



Research Article

EVALUATION OF THE RHEOLOGICAL PROPERTIES OF HERBAL SWEET CURD

SINGH RAJVIR AND DAVID JOHN*

Warner College of Dairy Technology, Sam Higginbottom University of Agriculture Technology and Sciences, Allahabad, 211007, India

*Corresponding Author: Email - jaimanrs74@gmail.com

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Abstract- Sweet curd is a traditional Indian fermented sweet savory milk product prepared from partially concentrated sweetened milk, on the basis of lactic acid, diacetyl and acetyl methyl carbinol production and pH and curd tension measurements, the LF-40 culture was found to be the most suitable for commercial production of Sweet curd. Rheological properties of sweet curd were Analyzed by taking Cohesiveness, Consistency and Index of viscosity of herbal sweet curd. The highest cohesiveness was recorded in T0 and maximum consistency was recorded in treatment B0A1. The highest index of viscosity was recorded in treatment B3A1 and minimum was observed in T0. In most of the treatment combinations Cohesiveness, Consistency and index of viscosity differed significantly.

Keywords- Rheological properties, Sweet curd, Aswagandha, Brahmi

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Introduction

Demand of sweet curd is increasing day by day because of an increased awareness of consumers regarding possible health benefits. It is used directly either sweetened or salted and spiced form and also consumed with other foods such as rice and chapatti. Sweet curd is taken once or twice a day at morning or evening meals. It is consumed more in summer than in winter. Sweet curd is consumed by the rich and poor alike. Because of an increased awareness of consumers regarding possible health benefits of sweet curd. Sweet curd is easily digested, and is a rich source of carbohydrates, protein, fat, vitamins, calcium, and phosphorus, as milk protein, fat, and lactose components undergo partial hydrolysis during fermentation. Mishti Doi is a fermented milk product with yellowish or creamish color with firm consistency, smooth texture and pleasant aroma [1]. There were no available PFA standards for Mishti Doi. There are different grades of Mishti Doi available in the market such as low fat, medium and high fat. Physico-chemical, sensory, and textural Properties of mishti dahi prepared from reduced fat buffalo milk [2]. Mishti Doi is also called as payodhi or lal Dahi and is a popular product in the eastern parts of India, mostly West Bengal, where it is served with meal as a dessert. Mishti Doi is consumed on festive occasions and is considered auspicious item to serve while starting for journey or any important work. It is generally packaged in earthen pots [3]. *Withania somnifera* Ounal, commonly known as Ashwagandha" is well known for its therapeutic use in the ayurvedic system of traditional medicine. However, there is no report of antibacterial activity of *W. somnifera* [4]. *Bacopa* is the genus in which the well-known Indian medicinal plant Brahmi (*Bacopa monnieri*) is included [5]. Three of the most common allied species of brahmi is *Bacopa monnieri*, *Bacoparepens* and *B. Carolinian*. The common enzyme sequence available in the NCBI data bank. They studied physico-chemical parameters like amino acid frequency, isoelectric point, aliphatic index, GRAVY, charges, extinction coefficient, hydrophobicity and antigenicity. [6] The domains in the protein and their secondary structure along with peptide sequence and trans membrane sequences also predicted. The glycosylation site and protein kinase C phosphorylase site predicted correctly. Storage intervals showed significant effect on rheological and sensory characteristics of yogurts.

Mean scores for viscosity, flavor, texture, appearance and taste decrease significantly with increasing storage while firmness increased. Yogurt prepared from buffalo milk yogurt showed better rheological properties (more viscosity and firmness) than cow milk yogurt [7].

Materials and Method

The experiment was carried out in the lab of Student Training Dairy Plant, Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology & Sciences, Allahabad, U.P. India. Following steps are involve to carried out the present study.

