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Studies on preparation of rosogolla from a blend of cow milk & soymilk

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Abstract
Rosogolla prepared from the blend of cow milk and soymilk is a rich source of high quality protein, fat, carbohydrate, vitamins, minerals and ash. This approach gave relatively cheaper product in the domestic market. Soya has high quality protein with minimum saturated fat. The finished product provides protection against Cancer, Anemia, Asthma, etc. and help people to take highly nutritious diet in their budget. Objective of this dissertation was to focus on blending ratio of cow milk & soymilk (100:00), (70:30), (60:40) and (50:50) for respective treatments T_0, T_1, T_2 & T_3 to assess chemical quality, organoleptic quality & estimation of the cost of production of rosogolla. The treatment ware evaluated for various physico-chemical and sensory parameters. The organoleptic characteristics were evaluated by using 9 point hedonic scale. The highest mean score for overall acceptability percentage of rosogolla (8.20) was obtained for T_1. The fat %, protein %, carbohydrate %, moisture % and ash % of T_1 was found to be 5.92 %, 6.12 %, 41.34 %, 44.59 & and 2.02 % respectively. The highest cost (Rs./Kg) of rosogolla (147.34) was obtained for T_0 followed by T_1(129.55), T_2 (124.24) and T_3 (118.74) respectively.

Keywords: Cowmilk, soymilk, suger, citricacid, calciumsulphate, wheatfloor, backingpowder

Introduction
Rasogolla is the most important pleasant and charming foods to most of the people of the country. In Eid, Puja, birthday, marriage ceremony and in any party or any kind of entertainment either in domestic or national level, rasogolla area sued as one of the famed and demandable items. It is very nutritious for accounts of its fairly high protein, fat, minerals specially calcium and phosphorus and also fat- soluble vitamins particularity vitamin A and D. Despite and Datto (1993) [13] defined rasogolla as the most popular Indian sweet meats that are valued for its characteristics texture. It is also a common milk product in India. Rosogolla prepared from the blend of cow milk and soymilk is a rich source of high quality proteins, fat, carbohydrate, vitamins, minerals, ash. This approach gave relatively cheaper product in the domestic market. Soya has high quality protein with minimum saturated fat. The finished product provides protection against Cancer, Anemia, and Asthma etc. and help people to take highly nutritious diet in their budget. India surpassed the United States as the world's largest milk producing country. Annual growth rate in per capita production of milk [1994 – 2004] in India was > 2.5 %. But annual per capita milk consumption for developing countries like India had been reported as 31 kg / capita/ year only as compared to that of 93 kg in developing countries. This can be attributed to a sustained expansion in domestic demand, increase in the cost of milk and export of milk to developed countries. Health professional consider soy protein as superior protein. The amino acid pattern of soy protein is virtually equivalent in quality to that of milk and egg protein. The 1990's FAO/ WHO protein evaluation committee puts soy protein at par with egg and milk protein and ahead of beef protein. Unlike many other good sources of protein, soybean not only has higher percentage of oil but also quality fatty acids profile.

Materials & Methods
Treatments studies for prepration of rosogolla from a blend of cow milk &soya milk was conducted in research laboratory Warner College of food &dairy technology shuats. sam higginbottom institute of agriculture technology and sciences.allahabad-211007

