±0.18
SNF (%)	9.39±0.16
Protein (%)	3.53±0.06
Casein (%)	1.31±0.07
Density (g/cm ³)	1.0342±0.83

Table 2. Physicochemical characteristics of low fat yak milk paneer

Parameters	Mean±SE
Yield (%) [#]	15.94±1.47
Moisture (%)	58.24±2.11
Protein (%)	18.93±0.17
Ash (%)	3.79±0.46

n=10, #n=5.

Table 3. Sensory and microbial profile of low fat yak milk paneer

Parameters	Mean±SE
Sensory attributes ^{#*}	
Appearance	7.25±0.02
Flavour	6.80±0.03
Body and texture	6.80±0.03
Juiciness	6.45±0.03
Microbial count ^{##}	
Mesophilic count	2.86±0.10
Yeast and mold count	1.70±0.01

#n=50, ##n=10.

*Based on 8 point descriptive scale.

and fat percentage were significantly low compared to the values reported for the traditional full fat yak milk paneer (Kandeepan *et al.* 2009). Decreasing the level of fat probably reduces the level of fat globules available for the casein molecule to bind during the coagulation by the addition of citric acid to the hot milk. The availability of fat in the low fat paneer was about 4 times lower than the level present in full fat paneer. The protein content was slightly higher in the low fat yak milk paneer than the values reported for the full fat paneer. The moisture and ash contents were present in quite high amount in low fat paneer compared to the values reported for traditional full fat paneer prepared from yak milk.

The increase in moisture content might be attributed to the decrease in the level of fat in the low fat paneer made from yak milk.

Low fat paneer from yak milk improved the body and texture of the product, which was appreciated by the scores reported by sensory panel (Table 3). The improved body and texture scores offered very good sliceability to the paneer. However, the scores reported for the appearance, flavour and juiciness were lower than the sensory scores of full fat paneer (Kandeepan *et al.* 2009). The decrease in appearance, flavour and juiciness scores was attributed to the lower level of fat present in the paneer. The microbial count indicated (Table 3) a decrease in mesophilic and yeast and mold count compared to the values reported for the paneer prepared from full fat milk (Kandeepan *et al.* 2009). Lowering the level of fat probably decreased the level of microbes available with the fat globules, thereby lowered the level of microbes present in the final product.

CONCLUSION

Reducing the level of fat increased the SNF and density in low fat yak milk. A well acceptable low fat paneer can be prepared with 1% level of fat in yak milk. Low fat content of the yak milk reduced the yield of paneer. Low fat in yak milk improved the body and texture of the paneer and reduced the microbial load of the paneer.

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