Rheological Analysis

Rheological properties of herbal sweet curd were analysed by:

- a) Cohesiveness
- b) Consistency
- c) Index of viscosity

Result and Discussion

[Table-1] showed observation of mean value of cohesiveness that the maximum cohesiveness (470.16 gm/sec.) was recorded in T0, followed by B0A1(382.56), B0A3(364.50) and B0A0(350.48) and minimum was recorded in B2A1 i.e. (211.26 gm./sec.).

In most of the treatment combinations cohesiveness differed significantly. The highest consistency (2477.81) was recorded in treatment B0A1, followed by T0 (2418.97), B0A0 (2351.75) and in B0A2 (2325.94) and minimum was observed in treatment B2A3 i.e. (1690.35 gm. /sec.). In most of the treatment combinations consistency differed significantly [Table-2].

[Table-3] indicated the highest index of viscosity (40.51 gm./sec.) was recorded in treatment B3A1, followed by B3A3(39.17), B3A0(38.21) and B3A2(37.83) and minimum was recorded in control T0 i.e., (16.04 gm./sec.). In most of the treatment combinations index of viscosity differed significantly.

Table-1 Observation of Cohesiveness (gm. sec.) of herbal sweet curd.

Treatments	R ₁	R ₂	R ₃	R ₄	R ₅	Mean
T ₀	470.20	470.10	470.10	470.20	470.20	470.16
B ₀ A ₀	346.70	346.40	366.40	346.40	346.50	350.48
B ₀ A ₁	382.60	382.50	382.50	382.60	382.60	382.56
B ₀ A ₂	303.40	303.40	303.40	303.30	303.30	303.36
B ₀ A ₃	364.50	364.50	364.50	364.50	364.50	364.50
B ₁ A ₀	313.90	313.90	313.80	313.80	313.90	313.86
B ₁ A ₁	349.10	349.10	349.20	349.20	349.20	349.16
B ₁ A ₂	324.10	324.10	324.20	324.30	324.30	324.20
B ₁ A ₃	233.10	233.10	233.10	233.20	233.10	233.12
B ₂ A ₀	256.20	256.10	256.10	256.20	256.10	256.14
B ₂ A ₁	211.30	211.30	211.20	211.20	211.30	211.26
B ₂ A ₂	232.20	232.20	232.30	232.30	232.30	232.26
B ₂ A ₃	232.40	223.40	273.20	223.50	223.50	235.20
B ₃ A ₀	273.40	273.40	216.90	273.20	273.20	262.02
B ₃ A ₁	216.90	216.90	234.50	216.97	216.97	220.45
B ₃ A ₂	243.50	234.50	234.50	234.50	234.40	236.28
B ₃ A ₃	235.10	235.10	235.20	235.20	235.20	235.16
Mean	293.45	292.35	294.18	292.39	292.39	292.95
Minimum	211.30	211.30	211.20	211.20	211.30	211.26
Maximum	470.20	470.10	470.10	470.20	470.20	470.16
F- test				S		
S. Ed. (±)				5.586		
C.D. (P 0.05)				11.159		

Table-2 Observation of Consistency (gm.sec.) of herbal sweet curd.

