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Study of wood apple blended Shrikhand

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Abstract

A study was undertaken to evaluate the effect of wood apple pulp on the quality attributes of Shrikhand. The pulp combination was incorporated at 0%, 5%, 10% and 15% level (replacing chakka) into the formulation of shrikhand. The proximate composition, physico-chemical and sensory properties were analyzed. Amongst the different physico-chemical parameters, a significant decrease in the total solids, fat, protein, carbohydrate and ash percent of the Shrikhand was observed with increasing level of pulp combination. On the basis of various sensory parameters, Shrikhand containing 15% pulp combination was selected as optimum. The pulp combination had a significant influence on colour and appearance, consistency, flavour and taste and overall acceptability of the Shrikhand. Wood apple pulp can be successfully incorporated in the preparation of Shrikhand without adversely affecting the quality of the product.

Keywords: Shrikhand, wood apple pulp, organoleptic evaluation, compositional analysis

Introduction

Shrikhand is a semi-soft, sweetish sour, whole milk product prepared from lactic acid fermented curd. The curd is partially strained through a muslin cloth to remove the whey to produce a solid mass called chakka. This chakka is mixed with the required amount of sugar to yield Shrikhand (De, 1982) [2]. The dish is very popular in Gujarat, Maharashtra and Karnataka. The Shrikhand word is derived from the Sanskrit root 'shrikha rani' meaning good nourishing food having high protein and calorific value.

Present day consumers prefer foods that promote good health and prevent diseases. Low fat fermented product play an important role in synthesis of vitamin B complex in human body and in the prevention of abdominal diseases (Sonawane *et al.*, 2007) [12] and is recommended as health food for specific patients suffering from obesity and cardiovascular disease (Kumar *et al.*, 2011) [7].

Wood apple has promising therapeutic value because of the presence of various phyto constituents such as tannins, alkaloids, steroids, flavonoids, terpenoids, fatty acids and vitamins.

It has laxative effects. Wood Apple include relief from constipation, indigestion, peptic ulcer, piles, respiratory problems, diarrhea, and dysentery. It also boosts the immune system, fights off bacterial and viral infections, reduces inflammation and various inflammatory conditions, prevent cancer, increases milk production for nursing mothers, cures diabetes, increases ocular health, and helps prevent various sexual dysfunctions.

Some workers have attempted to improve the sensory and nutritive characteristics of Shrikhand by adding fruit pulp. (Nigam *et al.*, 2009) [8] have studied the effect of papaya pulp on the quality characteristics of Shrikhand.

The present investigation was undertaken to explore the possibility of the use of wood apple pulp in shrikhand to produce a novel fermented milk product.

Materials and Methods

Treatment Details

Shrikhand was prepared from buffalo milk chakka. Sugar was added in chakka @35% as per weight of chakka. After that Shrikhand was poured into plastic containers and then stored at refrigeration temperature (5-7 °C)

Procurement and collection of ingredients

Buffalo milk: Buffalo milk was collected from local market of Allahabad.

Wood apple pulp: It was collected from local market of Allahabad.