Collection of Ingridients
Cowmilk was parched from local market of Allahabad.
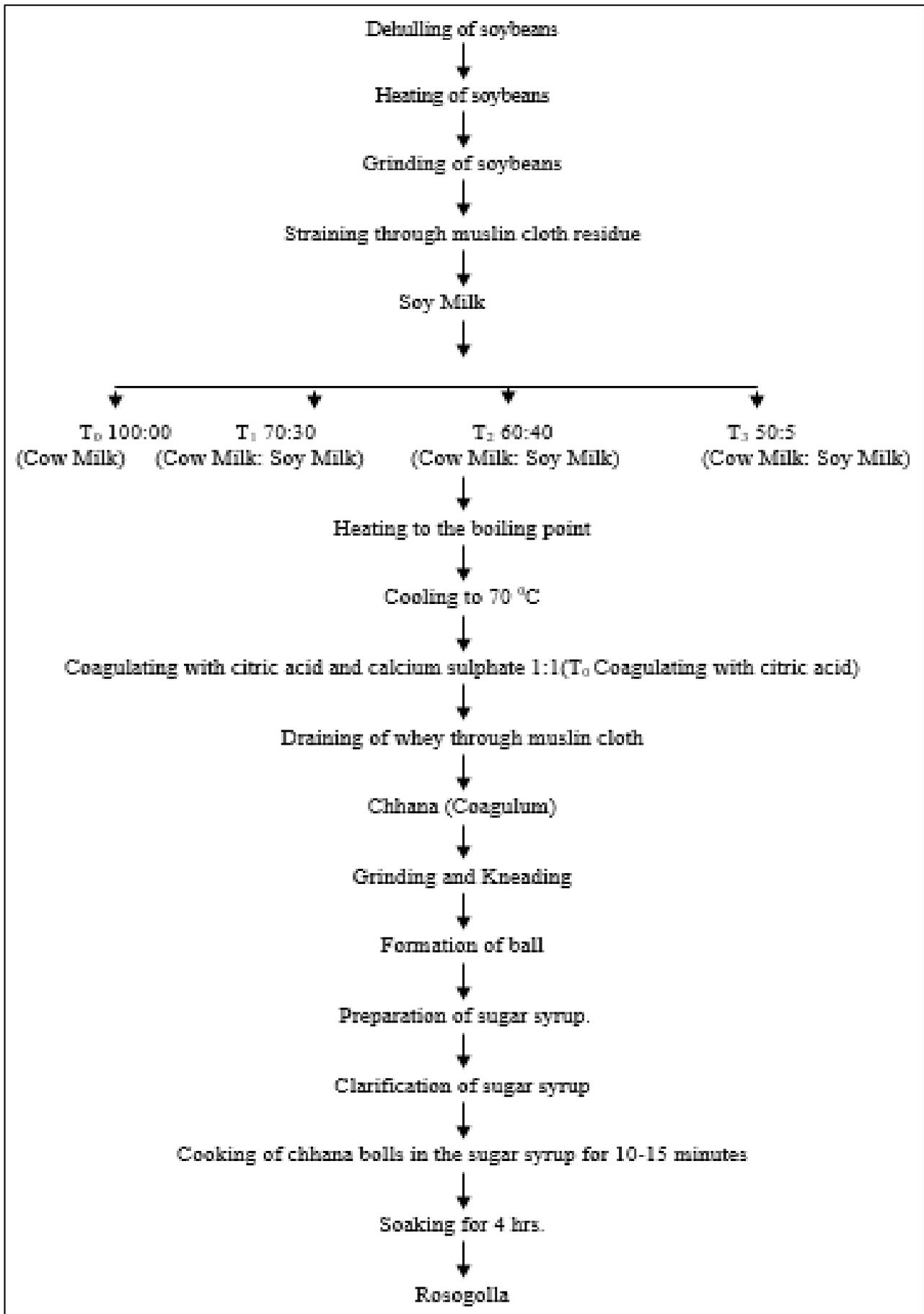Soyaseed was parched from local market of Allahabad.

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Sugar was parched from local market of Allahabad. Wheatflour & backingpowder was parched from local market of Allahabad.

Citricacid & calciumsulphate was collected form the laboratory of the department of dairy technology.

