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To optimize the level of ashwagandha (*Withania somnifera*) powder and brahmi (*Bacopa monnieri*) powder for preparation of herbal sweet curd

Singh Rajvir and David John

Abstract

Sweet curd (Mishti doi) local named Dahi is considered as additional fermented milk product and also a functional food as it is nutritional and therapeutically beneficial for human being Ashwagandha (*Withania somnifera*) and Brahmi (*Bacopa monnieri*) powder are well known for their medicinal importance and used as brain tonic to enhance memory in ayurvedic system of medicine. Herbal sweet curd prepared with the powder of Ashwagandha and Brahmi Leads the increasing amount of physico-chemical composition in different treatment combinations.

Keywords: Ashwagandha, Brahmi and herbal sweet curd etc

Introduction

The use of fermented milks dates back to many centuries, although there is no precise record of the date when they were first made The milk which could not be preserved overnight in a tropical environment led the Aryans to benefit with the phenomenon of fermentation having known for its nutritional and therapeutic benefits. The Aryans have embraced dahi as a natural healthful delicacy for their diet. Initially the souring of milk was done by natural fermentation with the advent of science of bacteriology and nutrition. Fermentation process emerged as a well-developed controlled sequence of changes in milk with the use of selective microorganisms. Selective organism produces lactic acid and may impart other beneficial effect to the product. The use of different microorganisms led the development of a wide range of milk products viz. dahi, yoghurt, Shrikhand, lassi, kefir, koumiss, yakult, laben, etc. In India dahi is being produced with varieties of taste varying with region-to-region and individual food habits.

Sweet curd is a traditional Indian fermented sweet savory milk product prepared from partially concentrated sweetened milk. Lactic cultures viz. *Streptococcus lactis*, *S. diacetylactis*; *S. cremoris*; *S. thermophilus*; *Lactobacillus bulgaricus* were examined for their ability to grow in a concentrated, sweetened milk system (18% milk solids and 14% sucrose). 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. 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. The consumption depends upon availability of the product, individual food habits and locality. The medicinal plants contain several phytochemicals such as Vitamins (A, C, E, and K), Carotenoids, Terpenoids, Flavonoids, Polyphenols, Alkaloids, Tannins, Saponins, Enzymes, and Minerals etc. These phytochemicals possess antioxidant activities which can be used in the treatment of multiple ailments.

Withania somnifera (Family: Solanaceae) is a popular Indian medicinal plant and is also known Ashwagandha ginseng and winter cherry. It has been an important herb in the ayurvedic and indigenous medical system for over 3000 years. Numerous studies indicated that Ashwagandha possesses antioxidant, antitumor, anti-stress, anti-inflammatory, immunomodulatory, hematopoietic, anti-ageing, anxiolytic, anti-depressive, rejuvenating properties and also influences various neurotransmitter receptors in the central nervous system. In recent studies done on human breast, lung and colon cancer cell lines, plant extracts inhibited the growth of these cell lines. Veena Sharma *et al.* (2011) [11] they used to compare it with 5 studies revealed that the anti-inflammatory and immune modulatory properties of *Withania somnifera* root extracts are likely to contribute to the chemo preventive action. It is in use for a very long time for all groups and both sexes and even during pregnancy without any side effects.

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Bacopa monnieri commonly known as “Brahmi” are used in the ayurvedic system of medicine for centuries. Earlier, it used as brain tonic to enhance memory development, learning and concentration and to provide relief to patients with anxiety or epileptic disorders. Brahmi contains major constituents such as desaponins glycosides-triterpenoid saponins (Bacosides A and B). it also includes other minor constituents saponins, bacosides A 1 & A3 hersaponin, betulic acid, monnirin 14, alkaloids, herpestine and Brahmine 15, flavonoids 16, luteolin 7- glucoside, glucoronyl -7-apigenin and glucoronyl-7 luteonin, common phytosteroids.

Review of Literature

Sweet Curd

Antunes *et al.*, (2004) ^[1] observed chemical, physical, microstructural and sensory properties of set fat free yoghurt stabilize with whey protein concentrate.

Kumar and Mishra, (2004) ^[5] The Prevention of Food Adulteration (PFA) Act defines Dahi as ‘a semi-solid product’, obtained from pasteurized or boiled milk by souring using harmless lactic acid or other bacterial cultures. Dahi may contain additional cane sugar. It should have the same minimum percentage of fat and solid-not-fat (SNF) as the milk from which it has been prepared.

