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Sensory acceptability of yoghurt prepared from a blend of goat and cow milk

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Abstract

Present study was to evaluate the impact of the goat and cow milk blending on the sensory quality of yoghurt, for the purpose value added yoghurt was prepared with different levels of goat milk and cow milk. Sensory quality was evaluated on parameters of colour and appearance, body and texture, taste and flavor and overall acceptability by using 9 point hedonic scale. There were four treatments which were replicated five times. in varying proportion of goat milk (T₀100%, T₁60%, T₂70% T₃80%) and cow milk (T₁40%, T₂30%, T₃20%) were incorporated to assess the sensory acceptability of the best treatment. Sensory score for treatment T₁ (goat milk 60%+cow milk 40%) was found to be the best i.e. body & texture 7.46 and color & appearance 7.94, flavor & taste 8.22, and overall acceptability was found better for T₁.

Keywords: goat milk, cow milk, yoghurt, sensory acceptability

Introduction

Yoghurt, fermented milk, is believed to possess special nutritional attributes even though complete supporting scientific evidence has been lacking. Its consumption seemed to be associated with population having greater longevity. Yoghurt cultures produce certain metabolites during their growth in the product. That allows the milk proteins to be digested and absorbed more rapidly than the native protein. Certain of these metabolites also have definite antagonistic effect against food borne pathogens.

Yogurt made from cow milk is widely consumed in the world. On the other hand, there is a desire for alternatives to cow milk due to problems relating to gastrointestinal intolerance and market demand for the formulation of novel dairy products. Goat milk is reported to have higher digestibility and lower allergenic properties compared to cow milk (Cho-Ah-Ying *et al.*, 1990) ^[1]. It also has a higher content of short chain fatty acids in milk fat, higher content of zinc, iron, and magnesium, and antibacterial characteristics (Slacanac *et al.*, 2010). In addition, these benefits may be further enhanced by using goat milk as a vehicle for delivering probiotics and prebiotics.

Use of goat milk for preparation of various dairy products is an age old practice throughout the world. In fact, some of the products are exclusively prepared from goat milk, for instance cheeses in Europe and Kefir in Russia.

In general, goat milk is a source of high quality protein, fat, vitamins and minerals. Compared to cow milk, the goat milk contains about 13% more calcium, 25%-vitamin B₆, 47%- Vitamin A: it is 1.5 times richer in potassium, 3 times niacin, 4 times-copper and third-selenium. It has no carotene, it has been redesigned the body into vitamin A, it is much more vitamin B₁₂-hematopoietic factor controlling all metabolic processes in the body. Goat milk has a good antiradical property due to the high content of calcium, phosphorus, cobalt, copper, selenium, magnesium, iron, manganese, sialic acid, which is part of the body's immunological barriers (Chawala *et al.*, 1993) ^[2].

Caprine milk has advantages over bovine milk as baby food because it imparts greater resistance against diseases and it has very little allergic reaction to human body. It also reduces the cream line because fat content of goat milk is so finely divided in the milk (Tyagi and Prasad, 1989). Goat milk proteins are more digestible than cow milk proteins as it forms softer and more fragile curd in stomach when acidified. As a result proteolytic enzyme can break it down easily into smaller units and help in the treatment of peptic ulcers and infantile or adult cases of pyloric stenosis.

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desire for alternatives to cow milk due to problems relating to gastrointestinal intolerance and market demand for the formulation of novel dairy products. Goat milk is reported to have higher digestibility and lower allergenic properties compared to cow milk (Ranadheera *et al.*, 2012).

Material and Methods

The experimental work was carried out in the research laboratory of department of Dairy, Technology, Warner college of Dairy Technology, Sam Higginbottom University of Agriculture, Technology and Sciences, Allahabad. Cow and Goat Milk - it was collected from local village of Allahabad. And Traditional mixed yoghurt culture i.e. *Streptococcus salivarius sp. thermophilus* and *Lactobacillus delbrueckii ssp. bulgaricus* NCDC263 were obtained from National Collection Of Dairy Culture, Dairy Microbiology Division at NDRI (National Dairy Research Institute Karnal Haryana, India).