Process flow diagram: Sock the soya seed for 8-9 hours for complete socking after that follow the structured diagram-

Dehulling of soybeans

↓

Heating of soybeans

↓

Grinding of soybeans

↓

Straining through muslin cloth residue

↓

Soy Milk

↓

T_0 100:00 (Cow Milk)	T_1 70:30 (Cow Milk: Soy Milk)	T_2 60:40 (Cow Milk: Soy Milk)	T_3 50:5 (Cow Milk: Soy Milk)

↓

Heating to the boiling point

↓

Cooling to 70 °C

↓

Coagulating with citric acid and calcium sulphate 1:1(T_0 Coagulating with citric acid)

↓

Draining of whey through muslin cloth

↓

Chhana (Coagulum)

↓

Grinding and Kneading

↓

Formation of ball

↓

Preparation of sugar syrup.

↓

Clarification of sugar syrup

↓

Cooking of chhana bolls in the sugar syrup for 10-15 minutes

↓

Soaking for 4 hrs.

↓

Rosogolla

Treatments combination & ratios

In this experimental dissertation work preparation of rosogolla from a blend of cowmilk & soymilk has different treatment combinations explained as T_0 prepared from only cow milk (100:00), T_1 blending ratio of cow milk &soya milk was (70:30), T_2 blending ratio of cow milk &soymilk was (60:40) T_3 blending ratio of cowmilk &soy milk was (50:50) respectively.

Plan of work

Data were analyzed staitically by analysis of variance at 5%leval of significance. where no of treatments &reapplications were frequent 4,5.Total no of trails conducted for rosogolla preparation were 20. Tequinical programs which involves chemical characteristics (moisture, fat, protein, carbohydrate & ash) along with organoleptic score parameters at 9point hedonic scale.

Result & Discussion

The present study was based to evolve "Studies on preparation of rosogolla from a blend of cow milk and soy milk". The data collected on different aspects were tabulated & analyzed statistically using the methods of analysis of variance & critical difference. The significant & non-significant differences observed have been analyzed critically within & between the treatment combinations.

Table 1: Data parameters of control and experimental Rosogolla & cost.

Parameters	Treatments					
	T_0	T_1	T_2	T_3	S.Ed value ($\pm$)	CD Value
1. Chemical analysis (in percent)						
Moisture	46.24	44.59	43.11	42.11	0.17	0.37
Fat	6.91	5.92	5.77	5.38	0.03	0.06
Protein	5.88	6.12	6.48	6.82	0.04	0.09
Total Carbohydrate	39.34	41.34	42.18	43.03	0.18	0.40
Ash	1.63	2.02	2.45	2.66	0.04	0.10
2. Organoleptic scores (9 point hedonic scale)						
Flavour & taste	7.96	8.36	7.36	7.18	0.16	0.36
Body & texture	8.24	8.28	7.80	7.72	0.13	0.28
Colour & Appearance	7.96	8.16	7.68	7.44	0.10	0.22
Overall Acceptability	8.12	8.20	7.64	7.76	0.09	0.20
3. Cost of production (Rs/ kg)						
Cost (Rs/ kg)	147.34	129.55	124.24	118.74		

Chemical Charecterstics for Rosogolla

Moisture

In all above treatments & reapplication the highest mean score for moisture (%) of Rosogolla (46.24) obtained by control followed by T_1(44.59), T_2(43.11) & minimum score (42.11) obtained by T_3.the difference in score for moisture of rosogolla was significant.

Fat

In all above treatments &reapplication the highest mean score for fat (%) of Rosogolla (6.91) obtained by control followed by T_1(5.92), T_2(5.77) &minimum score(5.38)obtained by T_3.the difference in score for fat of rosogolla was significant.