Harun-Ur-Rashid *et al.*, (2006) Dahi is consumed as such and also used as an intermediate product for many other products based on milk, such as buttermilk (Chhach) which is largely used as thirst quencher in summer? In eastern part of India Dahi is used as Mishti Doi/Dahi by adding sweetener such as jaggery, caramelized flavor and color to the Dahi. Dahi is prepared traditionally in almost every kitchen in India.

Yadav *et al.*, (2007) ^[6] Dahi is the local name of the curd. It is considered as traditional fermented milk product and also a functional food as it is nutritionally and therapeutically beneficial for human beings.

Raju and Pal, (2009) ^[3] Mishti Doi is a fermented milk product with yellowish or creamish color with firm consistency, smooth texture and pleasant aroma. 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 fat and high fat.

Rautray and Mishra, (2011) Dahi normally contains no added sugar or flavour. Consumers can add sugar and flavour in Dahi according to their choice. Dahi can also be used for dressing of salads of fresh fruits and grated vegetables.

Obidul *et al.*, (2012) ^[8] examined quality assessment of sweet curds (Misti Dahi) from two selected areas of Bangladesh.

Tamang, (2016) ^[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.

Prasad Rasane *et al.*, (2017) ^[4] fermented dairy products like Dahi (curd), Mishti Doi (sweetened curd).

Ashwagandha

According to Bhattacharya, S.K *et al.*, (1994) ^[12] Ashwagandha (*Withania somnifera*) is reported to be general tonic, antistress, hepato-protective, haematinic, growth promoter, antioxidant in human practice The use of herbal medicines or medicinal plants as feed additives can avoid widespread abuse of many diseases and disturbed occurrence of hormones, antibiotics etc. in humans.

Lokhandeet, (2001) reported that *Withania somnifera* Dunal (Ashwagandha) has immunostimulatory properties, exerts a positive influence on the endocrine, cardiopulmonary and central nervous system and improve memory. Ravishanker *et al.*, (2007) found that medicinal plants based traditional systems of medicines are playing important role in providing health care to large section of population, especially in developing countries. Interest in them and utilization of herbal products produced based on them is increasing in developed countries also. Shoma Paul Nandi *et al.*, (2011) the plant *Withania somnifera*. Ounal, commonly known as Ashwagandha" is well known for its therapeutic use in the ayurvedic system of traditional medicine. It has been used as an antibacterial, antioxidant, adaptogen, aphrodisiac, liver tonic, anti-inflammatory agent. However there is no report of antibacterial activity of *W. somnifera*.

Brahmi

According to Krishna, *et al.*, (2011) in recent times, the use of herbal products has increased tremendously in the western world as well as in developed countries. One of the important medicinal plants, widely used therapeutically in the orient and becoming increasingly popular in the west is *Bacopa monnieri*, a well-known no tropic herb. The present review summarizes current knowledge of pharmacological actions, major bioactive(s), reported mechanisms of actions and the possibility of interactions of the herb with the conventional drugs.

Materials and Methods

Experimental site

The experiment Process optimization of herbal sweet curd by incorporating Bramhi and Ashwagandha extract, 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-211007.

Details of experimental technique were as follows:

1. Procurement of ingredients

- Bramhi powder was collected from the local market
- Ashwagandha powder was collected from the local market.
- Milk was collected from Aggies - Dairy plant.
- Sugar was collected from the local market.
- Culture was collected from NDRI Kamal.

2. Chemical Analysis of control and experimental sweet curd

- Fat percentage by Gerbar and AOAC method 1990.
- Protein percentage by Kjeldhal's method 1983.
- T.S. percentage determined by method described in 15:1479(1960).
- Moisture percentage determined as per laid down in manual in Dairy chemistry (1972).
- Ash percentage by AOAC method 2000.
- % Acidity and Carbohydrate (% L.A.) by AOAC method 2000.
- Antioxidant activity the DPPH Scavenging activity assay was elucidated by the method of Apostolidis *et al.* (2006) (Appendix III).

3. Microbiological Analysis (At an interval of 0, 3, 6 and 9 days)

- Yeast, mould count and Coli form test
- Microbiological testing of herbal sweet curd was determined as per the procedure given in “Manual in Dairy Bacteriology” ICAR (1972).

