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Studies on sensory attributes of herbal Sandesh from a blend of cow milk and soy milk fortified with moringa (*Moringa oleifera*) and Roselle (*Hibiscus Sabdariffa*) leaves

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Abstract

The present study was undertaken to prepare the sandesh dessert by using standard cow milk, sugar, Moringa and Roselle leaf. There was one control and 15 treatments and each was replicated five times. The control (R₀M₀) was prepared from a blend of standardized cow milk 80% (fat, 3.5% and SNF, 8.5%) and soy milk 20%, chhana, sugar (30.0% of total wt.). Experimental Herbal Sandesh R₀M₀, R₀M₁, R₀M₂, R₀M₃, R₁M₀, R₁M₁, R₁M₂, R₁M₃, R₂M₀, R₂M₁, R₂M₂, R₂M₃, R₃M₀, R₃M₁, R₃M₂ and R₃M₃ was prepared from standard cow milk (fat, 3.5% and SNF, 8.5%), chhana, sugar ((30.0% of total wt.) and different ratio of Herbs (Moringa and Roselle) such as 1, 2 and 3%. The control and the experimental product were tested for organoleptic properties by using 9 point hedonic scale. Effect of different level and herbs ratio and sensory scores for all attributes were highly acceptable for Sandesh R₂M₂ made with 96% cow and soy milk Chhana, 2.0% Roselle 2.0% Moringa extract at 0, 3, 5 and 7 days. Increased levels of herbs in Herbal Sandesh R₃M₃ made with 94% cow and soy milk Chhana, 3% Roselle and 3% Moringa 3% herbs in Sandesh, resulted in decrease in Flavour, Texture and overall acceptability.

Keywords: Soy milk, cow milk, chhana, roselle, moringa, sandesh, hedonic scale

Introduction

Sandesh is a very popular and chhana based sweet of eastern India. There is a custom prevailing in West Bengal that whenever good message (Sandesh) is sent to relatives and friends, at least one sweet of exquisite quantity should accompany the messenger. Sandesh is the common sweet carried by the visitors at such occasions. The sweet besides being palatable is also a rich source of milk proteins, fat and fat soluble vitamins like A, D, E, and K. Traditionally Sandesh is prepared by Halwais on a small scale. Three kinds of Sandesh available in market, Karapak, Narampak and Kacchagola. Narampak is the most popular variety.

The national commission on Agriculture (1976)

Cow milk chhana is usually preferred for sandesh making because of its soft body, smooth texture and small grains. Chhana is an indigenous milk product obtained by acid coagulation of hot milk followed by drainage of major quantity of water as whey. The acid commonly used are lactic or citric acid both in natural or chemical form. Chhana used as base material for the preparation of variety of sweetmeats like sandesh, rosogolla, cham cham, rasmalai, pantooa, chhanapodo etc. Traditional method of sandesh making involves preparation of chhana, mixed with sugar (30-35% of chhana), kneaded and cooked at 70-75 °C for 10-15 minutes. The cooked mass is transferred to moulds for desirable shape.

Sandesh product is considered a delicacy and commands a much higher price. This is normal quality sandesh and has a longer shelf-life than the second type which is softer and is more expensive. It is made from fresh chhana. Chemical composition of Sandesh from buffalo milk, Moisture-27.14%, Fat-18.42%, Protein-18.71%, Sugar-33.83%, Ash-1.90%. This is normal quality sandesh and has a longer shelf-life than the second type which is softer and is more expensive (Parekh, 1994) [10]

The soybean (*Glycine max*), legume family could be a native crop of eastern Asia (Amanze 2011) [3]. Soybean is said to have originated in China about 5,000 years ago, with a Chinese emperor being the first to exploit the plant (Al-Bakkush and Al-Amari, 2008) [2]. Its cultivation spread throughout the globe and the share of India is fourth to the planet soybean production.

Because the world population expands, there'll be a greater pressure for the consumption of plant products (Kinsella, 1979) [9].

Soy milk is made by soaking soybeans, grinding them with water. The fluid which results after straining is called soy milk. You can make soy milk at home with basic kitchen tools or with a soy milk machine. Soy milk is most commonly found in aseptic cartons. Most of the soy milk available in the market is flavoured and fortified with extra calcium or vitamins. Soymilk is an excellent source of high quality protein and B-vitamins. Soymilk is not a rich source of calcium, this is way most commercial soymilk products are fortified with calcium. Soy protein is highly digestible (92 to 100%) and contains all essential amino acids. Soy protein products contain high concentration (up to 1 g/kg) of isoflavones that exerts protective properties against breast, prostate, colon and lung cancers (Gupta, 2010) [7].

Moringa oleifera is valued for its multiple economic, medicinal and nutraceutical properties worldwide. This plant has been honoured as Botanical of the Year-2007 by the National Institute of Health (NIH). The Africans accustomed call it Never Die! or Miracle Tree! for its ability to treat over 300 diseases (Swathi *et al.*, 2018) [11].