T₀ - Yoghurt prepared from Goat milk. (100:0)

T₁- yoghurt prepared by blending of goat and cow milk

(60:40)

T₂- yoghurt prepared by blending of goat and cow milk (70:30)

T₃- yoghurt prepared by blending of goat and cow milk (80:20)

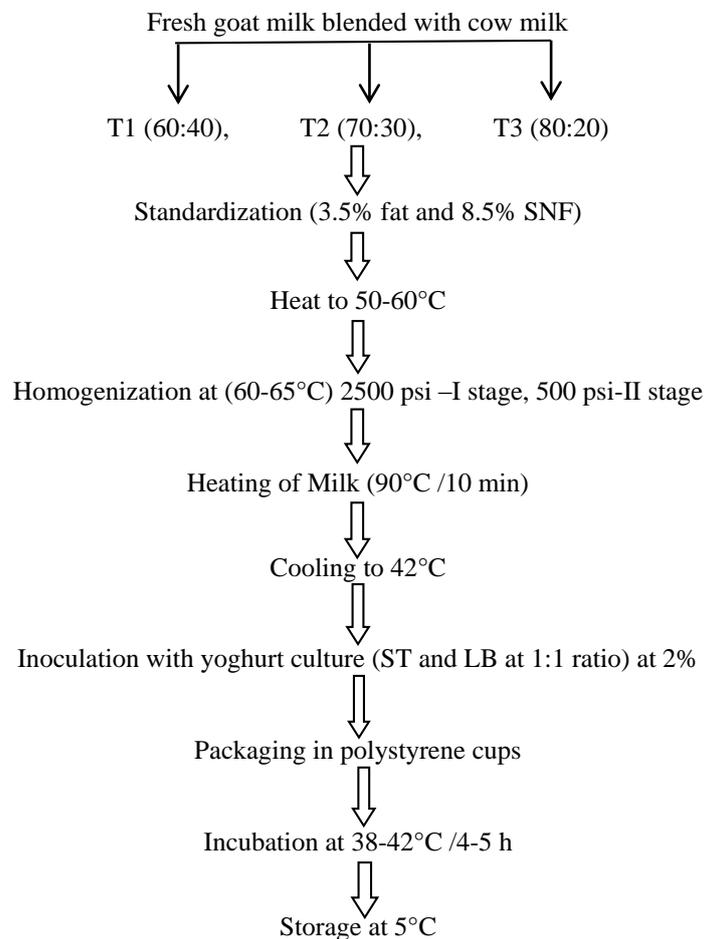
Procedure adopted for manufacturing Blended of A Goat and Cow milk Yoghurt

For control and experimental yoghurt was prepared by using different ratios Blending of Goat and Cow milk was optimized as (60:40, 70:30, 80:20). The milk was pasteurized, cooled to 42°C and yoghurt culture was added at 2.0%. Then mix was then incubated at 42°C till we achieve an acidity of 0.08 %. Then Filling into cups and Incubation (38-42°C/7hrs) again Cooling (5-8°C) and Storage (4-6 °C).

Preparation of yoghurt

On basis of the results of preliminary trails following steps in preparation of Blending of goat and cow milk yoghurt were found to be most satisfactory

Flow Diagram for preparation of experimental yoghurt by blending goat milk and cow milk

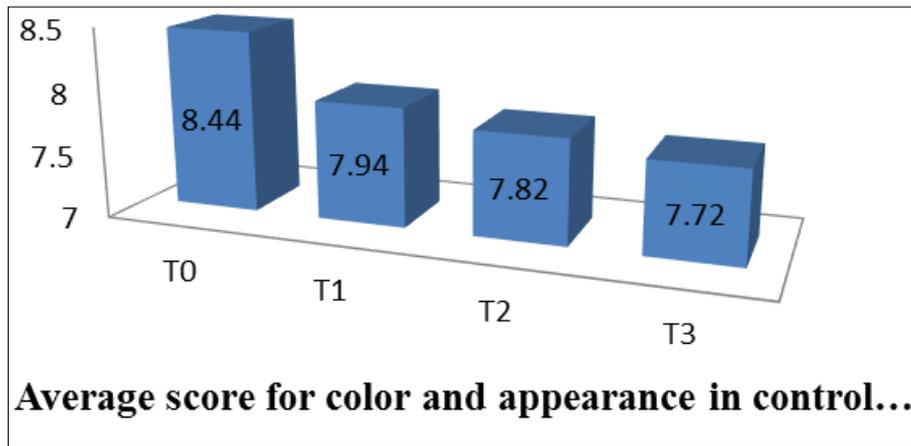


Results and Discussions

Sensory analysis: It was found that the highest score was observed in treatment T₁ in which value added mixed yoghurt was prepared by goat milk 60% with cow milk 40%.