4. Sensory evaluation Color, Appearance, Body, texture, Flavor & taste

5. Rheological Analysis a) Cohesiveness b) Consistency c) Index of viscosity

Preparation of Sweet Curd

Traditional method of preparation

Mishti Doi is traditionally prepared from cow milk or buffalo

milk or a combination there of Cane sugar is mixed in the whole milk and the filtered mix is allowed to simmer at 60-70°C in iron Karahi. The prolonged heat treatment causes concentration of milk (volume reduced to 60-70 per cent of the original volume) and development of characteristic cooked flavour and brown colour. The concentrated mix is cooled and transferred in earthen pots and inoculated with the previous day's product. It is incubated at room temperature for 15-16 hours. (Ray and Srinivasan. 1972; De. 1980)^[9].

Table 1: Carbohydrate (%) of herbal sweet curd

Treatments	R ₁	R ₂	R ₃	R ₄	R ₅	Mean
T ₀	16.02	16.76	16.51	16.57	16.93	16.56
B ₀ A ₀	16.86	16.30	16.55	16.61	16.57	16.58
B ₀ A ₁	16.54	16.58	16.53	16.59	16.55	16.56
B ₀ A ₂	16.56	16.60	16.55	16.61	16.57	16.58
B ₀ A ₃	16.50	16.54	16.49	16.55	16.51	16.52
B ₁ A ₀	16.50	16.54	16.49	16.55	16.51	16.52
B ₁ A ₁	16.49	16.53	16.48	16.54	16.50	16.51
B ₁ A ₂	16.54	16.58	16.53	16.59	16.55	16.56
B ₁ A ₃	16.53	16.57	16.52	16.58	16.54	16.55
B ₂ A ₀	16.58	16.62	16.57	16.63	16.59	16.60
B ₂ A ₁	16.60	16.64	16.59	16.65	16.61	16.62
B ₂ A ₂	16.61	16.65	16.60	16.66	16.62	16.63
B ₂ A ₃	16.63	16.67	16.62	16.68	16.64	16.65
B ₃ A ₀	16.68	16.72	16.67	16.73	16.69	16.70
B ₃ A ₁	16.70	16.74	16.69	16.75	16.71	16.72
B ₃ A ₂	16.71	16.75	16.70	16.76	16.72	16.73
B ₃ A ₃	16.72	16.76	16.71	16.77	16.73	16.74
Mean	16.57	16.62	16.58	16.64	16.62	16.61
Minimum	16.02	16.30	16.48	16.54	16.50	16.51
Maximum	16.86	16.76	16.71	16.77	16.93	16.74
F- test				S		
S. Ed. (±)				0.062		
C. D. (P = 0.05)				0.124		

The highest carbohydrate (16.74) was recorded in B₃A₃ and followed by B₃A₂ (16.73), B₃A₁ (16.72), B₃A₀ (16.7), B₂A₃ (16.65), B₂A₂ (16.63), B₂A₁ (16.62), B₂A₀ (16.6), B₀A₀ (16.58), B₀A₂ (16.58), T₀ (16.56), B₁A₃ (16.55), B₀A₃ (16.52), B₁A₀ (16.52) and minimum was B₁A₁ (16.51). In most of the treatment combinations carbohydrate differed significantly.

Table 2: Protein (%) of herbal sweet curd

Treatments	R ₁	R ₂	R ₃	R ₄	R ₅	Mean
T ₀	3.00	3.50	3.40	3.40	3.60	3.38
B ₀ A ₀	3.86	3.05	3.46	3.44	3.45	3.45
B ₀ A ₁	3.49	3.47	3.47	3.48	3.48	3.48
B ₀ A ₂	3.50	3.48	3.47	3.48	3.48	3.48
B ₀ A ₃	3.70	3.50	3.50	3.50	3.50	3.54
B ₁ A ₀	3.50	3.70	3.70	3.60	3.80	3.66
B ₁ A ₁	3.65	3.70	3.60	3.70	3.80	3.69
B ₁ A ₂	3.60	3.74	3.65	3.72	3.78	3.70
B ₁ A ₃	3.80	3.60	3.70	3.67	3.80	3.71
B ₂ A ₀	3.50	3.80	3.70	3.90	3.80	3.74
B ₂ A ₁	3.75	3.74	3.82	3.65	3.80	3.75
B ₂ A ₂	3.60	3.58	3.76	3.75	3.85	3.71
B ₂ A ₃	3.80	3.69	3.75	3.80	3.70	3.75
B ₃ A ₀	3.50	3.80	3.70	3.80	3.90	3.74
B ₃ A ₁	3.74	3.68	3.73	3.88	3.85	3.78
B ₃ A ₂	3.70	3.77	3.76	3.77	3.88	3.78
B ₃ A ₃	3.70	3.80	3.80	3.85	3.83	3.80
Mean	3.61	3.62	3.65	3.67	3.72	3.65
Minimum	3.00	3.05	3.40	3.40	3.45	3.38
Maximum	3.86	3.80	3.82	3.90	3.90	3.80
F- test				S		
S. Ed. (±)				0.074		
C. D. (P = 0.05)				0.148		

