



EFFECT OF DIFFERENT LEVELS OF COLOSTRUM ON YIELD AND PHYSICO- CHEMICAL PROPERTIES OF SITA BHOG

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Abstract

A study was conducted to utilize bovine colostrum for preparation of 'Sita Bhog', containing different ratios of colostrum and cow milk. Three different ratios 50:50, 60:40 and 70:30 containing different levels of fat and SNF percentage were taken. Freshly made chhana was mixed into rice dust in the ratio of 4:1. Then the mixture of chhana and rice dust was put into the 'sev' mould for the preparation of noodles. These noodles are fried in ghee and then soaked into sugar syrup for 2-3 hrs. Then the sugar was drained and "SitaBhog" was ready to serve. "Sita Bhog" having 50:50 ratios of colostrum and cow-milk was most acceptable, followed by 60:40, 70:30. The product was analyzed for organoleptic attributes (flavour and taste, texture, colour and appearance) by trained panelist using 9 point hedonic scale. Physicochemical (fat, total solids, acidity, protein and moisture) and microbiological (SPC, yeast and mould, coliform) analysis were done for estimating its nutritional content and food safety. Based on the statistical analysis of data obtained from various parameters using different ratios of mixture, it was found experimental 'Sita Bhog' was superior to control as far as organoleptic attributes are concerned. Thus, as far as overall acceptability of the product, the treatment can be rated as $T_1 > T_0 > T_2 > T_3$.

Keywords: Cow Milk, Colostrum, Sita Bhog.

INTRODUCTION

Colostrum is a pre-milk substance that is produced immediately after birth. It is lemon yellow mammary secretion and is rich in proteins. This last for 2-4 days after the lactation has started. This contains protective antibodies to prevent infections in the new born called passive immunity (1). Bovine colostrum contains useful ingredients which have been found to be beneficial in various diseases in human beings. In gastrointestinal tract (GIT) Bovine colostrum has great role in terms of maintenance of integrity of mucosa, permeability, local immunity, systemic immunity and antigen handling. There are clinical observations to support that Bovine colostrum is effective in the treatment of bacterial and viral diarrhea in adults and children (2). Colostrum 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 (3). Bovine colostrum 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%, Ig G whereas human colostrum contain 2% IgG. These are protein molecules, which have important role in the body to fight against infection (4). Colostrum has immense food and nutritive value, besides its therapeutic value, which is important aspect for traditional milk products to survive in the market. 'Sita Bhog' is a very popular sweet of West Bengal, especially in Burdwan district. It is dazzling white in colour with moist shining surface. It has a pleasant flavour, soft body and a small noodle like structure. It is prepared from chhana and good quality rice dust in 4:1 ratio (5). Special variety of Govind bhog rice gives best flavour and taste to 'Sita Bhog'. There is a need for utilization of colostrum as it will enhance the therapeutic value of the product which otherwise go as waste, colostrum may be added with cow milk to get a better 'Sita Bhog'. Therefore, keeping in mind the functional and therapeutic properties an attempt has been made to explore the use of colostrum for manufacturing of 'Sita Bhog' using the method of manufacture as laid down by (6).

METHOD AND MATERIALS

First of all, cow milk was standardized to 4% fat and 8.5% SNF. Three different levels of colostrum i.e. T_1 (50% colostrum), T_2 (40% colostrum) and T_3 (30% colostrum) now added with cow milk. It was heated at 70°C and coagulated by 1% citric acid. The chhana obtained then kneaded with rice dust (4:1) and noodles are formed. Noodles are further fried in desi ghee for 10 minutes. It was then dipped in sugar syrup for two hours. Now the product was ready to be served. The samples were tested for physicochemical parameters (fat, protein, T.S, acidity, & moisture) and microbiological parameters (SPC, yeast and mould, coliform) as per procedure given in the food chemistry manual of Allahabad Central University. Organoleptic attributes (colour & appearance, body & texture, flavour & taste) were judged by trained panelist using 9 point hedonic scale. The data collected on different aspects as per plan were tabulated and statistically analyzed as per (7).



Table-1: Details of different treatments of Control and Colostrum Sita Bhog

Materials	Different treatments(Control and Colostrum Sita Bhog)			
	T ₀	T ₁	T ₂	T ₃
Cow milk	100	50	60	70
Colostrum	-	50	40	30

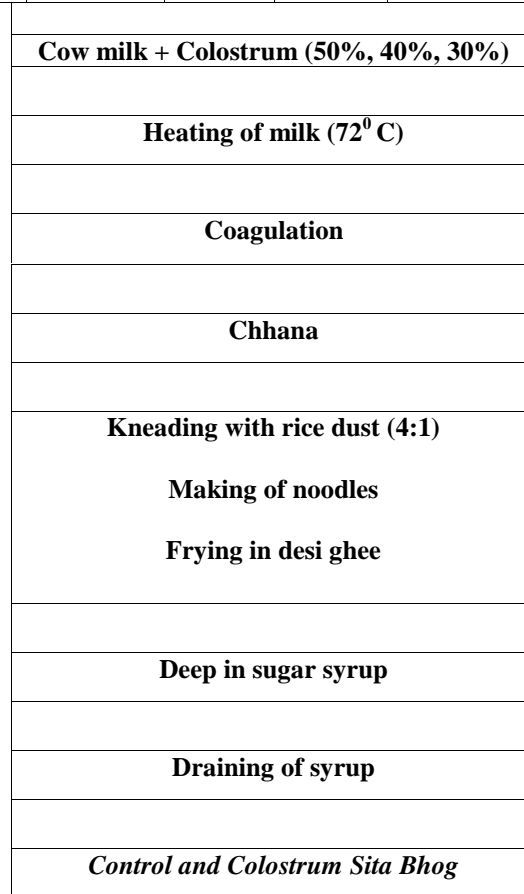


Figure 1: Flow chart for preparation of Control and Colostrum Sita Bhog

RESULTS AND DISCUSSION

Table-2 shows average of different parameters studied.