Colour and Appearance: The sensory score of colour and appearance of the formulated product clearly indicated that treatment which had combination of goat milk (60%), cow milk (40%) had the significantly highest score followed by T₁

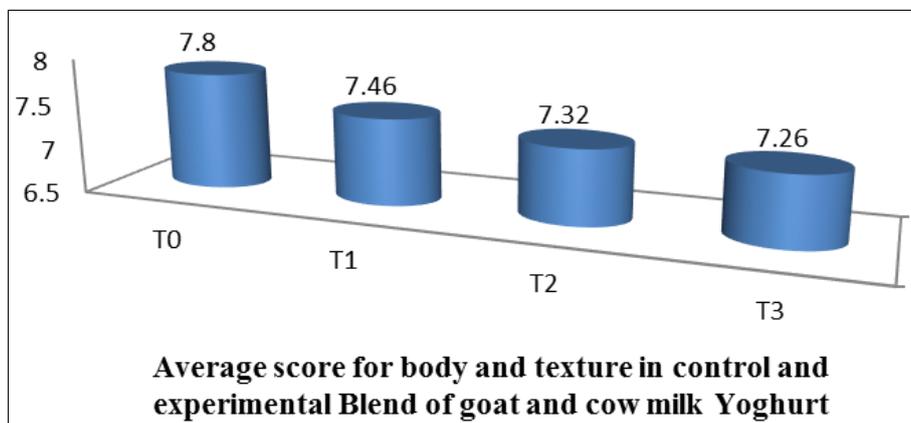
(7.94) and T₂ (7.82) and T₃ (7.72)., T₀ (8.14). The results showed that treatment T₁ was best in Colour and appearance percent because T₁ having suitable combination 60% goat milk and 40 % Cow milk. The difference in score for Color and appearance of yogurt was Significant. A numerical hedonic scale ranging from 1 to 9 (1 is very bad and 10 for excellent) was used for sensory evaluation. Ten experienced judges participated in the test.



Body and texture

Average sensory scores of body and texture of the formulated product cleaning indicated that treatment. The scores of T₀ (100% cow milk) ranged from 8.10-7.50, T₁ (60% goat + 40% cow milk) ranged from 7.90-6.90 T₂ (70% goat + 30% cow milk) ranged from 7.70-7.10 and T₃ (80% goat + 20% cow milk) ranged from 7.60-6.70 respectively. The highest

average score body and texture percent was 7.80 in T₀ followed by T₁ 7.46, T₂ 7.32 and lowest average score was obtained in T₃ (7.26). The results showed that treatment T₁ was best in body and texture percent because T₁ having suitable combination 60%goat and 40% cow milk. The difference in score for body and texture of yogurt was Significant.



Flavour and Taste

The scores of T₀ (100% goat milk) ranged from 8.5-7.80, T₁ (60% goat+ 40% cow milk) ranged from 8.60-8.00 T₂ (70% goat + 30% cow milk) ranged from 8.30-7.70 and T₃ (80% goat + 20% cow milk) ranged from 8.20-6.90 respectively. The highest average mean for Flavor and taste percent was

8.22 in T₁ followed by T₀ 8.16, T₂ 8.0 and lowest average score was obtained in T₃ (7.58). The results showed that treatment T₁ was best in Flavor and taste percent because T₁ having suitable combination goat% 60 and 40%cow milk. The difference in score for Flavor and taste of yogurt was Significant.