The highest protein B₃A₃ (3.80), followed by B₃A₁ (3.78), B₃A₂ (3.78), B₂A₁ (3.75), B₂A₃ (3.75), B₂A₀ (3.74), B₃A₀ (3.74), B₁A₃ (3.71), B₂A₂ (3.71), B₁A₂ (3.70), B₁A₁ (3.69), B₁A₀ (3.66), B₀A₃ (3.54), B₀A₁ (3.48), B₀A₂ (3.48), B₀A₀ (3.45) and minimum was T₀ (3.38). In most of the treatment combinations protein differed significantly.

Table 3: Acidity (%) of herbal sweet curd

Treatments	R ₁	R ₂	R ₃	R ₄	R ₅	Mean
T ₀	0.68	0.72	0.70	0.70	0.72	0.70
B ₀ A ₀	0.76	0.70	0.72	0.65	0.71	0.71
B ₀ A ₁	0.60	0.66	0.60	0.60	0.70	0.63
B ₀ A ₂	0.62	0.63	0.62	0.62	0.63	0.62
B ₀ A ₃	0.73	0.63	0.61	0.63	0.62	0.64
B ₁ A ₀	0.63	0.65	0.65	0.63	0.63	0.64
B ₁ A ₁	0.65	0.65	0.65	0.62	0.63	0.64
B ₁ A ₂	0.64	0.68	0.67	0.63	0.61	0.65
B ₁ A ₃	0.65	0.62	0.63	0.70	0.63	0.65
B ₂ A ₀	0.72	0.72	0.72	0.72	0.70	0.72
B ₂ A ₁	0.73	0.73	0.72	0.71	0.73	0.72
B ₂ A ₂	0.73	0.73	0.72	0.69	0.70	0.71
B ₂ A ₃	0.72	0.72	0.70	0.69	0.69	0.70
B ₃ A ₀	0.70	0.70	0.70	0.69	0.69	0.70
B ₃ A ₁	0.73	0.67	0.67	0.67	0.71	0.69
B ₃ A ₂	0.73	0.69	0.65	0.72	0.67	0.69
B ₃ A ₃	0.76	0.70	0.73	0.70	0.69	0.72
Mean	0.69	0.68	0.67	0.67	0.67	0.68
Minimum	0.60	0.62	0.60	0.60	0.61	0.62
Maximum	0.76	0.73	0.73	0.72	0.73	0.72
F- test				S		
S. Ed. (±)				0.016		
C. D. (P = 0.05)				0.032		

The highest acidity was recorded B₂A₀(0.72), followed by B₂A₁(0.72), B₃A₃(0.72), B₀A₀(0.71), B₂A₂(0.71), T₀(0.70), B₂A₃(0.70), B₃A₀(0.70), B₃A₁(0.69), B₃A₂(0.69), B₁A₂(0.65), B₁A₃(0.65), B₀A₃(0.64), B₁A₀(0.64), B₁A₁(0.64), B₀A₁(0.63) and minimum was B₀A₂(0.62). In most of the treatment combinations acidity differed significantly.

Table 4: Moisture (%) of herbal sweet curd.

