



ORIGINAL ARTICLE

Sensory Properties of Dahi Prepared from Blending of Buffalo milk and Sweet corn milk

P. V. Padghan, Deshmukh N. B., Patil S. P., Mane R. R. and Katore V. D.
Vasantrao Naik Marathwada Krishi Vidyapith, Parbhani
College of Agriculture, Latur

ABSTRACT

The development of different types of dairy foods by using various nondairy ingredient like soy flour, soya milk, safflower milk, different fruit juices and dry fruits were tried and accepted by common consumers, is now well documented. Maize (Zea mays) is the major cereal crop in the world use as a staple food. Sweet corn is the species of zea mays containing modified carbohydrates imparting sweetness more than normal maize. In present study the dahi was prepared by using buffalo milk blended with sweet corn milk at different levels i.e. 20%, 30% and 40%. It was also observed that the overall acceptability score for treatment T₀, T₁, T₂ and T₃ was 8.09, 7.27, 7.49 and 6.02, respectively. It may therefore, be concluded that the blending of 30 per cent sweet corn milk in buffalo milk for dahi preparation is fairly acceptable, comparatively cheaper and adaptable as far as processing technology is concerned

KEY WORDS- Buffalo milk, sweet corn milk, dahi,

Received 08.02.2017

Revised 11.04.2018

Accepted 14.04.2018

CITATION OF ARTICLE

P. V. Padghan, Deshmukh N. B., Patil S. P., Mane R. R. and Katore V. D. Sensory Properties of Dahi Prepared from Blending of Buffalo milk and Sweet corn milk. **Adv. Res. Agri. Vet Sci.**, Volume 5 [3] May 2018: 21-26

INTRODUCTION

The development of a product specially food can be a slow and tedious journey that offers no promise of a successful end, so anything a developer can do to assure them they are on the right track is a step towards success. Many of the issues that arise during the development of a product cannot be controlled by the developer. Things such as competition, short timelines, changes in strategy, unavailable materials, and changes in the targets and regulations are some of the barriers that the developer may face. Difference testing can be used to confirm similarities or differences throughout the stages of development, from initial prototype to final product. The developer decided to run an acceptance/preference test to determine if both products were acceptable and equally preferred. The results showed both samples were equally acceptable and there was no preference, so the developer could feel confident that he could move forward with the new sweetener supplier.

In human nutrition, milk and milk products are very important constituent of food for people of all ages. Milk carries many nutrients required for growth and development of children, adolescent, elderly people, pregnant and nursing mothers. Milk plays an important role in meeting the requirements of many essential nutrients, and hence milk is considered as a protective food. Milk helps to balance human diet by supplementing good quality protein, calcium and vitamins particularly, vitamin A, riboflavin, niacin and folic acid. In addition milk contains several bio-protective molecules that ensure health security to humans. However, milk is also a suitable media for microorganisms and can spoil easily. But by using selective bacteria particularly *lactobacillus spp.* under control condition i.e. temperature and time, milk is converted in to more palatable and nutritious food like *dahi*, yoghurt and cheese.

Fermentation has been an ideal technology to preserve milk from time immemorial. The production of fermented foods is one of oldest food processing technologies known to man. Fermented milk products are rich in protein, vitamins and mineral and reported to be effective in the treatment of many disease like constipation, diarrhea, acidity, gastro-enteritis, tumor genesis, hypercholesterolemia, etc. (Patel and Renz-Schauen, 1997).

Dahi, Indian curd, is a well-known fermented milk product consumed by majority of population throughout the country, either as a part of the daily diet or as a refreshing beverage. It is an age old

indigenous fermented milk of India and has managed its popularity in Indian diet despite changing lifestyle and food habits. The use of *dahi* has been prevalent since Vedic times and it is mentioned in ancient scriptures like Vedas, Upanishads and various hymns. *Dahi*, which came into use as a means of preserving milk nutrients, was probably used by Aryans in their daily diet, as it reduced putrefactive changes and provided an acidic, refreshing taste (Gawai and Prajapati, 2012). Since *dahi* is made from milk, it contains all the nutrients which are present in milk with the exception of lactose. The preparation of *dahi* is largely confined to local halwais, shops, restaurants and in homes by traditional methods that is milk is boiled, cooled to body temperature, incubated with previous days *dahi* or butter milk and then allowed to set undisturbed overnight (Gawai and Prajapati, 2012). *Dahi* is prepared by using starter cultures, growing at appropriate temperature depending upon the strains used. The types of organisms include *Lactococcus lactis* spp. *lactis*, *Lactococcus lactis* spp. *cremoris*, *Lactococcus lactis* spp. *lactis* var. *diacetylactis*, *Leuconostoc mesenteroides* spp. *cremoris*. *Dahi* is also prepared by using thermophilic starter, viz., *Streptococcus thermophilus*, *Lactobacillus delbrueckii* spp. *bulgaricus* and other *Lactobacillus* species.