Physicochemical properties of Control and Colostrum Sita Bhog

Moisture percentage

The moisture percentage of different experimental treatments did not differ significantly. T₃ (33.60) was the highest moisture, followed by T₀ (33.00), T₂ (32.20) and T₁ (31.60). F value was 2.27, indicating no significant effect of treatment on moisture percentage.

Fat percentage

There were significant differences found in the average fat% of different treatments. T₀ has highest score of (12.0%), followed by T₃ (11.56%), T₂ (11.27%) and T₁ (10.75%). F value was 27.8, indicating significant effect of treatment on fat percentage.

Protein percentage

Total solids content was highest in T₁ (68.40), followed by T₂ (67.80), T₀ (67.00) and T₃ (66.40). The treatments did not differ significantly. F value was 309.72, indicating significant effect of treatment on protein percentage.



Table-1: Physicochemical parameters.

Parameters	Control and Colostrum Sita Bhog				F value	C.D.
	T ₀	T ₁	T ₂	T ₃		
Fat	12.00	10.75	11.27	11.56	27.8*	0.30
Total Solids	67.0	68.40	67.8	66.40	2.27**	-
Protein	3.41	4.77	4.49	4.22	309.72*	0.102
Acidity	0.15	0.20	0.18	0.17	41.25*	0.011
Moisture	33.0	31.6	32.2	33.6	2.27**	-
Yield	27.82	29.72	28.54	28.23	22.50*	0.50

* Significant at 5 % level

** Non-significant at 5 % level

Total solids

There were significant differences found in the protein content of different treatments. T₁ (4.77) is the highest, followed by T₂ (4.49), T₃ (4.22) and T₀ (3.41). F value was 2.27, indicating no significant effect of treatment on total solids. The differences in these were non-significant.

Acidity

The acidity percentage of different treatments also differed significantly. The highest acidity percentage was found in T₁ (0.18), followed by T₂ (0.16), T₃ (0.14) and T₀ (0.12). F value was 41.25, indicating significant effect of treatment on acidity.

Yield

The maximum yield of Sita Bhog (29.72) was obtained for treatment T₁ followed by T₂ (28.54) and T₃ (28.23), whereas the minimum yield (27.82) was found in T₀. There was significant difference found in average yield (%) of control and experimental samples. F value was 22.50, indicating significant effect of treatment on yield. Thus, the data showed the experimental product was as good as control.

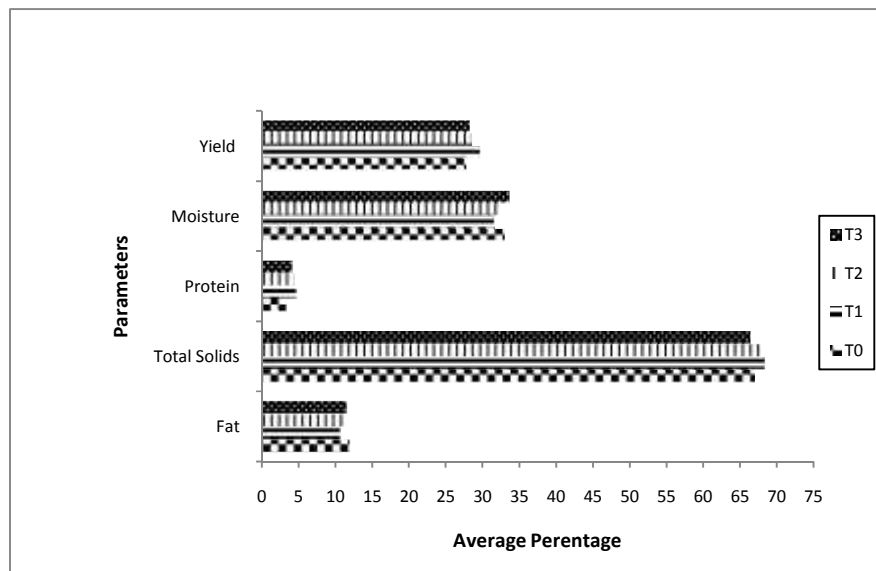


Figure 2: Average of different physicochemical parameters and yield of Control and Colostrum Sita Bhog.

Microbial Parameters of Control and Colostrum Sita Bhog

There were no significant differences found among the treatments for SPC. The highest value was found in T₁ (8.40), followed by T₂ (8.00), T₃ (7.60) and T₀ (7.40). Yeast and mould count also were non-significant. The highest value was found in T₁ (4.60), followed by T₂ (4.00), T₃ (3.60) and T₀ (2.80). All the samples did not have any coliform.



Table-2: Microbial parameters of Control and Colostrum Sita Bhog

Parameters	Control and Colostrum Sita Bhog				F value	C.D.
	T ₀	T ₁	T ₂	T ₃		
SPC(10 ³)cfu/g	7.40	8.40	8.00	7.60	2.80**	-
Yeast and mold (10 ²)cfu/g	2.80	4.60	4.00	3.60	1.95**	-
Coliform count(10 ¹)cfu/g	Nil	Nil	Nil	Nil	Nil	Nil

* Significant at 5 % level

** Non-significant at 5 % level

CONCLUSION

On the basis of results obtained it can be concluded that colostrum can be successfully used for preparation of good quality 'Sita Bhog', without sacrificing its palatability and therapeutic value.

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