All parts of the Moringa tree (leaves, seeds, roots and flowers) are suitable for human and animal consumption. Moringa is helpful for human still as animal consumption also. Moringa is employed for the treatment of home scale medicine (Leone *et al.*, 2015).

Roselle (*Hibiscus sabdariffa* L.) seed could be a valuable food resource because of it's rich in protein content and micronutrients. it's also a superb source of fibre (Omabuwajo *et al.* 2000).

Roselle is one in all the foremost important and popular medicinal plants. Roselle is an Indian and Malaysian native flower, where it is widely farmed, and it must be sent to Africa as soon as possible. The seeds are said to be utilised for oil in various regions of Africa. Protein, dietary fibre, carbs, and lipids are all said to be abundant in the seeds (Abu-Tarboush *et al.*, 1997) [1].

Material and Method

The present study has been carried out in the research Lab,

Warner College of Dairy Technology, SHUATS, Prayagraj, U.P. (India). All the raw materials were collected from the local market of Allahabad. Potable water was used for preparing the product. It was ensured that the materials used were free from any kind of infection.

Herbs: Roselle and Moringa dried leaves were purchased from Prayagraj.

Preparation of herbal water extract

Herbal water extract was prepared by soaking each herb in distilled water (1:10) overnight followed by centrifugation (2000 rpm; 15 min at 40 °C). The supernatant was harvested and refrigerated and used in the preparation of Herbal Sandesh.

Preparation of chhana

The method adopted to prepare chhana in this study was according to the method given by Bhattacharya *et al.*, (1971) [5] with slight modification. The standardized buffalo milk was heated up to 75 °C. The freshly prepared coagulant solution was heated to 75 °C and then added slowly in a thin continuous stream with continuous gentle agitation till a clear whey separated out. Stirring was then stopped and the curd was allowed to remain in whey for about 5 minutes. It was then drained through a hang with muslin cloth (10 min) and stored for future use.

Preparation of herbal Sandesh

Fresh chhana and herbs (table 1) was kneaded thoroughly to make a uniform dough. Fine powdered cane sugar (300 g) was added to the dough' and was kneaded again. The dough was then heated (75 °C) in an iron pan with continuous stirring. Heating was continued until the mixture acquired desired consistency with slightly cooked flavored. During the final stages of heating, the mixture developed slight cooked flavor and the sticking tendency to the pan disappeared. The cooking was completed in 15-20 min. The products were then transferred to a shallow pan, cooled and sliced into desired shapes. Thus, final product obtained and packed in plastic box for storage at room temperature (25+ 5 °C).

Table 1: Ingredients Used in the Preparation of Herbal Sandesh for 1 Kg

Sr. No.	Treatment	Cow Milk	Soy Milk	Chhana (80:20) in (gm)	Rosella Leaves Extract (gm)	Moringa Leaves Extract (gm)	Total (gm)
1	R ₀ M ₀	100		1000	00	00	1000
2	R ₀ M ₁	99		990	00	01	1000
3	R ₀ M ₂	98		980	00	02	1000
4	R ₀ M ₃	97		970	00	03	1000
5	R ₁ M ₀	99		990	01	00	1000
6	R ₁ M ₁	98		980	01	01	1000
7	R ₁ M ₂	97		970	01	02	1000
8	R ₁ M ₃	96		960	01	03	1000
9	R ₂ M ₀	98		980	02	00	1000
10	R ₂ M ₁	97		970	02	01	1000
11	R ₂ M ₂	96		960	02	02	1000
12	R ₂ M ₃	95		950	02	03	1000
13	R ₃ M ₀	97		970	03	00	1000
14	R ₃ M ₁	96		960	03	01	1000
15	R ₃ M ₂	95		950	03	02	1000
16	R ₃ M ₃	94		940	03	03	1000

Note: Sugar use for all Treatment: 300 gm (30.0% of total wt.)

Sensory evaluation of Herbal Sandesh

The samples of Herbal Sandesh were evaluated for colour and Appearance, Flavour and Taste, Body and texture, and

Overall Acceptability and Total Score of Herbal Sandesh samples on a 9-point Hedonic scale by a sensory panel consisting of 5 judges for 5 replication (BIS, 1981) [6]

Results and Discussion

The studies were conducted on the assessment of sensory

quality of the Herbal Sandesh. The findings are tabulated in Table-2.