The use of cereals with high protein content plays a significant role as a partial substitute for milk solids. To be healthy and active, the diet must be adequate in quantity and quality to meet the energy level and nutrient requirement. Addition of cereal protein enhances the nutritive value and open new avenues in value addition. An increase in solids not fat content contribute to an increase in protein percent which in turn contribute to the refinement in the taste of newly developed product with improved consistency, viscosity and reduced whey separation. (Vijayalakshami *et. al.*, 2008)

Corn is one of the major cereal crops in the world. Among the numerous corn sub species grown sweet corn is become more important due to its taste and nutritional value has made it a valued crop in all countries. Corn is rich source of starch. Sweet corn and corn milk which is noted for its aroma and sweet taste. The corn is high in vitamin content particularly carotene and essential sulphur containing amino acid and it is also low in saturated fat and cholesterol.

The development of different types of dairy foods by using various nondairy ingredient like soy flour, soya milk, safflower milk, different fruit juices and dry fruits were tried and accepted by common consumers, is now well documented. Maize (*Zea mays*) is the major cereal crop in the world use as a staple food. Sweet corn is the species of *zea mays* containing modified carbohydrates imparting sweetness more than normal maize. The literature on use of sweet corn in milk and milk products are very rare. Only very limited information is available on the preparation of sweet corn milk but its application in the preparation of Indian dairy products particularly traditional dairy product till remain. The significance of traditional knowledge, their combination with scientific know-how and the demand from consumers for variety and health conscious have prompted to look for variation in products such as *dahi* prepared by using sweet corn milk.

During the recent years, there has been an increasing interest in understanding the relationship between foods, effect of different food combination on nutritious and completeness of food. So the present study is proposed with the process for the preparation of *dahi* using buffalo milk blended with sweet corn milk.

MATERIAL AND METHODS

The material used and methods employed during the course of present investigation on preparation of *dahi* from blends of buffalo milk with sweet corn milk are as under.

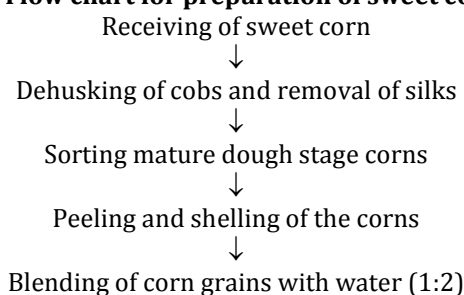
Collection of buffalo milk

Fresh and standardized buffalo milk was obtained from the local market of Latur city of Natural Milk Pvt, Ltd, Latur.

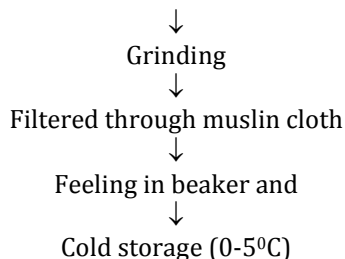
Collection of sweet corn

Fresh sweet corn variety, Masti (F1, Hybrid) of Nuziveedu seeds Pvt, Ltd, was purchased from local market of Latur city.