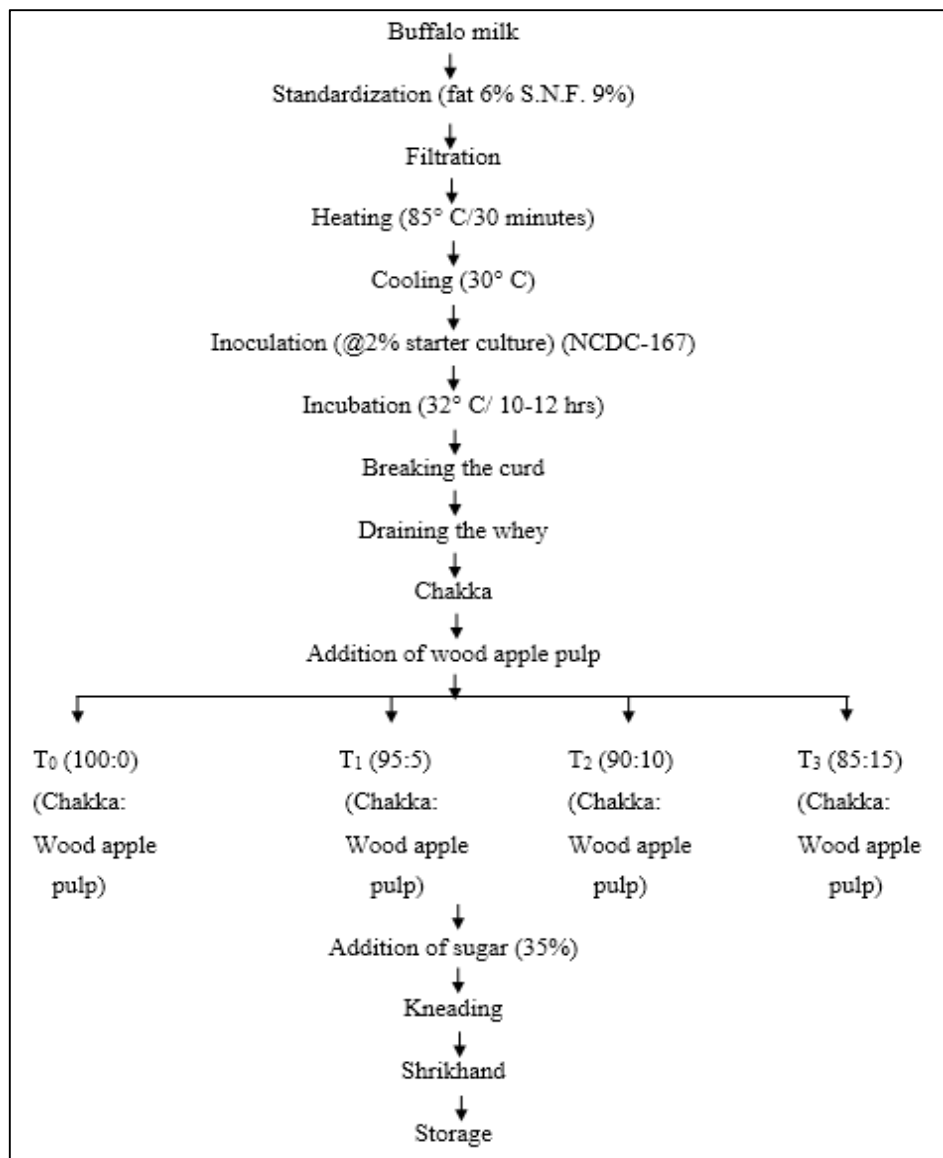
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Sugar: Sugar was collected from local stores of Allahabad.
Starter culture: Starter culture was collected from NCDC, NDRI, Karnal.

Methods used for Preparation of Shrikhand
 Shrikhand was manufactured as suggested by (Singh & Chandra, 1997)^[10] was used with slight modifications.



Flow chart for preparation of control and wood apple pulp blended shrikhand

Organoleptic evaluation

Shrikhand blended with wood apple pulp was served to panel members consisting of 6 experienced persons using 9-point hedonic scale (Amerine *et al.*, 1965)^[1]

Compositional analysis

The Shrikhand was analysed for total solids, fat, protein, carbohydrate, ash and titratable acidity. Total solids of Shrikhand blended with wood apple pulp was determined by gravimetrically as per the procedure for milk laid down in IS 2802, 1964. The fat percentage of shrikhand was determined as per procedure laid down in IS: 1166-1973. Determination of protein was done as per the procedure suggested by Maneffee and Overman (1940). Determination of carbohydrate was done according to SP: 18, Part XI, 1981. Determination of ash content was done as per the procedure laid down in IS: 5962, 1970. Determination of titratable acidity was done according to IS: 1166-1973.

Statistical analysis

The data obtained were statistically analyzed by MS Excel software.

