



Studies on sensory evaluation and cost analysis of steam sandesh prepared from colostrum and cow milk

J. DAVID

ABSTRACT : A study was conducted to utilize bovine colostrum for preparation of steam Sandesh, containing different ratios of colostrum and cow milk. Three ratios 50:50, 60:40 and 70:30 containing same level of fat per cent and different levels of SNF per cent were used. Freshly made chhana was broken into bits and mixed with groundsugar. Put the mixture in a stainless steel lunch box inside a pressure cooker with half of the lunch box dipped in water. Heated on a slow fire for 5 minutes, poured it into a tray and let it to cool and set. Now Sandesh is ready. Steam Sandesh having 50:50 ratios of colostrum and cow-milk was most acceptable, followed by 60:40, 70:30 and control Sandesh. The product was analyzed for organoleptic attributes (flavour and taste, consistency, colour and appearance and overall acceptability) by trained panelist using 9 point hedonic scale. Physicochemical (fat, total solids, acidity, protein, moisture) and microbiological (SPC, yeast and moulds, coliform) analysis were done for estimating its nutritional content and safety. Based on the statistical analysis of data obtained from various parameters using different ratios of mixture, experimental treatments were found superior to control as far as organoleptic attributes are concern. Among the treatments the highest score was reported in T_1 followed by T_2 , T_3 and T_0 . Thus, as far as product acceptability judged by organoleptic evaluation, the treatment can be rated as $T_0 > T_1 > T_2 > T_3$. The data regarding cost of Control and Colostrum Steam Sandesh was found as cheap in T_1 (47.68 Rs./kg), followed by, T_2 (55.08 Rs./kg), T_3 (69.96 Rs./kg), and T_0 (84.46 Rs./kg).

KEY WORDS : Cow milk, Colostrum, Steam sandesh, Cost analysis

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INTRODUCTION

Sandesh is a popular chhana based sweet. Sandesh (meaning “message”) is perhaps the oldest sweet-meat of Bengal where there is a traditional custom to send some Sandesh along with a good message to relative and friends (David, 2013). Steam Sandesh (vapa) is one of the traditional milk products which are still very popular in Bengal. Generally the product is made from cow milk. The sweet is known for its palatability and aroma. It is a good source of milk protein and fat. Colostrums are breast milk produced after the birth of the new born and last for

2-4 days (Kaushik *et al.*, 2002). Colostrums are very important part of breast milk and lays down the immune system and confers the growth factors and other protective factors for the young ones in mammals. This is the source of passive immunity achieved by the mother and is transferred to the baby (Thapa, 2005). Bovine colostrums have been used in many disorders in human beings. Five different types of immunoglobulins *viz.*, Ig A, Ig D, Ig E, Ig G and Ig M have been isolated from colostrum. Bovine colostrum contains 8-25 per cent, Ig G whereas human colostrum contain 2 per cent IgG. These are protein molecules, which have important role in the body to fight against infection (Davidson *et al.*, 1989). There is a need for utilization of colostrum to prepare Steam Sandesh as it will enhance the therapeutic value of the product which

AUTHOR FOR CORRESPONDENCE

J. David, Department of Dairy Technology, Sam Higginbottom Institute of Agriculture, Technology and Sciences, ALLAHABAD (U.P.) INDIA
Email : profjohndavid06@gmail.com

otherwise go as waste. Colostrum may be added with cow milk to get a better Sandesh. Keeping in mind the therapeutic properties and other nutritional uses of colostrum, an attempt has been made to explore the use of colostrum for manufacturing of Steam Sandesh using the method of manufacture as laid down by (Sen and Ragoria, 1990).

MATERIAL AND METHODS

First of all, cow milk containing 4 per cent fat was used as control and for experimental treatments same level of fat per cent used but different levels of SNF per cent were taken. In T_1 admixture of cowmilk and colostrums were 50:50 ratio (Fat 4%, SNF 14.65%), T_2 was 60:40 ratio (Fat 4%, SNF 13.40%) and T_3 was 70:30 ratio (Fat 4%, SNF 12.18%). Milk were heated at 70°C and coagulated by using 1 per cent citric acid solution. Fresh chhana was broken into bits and sugar mixed into it @30 per cent of dry matter. The mixture was kept in a stainless steel box and placed in a pressure cooker with half of the box dipped in water. It was then heated on a slow fire for 5 minutes. Afterwards the product was poured in a tray and left to cool and set. It was then cut into desired size and shape. Thus, the Sandesh was ready. Samples were tested for physicochemical parameters (fat, protein, T.S, acidity and moisture) and microbiological (SPC, yeast and moulds, coliform) as per procedure given in the food chemistry manual of Allahabad Central University. Organoleptic attributes were judged by trained panelist using 9 point hedonic scale.