Treatments	R ₁	R ₂	R ₃	R ₄	R ₅	Mean
T ₀	72.35	74.36	73.38	73.41	73.44	73.39
B ₀ A ₀	74.34	72.34	73.32	72.18	74.57	73.35
B ₀ A ₁	73.29	75.33	74.30	74.33	74.35	74.32
B ₀ A ₂	72.26	72.31	73.25	74.31	74.35	73.30
B ₀ A ₃	74.30	72.32	73.32	74.25	72.28	73.29
B ₁ A ₀	73.20	73.28	73.31	73.32	73.28	73.28
B ₁ A ₁	73.22	73.27	73.30	73.25	73.27	73.26
B ₁ A ₂	74.22	74.27	74.27	74.25	74.24	74.25
B ₁ A ₃	75.21	75.23	75.22	75.26	75.22	75.23
B ₂ A ₀	73.45	73.44	72.41	73.39	73.40	73.22
B ₂ A ₁	73.16	72.23	73.22	73.17	74.24	73.20
B ₂ A ₂	73.16	73.15	73.23	73.18	73.22	73.19
B ₂ A ₃	72.35	73.36	73.31	73.39	73.38	73.16
B ₃ A ₀	72.50	73.10	73.11	73.22	73.55	73.10
B ₃ A ₁	72.32	72.32	73.42	74.18	73.23	73.09
B ₃ A ₂	72.51	72.51	73.42	73.43	73.50	73.07
B ₃ A ₃	73.56	71.56	72.68	73.67	73.67	73.03
Mean	73.26	73.20	73.44	73.66	73.72	73.45
Minimum	72.26	71.56	72.41	72.18	72.28	73.03
Maximum	75.21	75.33	75.22	75.26	75.22	75.23
F- test				S		
S. Ed. (±)				0.392		
C. D. (P = 0.05)				0.784		

The highest moisture of (75.23) was recorded in B₁A₃ followed by B₀A₁(74.32), B₁A₂(74.25), T₀(73.39), B₀A₀(73.35), B₀A₂(73.30), B₀A₃(73.29), B₁A₀(73.28), B₁A₁(73.26), B₂A₀(73.22), B₂A₁(73.20), B₂A₂(73.19), B₂A₃(73.16), B₃A₀(73.10), B₃A₁(73.09), B₃A₂(73.07) and minimum was B₃A₃(73.03). In most of the treatment combinations moisture differed significantly.

Table 5: TS (%) of herbal sweet curd

Treatments	R ₁	R ₂	R ₃	R ₄	R ₅	Mean
T ₀	26.67	26.66	26.26	26.49	26.66	26.55
B ₀ A ₀	26.66	26.66	26.58	26.44	26.52	26.57
B ₀ A ₁	25.66	25.66	25.64	25.62	25.62	25.64
B ₀ A ₂	25.64	25.63	25.62	25.59	25.55	25.61
B ₀ A ₃	27.63	27.63	27.68	27.65	27.62	27.64
B ₁ A ₀	26.68	26.64	26.65	26.61	26.49	26.61
B ₁ A ₁	26.32	26.32	26.30	26.51	26.52	26.39
B ₁ A ₂	25.63	25.63	25.67	25.67	25.62	25.64
B ₁ A ₃	24.70	24.70	24.65	24.64	24.62	24.66
B ₂ A ₀	26.65	26.65	26.68	26.70	26.70	26.68
B ₂ A ₁	27.64	27.78	27.76	27.63	27.64	27.69
B ₂ A ₂	26.64	26.65	26.63	26.62	26.52	26.61
B ₂ A ₃	24.65	24.64	24.62	24.61	24.62	24.63
B ₃ A ₀	26.65	26.50	26.49	26.48	26.47	26.52
B ₃ A ₁	24.68	24.68	24.79	24.59	24.58	24.66
B ₃ A ₂	25.59	25.59	25.58	25.57	25.50	25.57
B ₃ A ₃	27.49	27.44	27.32	27.33	27.34	27.38
Mean	26.21	26.20	26.17	26.16	26.15	26.18
Minimum	24.65	24.64	24.62	24.59	24.58	24.63
Maximum	27.64	27.78	27.76	27.65	27.64	27.69
F- test				S		
S. Ed. (±)				0.045		
C. D. (P = 0.05)				0.089		

The highest TS of (27.69) was recorded in B₂A₁ followed by B₀A₃(27.64), B₃A₃(27.38), B₂A₀(26.68), B₁A₀(26.61), B₂A₂(26.61), B₀A₀(26.57), T₀(26.55), B₃A₀(26.52), B₁A₁(26.39), B₀A₁(25.64), B₁A₂(25.64), B₀A₂(25.61), B₃A₂(25.57), B₁A₃(24.66), B₃A₁(24.66) and minimum was B₂A₃(24.63). In most of the treatment combinations TS differed significantly.