Results and Discussion

Initial quality of buffalo milk

The flavor, appearance and colour of the milk sample was normal. The mean values of fat, protein, lactose and ash for buffalo milk were 6.0±0.04 percent, 3.8±0.07 percent, 4.8±0.06 percent, and 0.8±0.05 percent respectively (Table 1). The fat and SNF content of buffalo milk used for the preparation of shrikhand was within the prescribed limit.

Initial quality of wood apple pulp

The fat (%), protein (%), carbohydrate (%) and ash (%) of wood apple pulp sample were 0.20±0.03, 1.6±0.18, 30.6±0.36 and 1.3±0.21 respectively (Table 1).

Table 1: Chemical composition of buffalo milk and wood apple pulp (Mean±SE)*.

Parameters	Fat (%)	Preotein (%)	Carbohydrate (%)	Ash (%)
Buffalo milk	6.0±0.04	3.8±0.07	4.8±0.06	0.8±0.05
Wood apple pulp	0.20±0.03	1.6±0.18	30.6±0.36	1.3±0.21

*Average of five trials.

Quality of Shrikhand

Physical parameters

The score of colour & appearance, consistency, flavour & taste as well as the overall acceptability of different types of Shrikhand were compiled in Table 2. It was observed that the individual and total score of physical parameters were

significantly increased when 5% wood apple pulp added to Shrikhand. These properties could further be increased significantly by increasing the level upto 15%. The result of this experiment shows that physical properties of wood apple blended shrikhand was higher than that of control shrikhand.

Table 2: Summary of the results of physical evaluation of different Shrikhand samples (Mean±SE)*.

Parameters	Types of Shrikhand			
	T ₀	T ₁	T ₂	T ₃
Colour & Appearance	8.21±0.04	8.30±0.03	8.32±0.04	8.54±0.05
Consistency	8.11±0.03	8.18±0.04	8.20±0.05	8.48±0.06
Flavour & Taste	8.18±0.05	8.26±0.04	8.29±0.03	8.53±0.05
Overeall Acceptability	8.13±0.05	8.17±0.04	8.25±0.06	8.51±0.04

*Average of five trials.

Chemical parameters

The total solids (%), fat (%), protein (%), carbohydrate (%), ash (%) and acidity (%) of different types of Shrikhand were compiled in Table 3. A significantly decreasing trend was observed in the fat, protein, carbohydrate and ash content of Shrikhand with increasing level of the pulp combination. The

probable reason may be due to the lower protein, fat and ash content of the pulp combination in comparison to the chakka. Similar results were obtained (Kumar *et al.*, 2011) [7] in Shrikhand prepared by using apple pulp. Similar observations were also reported in papaya pulp incorporated Shrikhand (Nigam *et al.*, 2009) [8].

Parameters	Types of Shrikhand			
	T ₀	T ₁	T ₂	T ₃
Total Solids (%)	60.49±0.38	59.12±0.27	57.79±0.30	56.27±0.28
Fat (%)	13.62±0.04	12.93±0.03	12.30±0.05	11.60±0.04
Protein (%)	7.48±0.07	7.16±0.04	6.91±0.06	6.6±0.03
Carbohydrate (%)	38.51±0.34	38.21±0.29	37.81±0.28	37.33±0.32
Ash (%)	0.88±0.02	0.82±0.01	0.77±0.03	0.74±0.02
Titratable acidity (%)	0.83±0.03	0.90±0.02	1.0±0.04	1.15±0.05

*Average of five trials.

Microbiological Analysis

The coliform count for optimized product was analysed and it was found to be absent.

Conclusion

From this study, it is clear that addition of wood apple pulp to Shrikhand is increasing the physical quality but somewhat deviation occurs in case of chemical properties. Shrikhand blended with 15% wood apple pulp scored highest sensory score for all the sensory parameters studied. Value addition also improved firmness and flavour of Shrikhand. It may be concluded that good quality, value added Shrikhand with more acceptability be prepared by addition of wood apple pulp.

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