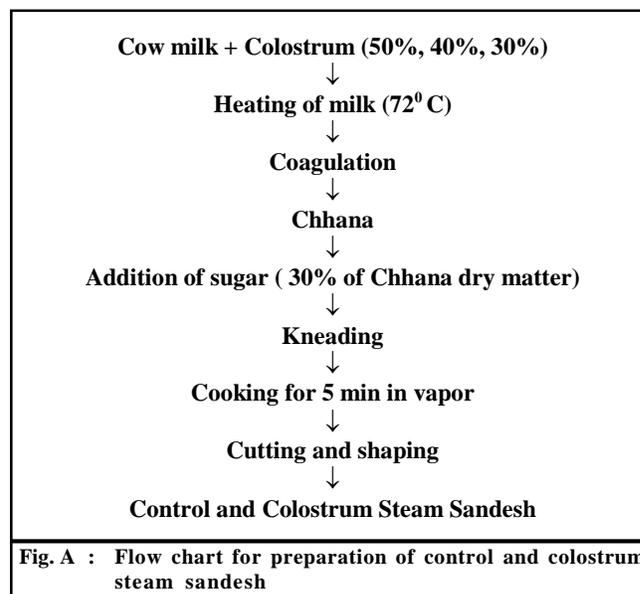
Organoleptic evaluation of the prepared product:

Freshly prepared products were served for evaluation to panel members consisting of 5 experienced persons. 9 point hedonic scale proforma was used as suggested by Amerine *et al.* (1965).

Statistical analysis:

The data obtained on different aspects as per plan were tabulated and statistically analyzed as per Chandel (1991).

Materials	Different treatments (Control and Colostrum Steam Sandesh)			
	T_0	T_1	T_2	T_3
Cow milk	100	50	60	70
Colostrum	-	50	40	30



RESULTS AND DISCUSSION

The results of the present study as well as relevant discussions have been presented under following sub heads:

Organoleptic attributes of control and colostrum steam sandesh :

Table 1 shows organoleptic attributes of control and Colostrum Steam Sandesh

Colour and appearance :

There were significant differences found among the treatments for colour and appearance. As per Table 1; the highest score for colour and appearance was obtained in T_1 (8.04), followed by T_0 (7.94), T_2 (7.67) and T_3 (7.56). F Value was 4.47, indicating significant effect of treatment on colour and appearance (Fig. 1).

Body and texture :

The average score for body and texture differed significantly. Highest score for body and texture was recorded as 7.91 in T_0 , followed by 7.4 in T_3 , 7.20 in T_2 and 7.13 in T_1 . F Value was 3.58, indicating significant effect of treatment on body and texture (Fig.1). The differences among the treatments were significant.

Flavour and taste :

There was significant difference found among the treatments for flavour and taste score. The differences

in these were significant. The highest score for flavour and taste was recorded as 7.74 in T₁, followed by 7.57 in T₀, 7.42 in T₂ and 7.29 in T₃. The differences in these were significant. F Value was 4.26, indicating significant effect of treatment on flavour and taste (Fig. 1).

Overall acceptability scores for control and colostrum steam sandesh :

As per Table 2 and Fig. A the overall acceptability scores in samples of Steam Sandesh ranged from 6.70-8.70, However, the highest mean overall acceptability

score was recorded in Steam Sandesh as 7.95 in control (T₀), followed by T₁(7.64), T₂(7.46) and T₃(7.24). The differences were found significant indicating thereby a significant effect of treatments on this parameter. F Value was 4.62, indicating significant effect of treatment on overall acceptability (Fig. 1).

Cost analysis of control and colostrum steam sandesh :

The data regarding cost of Control and Colostrum Steam Sandesh was found as cheap in T₁ (47.68 Rs./kg),

Table 1 : Organoleptic characteristics colostrum steam sandesh

Parameters	Control and colostrum steam sandesh				F value	C.D.
	T ₀	T ₁	T ₂	T ₃		
Colour and appearance	7.94	8.04	7.67	7.56	4.47*	0.29
Body and texture	7.91	7.13	7.20	7.40	3.58*	0.64
Flavour and taste	7.57	7.74	7.42	7.29	4.26*	0.75