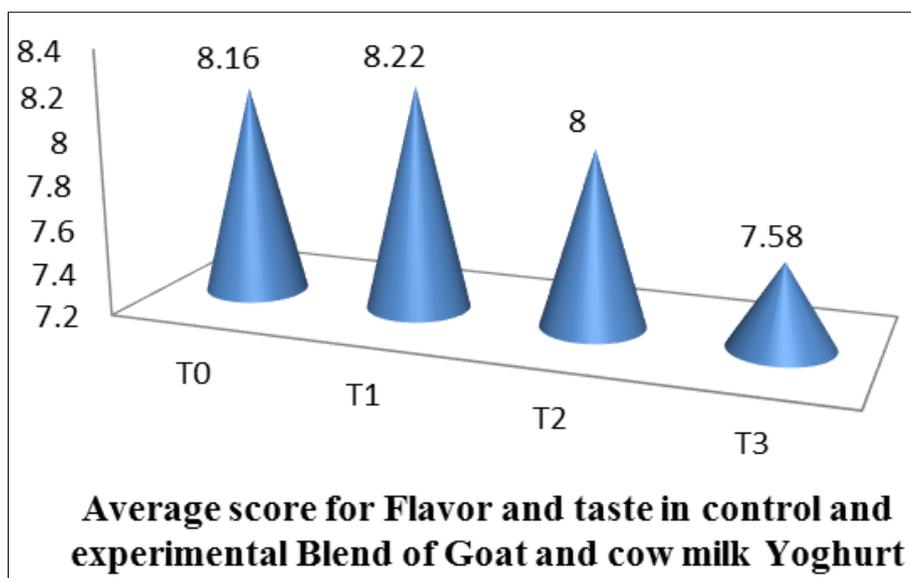


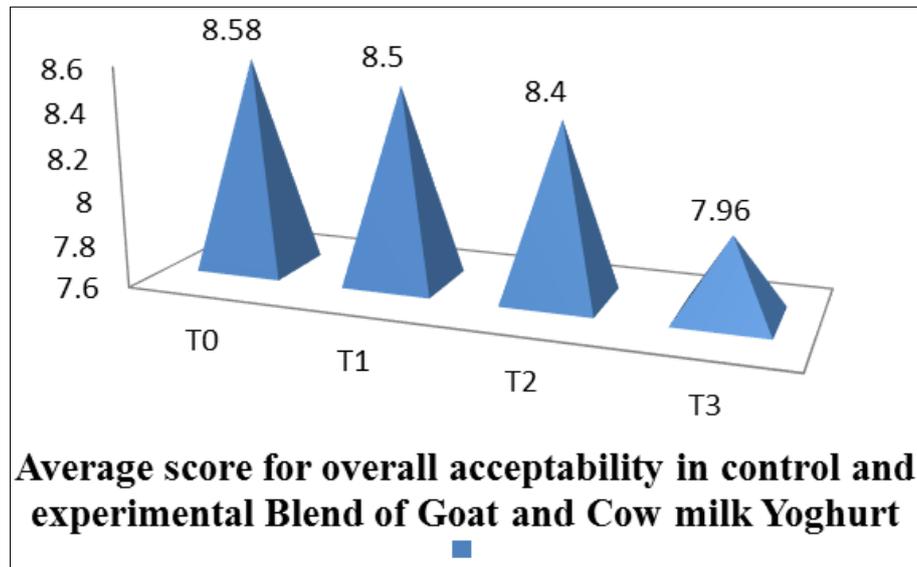
Table 1: Sensory characteristics of blended yoghurt goat milk (60%, 70%, 80%) and supplemented with cow milk 40% and 30%, 20%.

Yoghurt sample	Colour and Appearance	Body and Texture	Flavour and Taste	Overall Acceptability
T ₀	8.44	7.80	8.16	8.58
T ₁	7.94	7.46	8.22	8.50
T ₂	7.82	7.32	8.0	8.48
T ₃	7.72	7.26	7.58	7.96

Overall Acceptability

The highest average score overall acceptability percent was 8.58 in T₀ followed by T₁ 8.50, T₂ 8.40 and lowest average score was obtained in T₃ (7.96). The results showed that

treatment T₁ was best in overall acceptability percent because T₁ having suitable combination 60% Goat milk and 40% cow milk. The difference in score for overall acceptability of yoghurt was Significant.



Conclusion

On the basis of the results obtained during the study it was concluded that Blending of Goat and Cow milk can be used for the preparation of yoghurt. The data obtained on various parameters were statistically analyzed. Organoleptic evaluation showed that yoghurt prepared by using 60% Goat and 40% Cow milk were used (treatment T₁) was found to be more acceptable in terms of sensory quality.

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