Table 2: Sensory evaluation Attributes of herbal sandesh (Mean Value in percentage)

Treatment Days	Colour and appearance				Body and texture				Flavour and taste				Overall Acceptability			
	0	3	5	7	0	3	5	7	0	3	5	7	0	3	5	7
zR ₀ M ₀	7.26	6.9	5.98	4.22	7.41	7.15	6.07	4.38	7.24	6.96	5.76	2.184	7.312	7.07	5.93	3.592
zR ₀ M ₁	7.42	7.1	6.76	6.04	7.71	7.62	7.30	6.75	8.27	7.91	7.58	6.118	7.876	7.56	7.21	6.302
zR ₀ M ₂	7.45	7.21	6.81	6	7.91	7.72	7.47	7.24	8.57	8.16	7.82	6.684	8.082	7.70	7.36	6.642
zR ₀ M ₃	7.36	7.08	6.89	6.18	7.95	7.76	7.75	7.35	8.60	8.19	7.94	7.19	8.092	7.71	7.52	6.902
zR ₁ M ₀	7.58	7.4	6.59	6.11	7.90	7.48	7.17	6.81	7.70	7.20	6.76	5.922	7.756	7.41	6.804	6.282
zR ₁ M ₁	7.76	7.41	7.08	6.2	7.81	7.57	7.25	7.11	8.21	7.90	7.27	6.906	7.960	7.60	7.284	7.114
zR ₁ M ₂	7.57	7.37	7.09	6.3	7.92	7.76	7.47	7.18	8.70	8.19	7.71	7.166	8.162	7.65	7.422	6.888
zR ₁ M ₃	7.73	7.5	7.19	6.26	7.93	7.78	7.51	7.26	8.33	7.91	7.30	6.832	8.050	7.75	7.452	6.782
zR ₂ M ₀	7.74	7.44	6.96	6.46	7.06	7.84	7.62	7.31	7.72	7.48	7.11	6.568	7.460	7.70	7.202	6.772
zR ₂ M ₁	8.45	7.98	7.42	6.1	8.02	7.89	7.50	7.25	8.16	7.75	7.19	6.784	8.214	7.87	7.372	6.708
zR ₂ M ₂	8.33	8.06	7.68	6.36	8.28	8.08	7.76	7.45	8.71	8.29	7.77	7.222	8.462	8.11	7.732	7.012
zR ₂ M ₃	8.22	7.88	7.52	6.52	7.29	7.24	7.07	6.71	8.50	8.11	7.45	7.026	7.924	7.55	7.344	6.752
zR ₃ M ₀	8.43	7.83	7.32	6.69	8.08	8.21	7.51	7.38	7.76	7.38	7.15	6.7	8.022	7.96	7.322	6.922
zR ₃ M ₁	8.41	8.08	7.5	6.4	8.29	8.09	7.80	7.44	7.48	7.17	6.88	6.602	7.99	7.91	7.392	6.816
zR ₃ M ₂	8.43	8	7.62	6.57	7.49	7.41	7.12	6.77	8.01	7.80	7.26	6.942	7.886	7.60	7.332	6.762
zR ₃ M ₃	8.19	7.27	7.03	6.58	7.36	7.08	7.02	6.81	8.03	7.81	7.31	6.988	7.794	7.26	7.122	6.792

Note: Average score evaluated by five judges

3. Sensory evaluation of Herbal Sandesh

3.1 Colour and appearance score of Herbal Sandesh at 0 day

The highest mean in colour and appearance score at zero day of Herbal Sandesh was obtained in treatment R₂M₁ (8.45) while R₀M₀ recorded the minimum (7.26).

3.2 Colour and appearance score of Herbal Sandesh at 3 days

The highest mean in colour and appearance score at three days of Herbal Sandesh was obtained in treatment R₃M₁ (8.08) while R₀M₀ recorded the minimum (6.9).

3.3 Colour and appearance score of Herbal Sandesh at 5 days

The highest mean in colour and appearance score at five days of Herbal Sandesh was obtained in treatment R₂M₂ (7.68) while R₀M₀ recorded the minimum (5.98).

3.4 Colour and appearance score of Herbal Sandesh at 7 days

The highest mean in colour and appearance score at seven days of Herbal Sandesh was obtained in treatment R₃M₀ (6.69) while R₀M₀ recorded the minimum (4.22).

3.5 Body and texture score of Herbal Sandesh at 0 day

The highest mean in body and texture score at zero day of Herbal Sandesh was obtained in treatment R₃M₁ (8.29) while R₂M₀ recorded the minimum (7.06).

3.6 Body and texture score of Herbal Sandesh at 3 days

The highest mean in body and texture score at three days of Herbal Sandesh was obtained in treatment R₃M₀ (8.20) while R₃M₃ recorded the minimum (7.08).

3.7 Body and texture score of Herbal Sandesh at 5 days

The highest mean in body and texture score at five days of Herbal Sandesh was obtained in treatment R₃M₁ (7.80) while R₀M₀ recorded the minimum (6.07).

3.8 Body and texture score of Herbal Sandesh at 7 days

The highest mean in body and texture score at seven days of

Herbal Sandesh was obtained in treatment R₂M₂ (7.45) while R₀M₀ recorded the minimum (4.38).