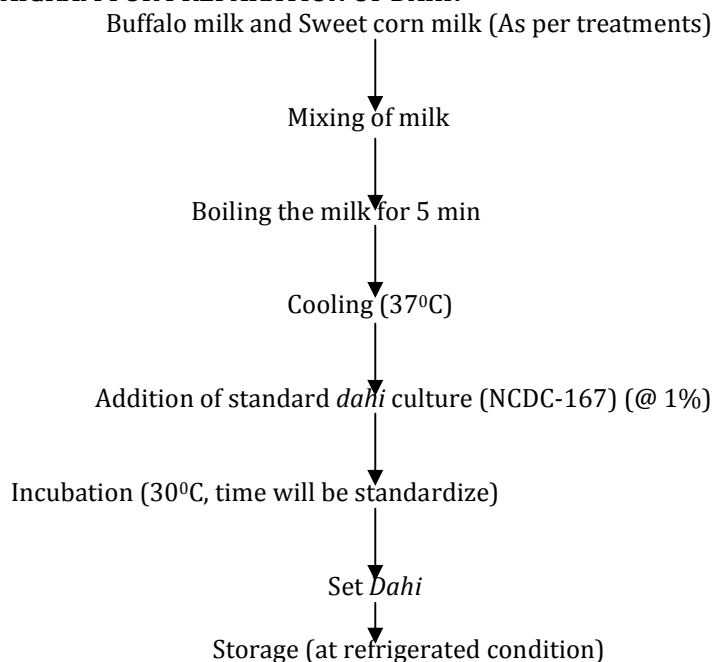
A. Flow chart for preparation of sweet corn milk



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B. FLOW DAIGRAM FOR PREPARATION OF DAHI:



Treatment combinations

For preparation of *dahi* from sweet corn milk blended with buffalo milk, the treatment combinations were as follows.

- T₁ - 100 parts Buffalo milk *dahi*
- T₂ - 80 parts buffalo milk + 20 parts sweet corn milk
- T₃ - 70 parts buffalo milk + 30 parts sweet corn milk
- T₄ - 60 parts buffalo milk + 40 parts sweet corn milk.

The different levels will be tried and compared with control (T₁).

Sensory properties

Sensory evaluation of controlled *dahi* and developed *dahi* was done by semi expert panel of judge by 9 point hedonic scale. The sensory properties such as colour and appearance, flavour, body and texture, taste and overall acceptability were studied.

RESULT AND DISCUSSION

Table No.1: Sensory score of *dahi* prepared from sweet corn milk blended with buffalo milk

Parameters Treatments	Colour and Appearance	Flavour	Body and Texture	Taste	Overall Acceptability
T ₀	8.00 ^a	8.00 ^a	8.37 ^a	8.00 ^a	8.09
T ₁	7.37 ^a	7.25 ^b	7.50 ^a	7.62 ^a	7.27
T ₂	7.50 ^a	7.20 ^b	7.62 ^a	7.12 ^a	7.49
T ₃	6.12 ^b	6.00 ^c	6.12 ^b	5.87 ^b	6.02

Colour and Appearance

It is revealed from the above table that the range of mean score for colour and appearance was observed between 6.1 to 8.0 for T₀ and T₃ respectively. The treatment T₀, T₁ and T₂ were found at par with each other at 5 per cent level of significance but treatment T₃ was showed lowest score i.e. 6.12 and significantly differ from other three treatments.

The higher score for colour and appearance was recorded for treatment T₀ followed by T₂, T₁ and minimum T₃. This indicates that as the proportion of sweet corn milk increased within the blend the intensity of yellow colour increased in treatment T₃ due to which score reduced. The colour of corn milk blended *Dahi* was noticeably more yellow as compared to buffalo milk. Carotene is primary responsible for yellow colour of corn milk (Fox and McSweeney, 1998) should be considerably higher for corn milk *Dahi*. The other corn starch might be responsible for the colour development.

The values recorded for colour and appearance of *Dahi* prepared from sweet corn milk blended with buffalo milk in the present investigation are comparable with the findings of below mentioned research workers.

It was conducted by different scientist that the blended food material are responsible for colour variation in *Dahi* e.g. fruit *Dahi* prepared from strawberry, orange and grapes showing colour variation (Hossian *et. al.*, 2012, Patil *et. al.*, 2009)

Flavour

It is observed from the above Table that the average mean score for flavour were ranges between 6 to 8 for all treatments combinations respectively. The maximum flavor score was recorded in treatment T₀ followed by T₁, T₂ and T₃. In blended treatment higher score was observed by treatment T₁ i.e. 8.25 lower than control but it was not significantly differ from treatment T₂. All treatments were acceptable for flavor parameter scored rate then 6 point on 9 point Hedonic scale.

As the sweet corn milk was increased the slightly starchy flavour was observed in treatment T₃ due to which it dislikes by judges. The values recorded for flavour of *Dahi* in this study was found low with the findings of Dudal *et. al.*, (2009), who conducted the experiment on studies on quality of yoghurt prepared from blend of goat and cow milk and reported the flavor scores ranges between 8.4 to 8.76 per cent. The reason behind it that they used animal milk where we used milk from plant source.