* indicates significance of value at P=0.05

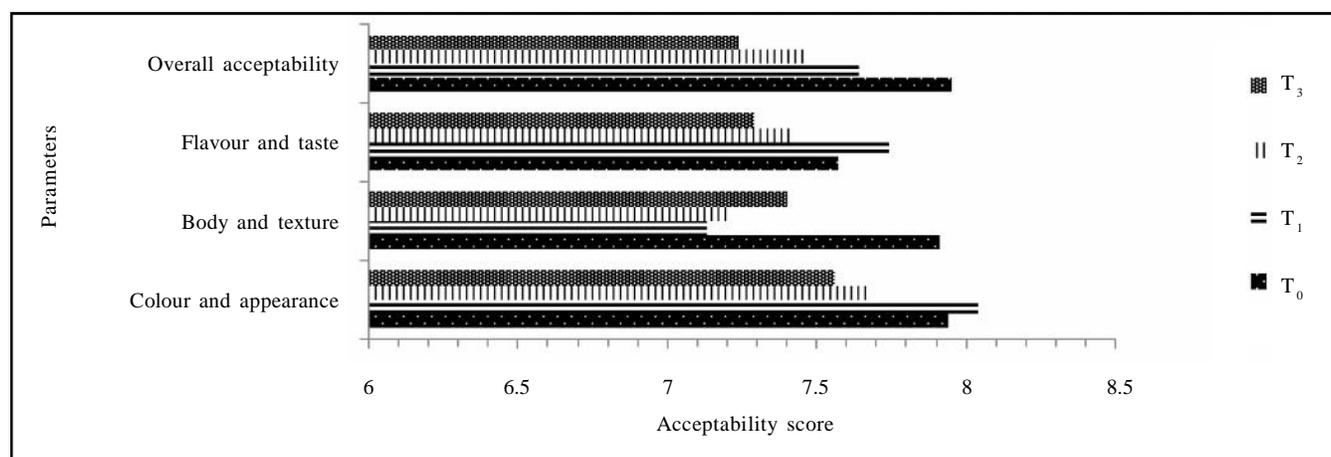


Fig. 1 : Average of organoleptic parameters and overall acceptability score control and colostrum steam sandesh

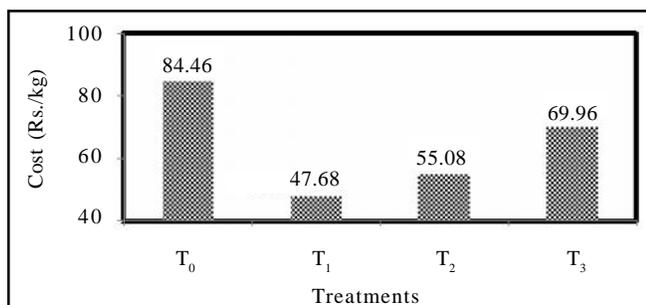
Table 2 : Overall acceptability scores for control and colostrum steam sandesh

Replication	Control and colostrum steam sandesh				F value	C.D.
	T ₀	T ₁	T ₂	T ₃		
1	8.0	8.1	6.8	6.9	4.62*	0.52
2	8.2	8.0	6.7	6.7		
3	8.2	7.3	7.0	7.2		
4	8.4	7.5	7.0	7.0		
5	8.1	7.4	8.4	7.3		
6	6.9	7.5	7.0	7.3		
7	7.9	7.4	8.7	7.3		
8	7.7	7.6	8.5	7.3		
9	8.3	6.8	7.7	7.7		
10	7.8	8.7	6.8	7.7		
Mean	7.95	7.64	7.46	7.24		

* indicates significance of value at P=0.05

Table 3 : Cost analysis of control and colostrum steam sandesh in the year 2009-2010

Parameters	Control and colostrum steam sandesh			
	T ₀	T ₁	T ₂	T ₃
Cost (Rs./kg)	84.46	47.68	55.08	69.96

**Fig. 2 : Cost analysis of control and colostrum steam sandesh**

followed by, T₂ (55.08 Rs./kg), T₃ (69.96 Rs./kg), and T₀ (84.46 Rs./kg) (Table 3 and Fig. 2).

Conclusion:

On the basis of results obtained it can be concluded that colostrum can be successfully used for improving sensory quality and therapeutic value of Steam Sandesh. Treatment T₁ was the best as per as overall acceptability

concern. The data regarding cost of Control and Colostrum Steam Sandesh was found as cheap in T₁ (47.68 Rs./kg), followed by T₂ (55.08 Rs./kg), T₃ (69.96 Rs./kg), and T₀ (84.46 Rs./kg).

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