3.9 Flavour and taste score of Herbal Sandesh at 0 days

The highest mean in flavour and taste score at zero day of Herbal Sandesh was obtained in treatment R₂M₂ (8.71) while R₀M₀ recorded the minimum (7.24).

3.10 Flavour and taste score of Herbal Sandesh at 3 days

The highest mean in flavour and taste score at three days of Herbal Sandesh was obtained in treatment R₂M₂ (8.29) while R₀M₀ recorded the minimum (6.96).

3.11 Flavour and taste score of Herbal Sandesh at 5 days

The highest mean in flavour and taste score at five days of Herbal Sandesh was obtained in treatment R₀M₃ (7.94) while R₀M₀ recorded the minimum (5.76).

3.12 Flavour and taste score of Herbal Sandesh at 7 days

The highest mean in flavour and taste score at seven days of Herbal Sandesh was obtained in treatment R₁M₁ (8.10) while R₀M₀ recorded the minimum (2.18).

3.13 Overall acceptability score of Herbal Sandesh at 0 day

The highest mean in overall acceptability score at zero day of Herbal Sandesh was obtained in treatment R₂M₂ (8.462) while R₀M₀ recorded the minimum (7.312).

3.14 Overall acceptability score of Herbal Sandesh at 3 days

The highest mean in overall acceptability score at three days of Herbal Sandesh was obtained in treatment R₂M₂ (8.11) while R₀M₀ recorded the minimum (7.07).

3.15 Overall acceptability score of Herbal Sandesh at 5 days

The highest mean in overall acceptability score at five days of Herbal Sandesh was obtained in treatment R₂M₂ (7.73) while R₀M₀ recorded the minimum (5.93).

3.16 Overall acceptability score of Herbal Sandesh at 7 days

The highest mean in overall acceptability score at seven days of Herbal Sandesh was obtained in treatment R₂M₂ (7.11) while R₀M₀ recorded the minimum (364.51).

Conclusion

The above research work provided a better understanding of desired Sensory evaluation imparted by the herbs on Herbal Sandesh. The Herbal Sandesh prepared by blended cow milk and soy milk incorporated with Moringa and Roselle extract. From the findings of this study undertaken, it is concluded that the Herbal Sandesh containing 2% Roselle and 2% Moringa (R₂M₂), 3% Roselle (R₃M₀) and 3% Moringa (R₀M₃) was better as compare to with other treatments in organoleptic characteristics. R₂M₂, R₂M₁ and R₃M₀ showed significant differences in organoleptic characteristics (Colour & Appearance, Body & Texture, Flavour & Taste and Overall Acceptability) at regular interval 0, 3, 5 and 7 days.

References

1. Abu-Tarboush HM, Ahmed SAB, Al- Kahtani HA. Some nutritional properties of karkade (*Hibiscus sabdariffa*) seed products. Cereal Chem. 1997;74:352-355.
2. Al-Bakkush, Al-Amari A. Improvement of functional properties of soy protein. Ph.D. Thesis submitted to School of Life Sciences, Heriot-Watt University, Edinburgh, 2008.
3. Amanze KO, Amanze JO. Quality evaluation of yoghurt from cow milk/soy milk. J Research in National Development. 2011;9(2):44-47.
4. Anonymous. Enhancement of dairy products. National Commission of Agriculture, Report, 1976, 43-48.
5. Bhattacharya DC, Mathur PM, Srinivasan MR, Samlik O. Studies on the method of production and self life of paneer. J of Food Sci. Technol. 1971;7:117-119.
6. BIS IS. 18 Handbook of food analysis Part XI. Dairy products. Bureau of Indian Standards, Manak Bhavan, New Delhi, 1981.
7. Gupta V, Vijayalakshmi NS, Ashwin B, Anbarasu K, Vijayalakshmi G, Prakash M. Shelf life enhancement of coconut burfi: An Indian traditional sweet. J Food Qual. 2010;33:329-349.
8. Husain SA, David J. Studies on sensory attributes of Herbal Sandesh by incorporation of Ashwagandha (*Withania somnifera*) and Tulsi (*Ocimum sanctum*) at room temperature. Journal of Pharmacognosy and Phytochemistry. 2018;7(3):2567-2571.
9. Kinsella JE. Functional properties of soy proteins. American J Oil Chemists Society. 1979;56:242-258.
10. Parekh JV. Emerging role of consultancy services for augmenting dairy industry in India. Proc National Symp Meat and Milk industry: Trends and Developmental Strategies, 1994, 184-194.
11. Swati G, Rohit J, Sumita K, Kothar SL. Nutritional and medicinal applications of *Moringa oleifera* Lam. Review of current status and future possibilities. Journal of Herbal Medicine. 2018;11:1-11.