Treatments	R ₁	R ₂	R ₃	R ₄	R ₅	Mean
T ₀	2624.47	2404.56	2404.50	2256.77	2404.56	2418.97
B ₀ A ₀	2404.52	2341.11	2341.11	2330.91	2341.11	2351.75
B ₀ A ₁	2330.91	2624.47	2624.47	2184.74	2624.47	2477.81
B ₀ A ₂	2256.77	2330.91	2330.91	2380.19	2330.91	2325.94
B ₀ A ₃	2184.74	2256.77	2256.77	2021.63	2256.77	2195.34
B ₁ A ₀	2380.19	2184.74	2184.74	1813.81	2184.74	2149.64
B ₁ A ₁	2021.63	2380.19	2380.19	1875.91	2380.19	2207.62
B ₁ A ₂	1813.81	2021.63	2021.63	2057.61	2021.63	1987.26
B ₁ A ₃	1875.93	1813.81	1813.82	1582.62	1813.81	1780.00
B ₂ A ₀	2057.61	1875.91	1875.91	1797.32	1875.91	1896.53
B ₂ A ₁	1582.62	2057.61	2057.61	1562.82	2057.61	1863.65
B ₂ A ₂	1797.32	1582.62	1582.63	2172.57	1797.32	1786.49
B ₂ A ₃	1562.82	1797.32	1797.32	1731.46	1562.82	1690.35
B ₃ A ₀	2172.57	1562.82	1562.82	1756.52	2172.57	1845.46
B ₃ A ₁	1797.82	2172.57	2172.57	2172.57	1797.82	2022.67
B ₃ A ₂	1731.46	1731.46	1731.46	1797.82	1731.46	1744.73
B ₃ A ₃	1756.52	1756.52	1756.52	1731.46	1756.52	1751.51
Mean	2020.69	2052.65	2052.65	1954.51	2065.31	2029.16
Minimum	1562.82	1562.82	1562.82	1562.82	1562.82	1690.35
Maximum	2624.47	2624.47	2624.47	2380.19	2624.47	2477.81
F- test				S		
S. Ed. (±)				106.482		
C.D.(P=0.05)				212.722		

Conclusion

On the basis of above-mentioned analytical results, it can be concluded that Organoleptic evaluation show that herbal sweet curd of B3A3 Ashwagandha powder and Brahmi powder prepared from whole milk having 6% fat and 9% SNF with addition of 6% sugar and 2.5% culture found to be more acceptable samples with good colour flavor, aroma, taste, mouth feel and overall acceptability.

Application of research: The chemical properties of different treatments of product varied to great extent microbiological were found to be satisfactory, whereas the prepare herbal sweet curd was acceptable on the basis of microbial load.

Research Category: Dairy Technology

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Research project name or number: PhD Thesis

Table-3 Observation of Index of viscosity (gm.sec.) of herbal sweet curd.

Treatments	R ₁	R ₂	R ₃	R ₄	R ₅	Mean
T ₀	16.05	16.03	16.03	16.05	16.05	6.04
B ₀ A ₀	21.59	21.59	21.59	21.59	21.59	21.59
B ₀ A ₁	23.78	23.78	23.78	23.78	23.78	23.78
B ₀ A ₂	27.51	27.51	27.51	27.51	27.51	27.51
B ₀ A ₃	24.16	24.16	24.16	24.16	24.16	24.16
B ₁ A ₀	22.17	22.17	22.17	22.17	22.17	22.17
B ₁ A ₁	27.47	27.47	27.47	27.47	27.47	27.47
B ₁ A ₂	12.25	17.79	17.74	17.74	17.74	16.65
B ₁ A ₃	35.24	12.52	12.25	12.25	12.25	16.90
B ₂ A ₀	40.24	35.24	35.24	35.24	35.24	36.24
B ₂ A ₁	27.63	40.24	40.24	40.24	24.02	34.47
B ₂ A ₂	32.89	27.63	27.64	27.64	27.64	28.69
B ₂ A ₃	35.34	32.89	32.89	32.89	32.89	33.38
B ₃ A ₀	42.52	35.34	35.34	35.34	42.52	38.21
B ₃ A ₁	37.51	42.52	42.50	42.52	37.51	40.51
B ₃ A ₂	39.08	37.51	37.51	37.51	37.52	37.83
B ₃ A ₃	39.54	39.08	39.08	39.08	39.08	39.17
Mean	29.70	28.44	28.42	28.42	27.60	28.52
Minimum	12.25	12.52	12.25	12.25	12.25	16.04
Maximum	42.52	42.52	42.50	42.52	42.52	40.51
F- test				S		
S. Ed. (±)				2.240		
C.D.(P=0.05)				4.474		

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Study area / Sample Collection: Dairy Plant, Warner College of Dairy Technology, Allahabad, 211007, India

Conflict of Interest: None declared

Ethical approval: This article does not contain any studies with human participants or animals performed by any of the authors.

Ethical Committee Approval Number: Nil

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