Table 6: Ash (%) of herbal sweet curd

Treatments	R ₁	R ₂	R ₃	R ₄	R ₅	Mean
T ₀	0.74	0.75	0.73	0.79	0.78	0.76
B ₀ A ₀	1.10	0.72	0.73	0.89	0.85	0.86
B ₀ A ₁	0.78	0.93	0.88	0.94	1.00	0.91
B ₀ A ₂	0.95	0.99	0.94	1.00	0.96	0.97
B ₀ A ₃	0.69	1.33	0.98	1.04	1.00	1.01
B ₁ A ₀	0.92	0.96	0.91	0.97	0.93	0.94
B ₁ A ₁	0.96	1.00	0.95	1.01	0.97	0.98
B ₁ A ₂	0.99	1.03	0.98	1.04	1.00	1.01
B ₁ A ₃	1.01	1.05	1.00	1.06	1.02	1.03
B ₂ A ₀	1.04	1.08	1.03	1.09	1.05	1.06
B ₂ A ₁	1.03	1.07	1.02	1.08	1.04	1.05
B ₂ A ₂	1.05	1.09	1.04	1.10	1.06	1.07
B ₂ A ₃	1.06	1.10	1.05	1.11	1.07	1.08
B ₃ A ₀	1.17	1.01	1.06	1.12	1.08	1.09
B ₃ A ₁	1.05	1.09	1.04	1.10	1.06	1.07
B ₃ A ₂	1.00	1.00	1.00	1.06	1.08	1.03
B ₃ A ₃	1.08	1.00	1.01	1.07	1.03	1.04
Mean	0.98	1.01	0.96	1.03	1.00	1.00
Minimum	0.69	0.72	0.73	0.79	0.78	0.76
Maximum	1.17	1.33	1.06	1.12	1.08	1.09
F- test				S		
S. Ed. (±)				0.046		
C. D. (P = 0.05)				0.092		

The highest ash of (1.09) was recorded in B₃A₀ followed by B₂A₃(1.08), B₂A₂(1.07), B₃A₁(1.07), B₂A₀(1.06), B₂A₁(1.05), B₃A₃(1.04), B₁A₃(1.03), B₃A₂(1.03), B₀A₃(1.01), B₁A₂(1.01), B₁A₁(0.98), B₀A₂(0.97), B₁A₀(0.94), B₀A₁(0.91), B₀A₀(0.86) and minimum was T₀(0.76). In most of the treatment combinations ash differed significantly.

Table 7: Fat (%) of herbal sweet curd

Treatments	R ₁	R ₂	R ₃	R ₄	R ₅	Mean
T ₀	5.80	6.20	6.10	6.00	6.10	6.04
B ₀ A ₀	6.00	5.70	5.90	5.90	5.90	5.88
B ₀ A ₁	5.80	5.70	5.80	5.80	5.80	5.78
B ₀ A ₂	5.80	5.80	5.70	5.70	5.70	5.74
B ₀ A ₃	5.60	5.70	5.80	5.60	5.90	5.72
B ₁ A ₀	5.70	5.80	5.70	5.70	5.70	5.72
B ₁ A ₁	5.50	5.70	5.80	5.80	5.80	5.72
B ₁ A ₂	5.70	5.70	5.70	5.60	5.70	5.68
B ₁ A ₃	5.80	5.60	5.60	5.60	5.60	5.64
B ₂ A ₀	5.50	5.60	5.60	5.70	5.70	5.62
B ₂ A ₁	5.60	5.50	5.50	5.60	5.70	5.58
B ₂ A ₂	5.40	5.50	5.60	5.60	5.70	5.56
B ₂ A ₃	5.40	5.60	5.50	5.50	5.60	5.52
B ₃ A ₀	5.50	5.40	5.60	5.50	5.50	5.50
B ₃ A ₁	5.30	5.40	5.55	5.50	5.70	5.49
B ₃ A ₂	5.60	5.50	5.50	5.50	5.20	5.46
B ₃ A ₃	5.50	5.20	5.50	5.40	5.50	5.42
Mean	5.62	5.62	5.67	5.65	5.69	5.65
Minimum	5.30	5.20	5.50	5.40	5.20	5.42
Maximum	6.00	6.20	6.10	6.00	6.10	6.04
F- test				S		
S. Ed. (±)				0.065		
C. D. (P = 0.05)				0.130		

The highest fat (6.04), was recorded in T₀, followed by B₀A₀(5.88), B₀A₁(5.78), B₀A₂(5.74), B₀A₃(5.72), B₁A₀(5.72), B₁A₁(5.72), B₁A₂(5.68), B₁A₃(5.64), B₂A₀(5.62), B₂A₁(5.58), B₂A₂(5.56), B₂A₃(5.52), B₃A₀(5.50), B₃A₁(5.49), B₃A₂(5.46) and minimum was B₃A₃(5.42). In most of the treatment combinations FAT differed significantly.

Conclusion

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. 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.

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