Body and Texture

The body and texture is main parameter in food as far as the consumer liking is concerned. From the above table it was observed that the score for body and texture for the treatments T₀, T₁, T₂ and T₃ were 8.37, 7.5, 7.62 and 6.12, respectively. As the sweet corn milk was increased the slightly starchy flavor was observed in treatment T₃ due to which it dislikes by judges. The maximum score was found in control sample where as minimum score was recorded in T₃ treatment. When we look regarding body and texture it is clearly indicates that as there proportion of sweet corn milk increased the score was decreased, the grainy structure was observed in treatment T₃ which disturb the body and texture of *Dahi* prepared by using 40 per cent sweet corn milk with buffalo milk. The control *Dahi* was higher score than blended *Dahi* , which were score sandy or graininess mouth feeling by judges when increase the proportion of sweet corn milk in blend. This indicates that some part of starch, carbohydrate and protein affect on the body and texture of *Dahi* due to which reduce the body and texture score.

Santo *et. al.* 2013, observed the same trend in yoghurt prepared by using passion fruit fiber. The variation might be due to the sensory panel that was not familiar with cereal blended milk product which affected on their sensory. There are in agreement with Ribeiro *et. al.* (2010), who reported that the Brazilian yoghurt market is dominated by fruit flavor yoghurt and sweet and colorful yoghurt are those preferred by consumer. Therefore some sensory properties of new developed product may have been under confused by the consumer and not a custom to its characteristics. Further Fernandez-Garcia and McGregor (1997) reported that the supplementations of with oat fiber reduce the score for texture but the author referred to healthy benefits of new product to justify its use.

Taste

It is revealed from the above table that the score for taste for all treatments ranges between 5.87 to 8 respectively. Treatment T₃ was showed lowest score i.e. 6.12 and significantly differ from other three treatments. Among the level of addition of sweet corn milk, the lowest score for taste was obtained at 40 per cent which level and higher score was recorded by T₀ (control) followed by T₁, T₂, and T₃. As far as the blends were concerned T₁ combination had been preferred by the judges for taste than the other treatment combination.

As the sweet corn milk was increased the slightly starchy taste was observed in treatment T₃ due to which it dislikes by judges.

In the study of Salwa *et al.*, (2004) yoghurt supplemented with 5 to 20 per cent carrot juice was highly acceptable by the consumers first of all due to its sweet and pleasant taste. In our study, 10 per cent blended sweet corn milk *Dahi* got higher score and *Dahi* prepared with 40 per cent blend of sweet corn milk got lowest score within blend. The control sample got the higher score than blends. T₃ treatment which have unacceptable or undesirable taste.

Overall acceptability

Above table shows that the mean overall score of acceptability of *Dahi* from sweet corn milk blended with buffalo milk for the treatments T₀, T₁, T₂ and T₃ was 8.09, 7.27, 7.49 and 6.02 respectively. The overall acceptability score indicate that the treatment T₂ was significantly superior over rest of the treatments which had the highest mean score 7.49 as it was liked very much by the judges. The lowest overall acceptability score 6.02 was found in treatment T₃ which was due to increased level of sweet corn milk which decreased colour and appearance, body and texture, flavor, and hence its overall acceptability score was less as compared T₂ and T₁ treatments.

The values recorded for overall acceptability of *Dahi* prepared from sweet corn milk blended with buffalo milk in the present investigation are comparable with the findings of below mentioned research workers. Dudal *et al.*, (2009) conducted the experiment on studies on quality of yoghurt prepared from blend of goat and cow milk and reported the overall acceptability scores ranges between 8.40 to 8.94 per cent.

CONCLUSION

It was observed that the overall acceptability score for treatment T₀, T₁, T₂ and T₃ was 8.09, 7.27, 7.49 and 6.02, respectively. The blend of treatment T₂ was more acceptable than treatment T₁ and T₃. The cost for treatment T₂ was 97.7 Rs./Kg. It may therefore, be concluded that the blending of 30 per cent sweet corn milk in buffalo milk for *dahi* preparation is fairly acceptable, comparatively cheaper and adaptable as far as processing technology is concerned.

ACKNOWLEDGEMENT

The authors thanks to the Vasanttrao Naik Marathwada Krishi Vidyapith, Parbhani and College of Agriculture, Latur (MS).

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