Protein

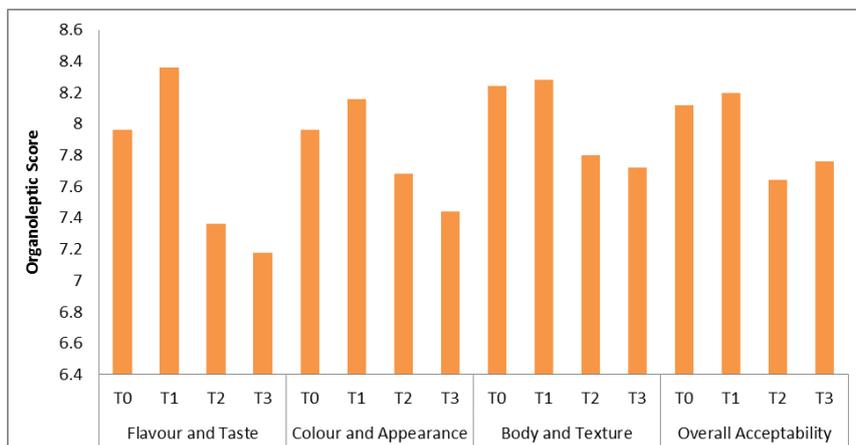In all above treatments &reapplication the highest mean score for protein (%) of Rosogolla (6.82) obtained by T_3 followed by T_2(6.48), T_1(6.12) &minimum score(5.88)obtained by control. the difference in score for protein of rosogolla was significant.

Ash

In all above treatments & reapplication the highest mean score for Ash (%) of Rosogolla (2.66) obtained by T_3 followed by T_2(2.45), T_1(2.02) & minimum score (1.63) obtained by control. the difference in score for Ash of rosogolla was significant.

Total carbohydrate

In all above treatments &reapplication the highest mean score for carbohydrate (%) of Rosogolla (43.03) obtained by T_3 followed by T_2(42.18), T_1(41.34) &minimum score (39.34) obtained by control. the difference in score for carbohydrate of rosogolla was significant.

Graph 1: The organoleptic scores of rosogolla of different treatments.

Organoleptic Charecterstics
Coloure & appearence
In all above treatments &reapplication the highest mean score for coloure & appearance (%) of Rosogolla (8.16) obtained by T_1 where control was (7.96) fallowed by T_2(7.68) & T_3(7.18). the difference in score for coloure & appearence of rosogolla was significant.

Body &texture
In all above treatments &reapplication the highest mean score for body & texture (%) of Rosogolla (8.28) obtained by T_1 where control was (8.24) fallowed by T_2(7.80) & T_3(7.72). the difference in score for body & texture of rosogolla was significant.
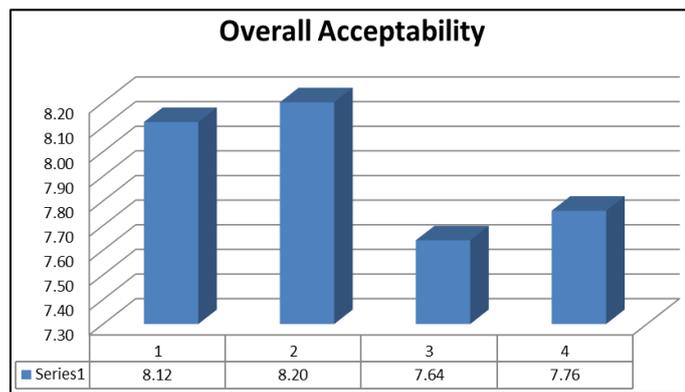
Flavoure & taste
In all above treatments &reapplication the highest mean score for flavoure & tast (%) of Rosogolla (8.36) obtained by T_1 where control was (7.96) fallowed by T_2(7.36) & T_3(7.16). the difference in score for flavoure & taste was significant

Overall acceptability
In all above treatments &reapplication the highest mean score for overall acceptability (%) of Rosogolla (8.20) obtained by T_1 where control was (8.12) fallowed by T_3(7.76) & T_2(7.64). the difference in score for overall acceptability was significant.

Table 2: Critical difference in Overall acceptability scores for control and experimental rosogolla of different treatments.

Treatments	Average	T_0 8.12	T_1 8.20	T_2 7.64	T_3 7.76
T_0	8.12		0.08	0.48	0.36
T_1	8.20			0.56	0.44
T_2	7.64				0.12
T_3	7.76				
CD	0.20				

Graph 2: Overall acceptibuilty score for control & experimental rosogolla.

Cost analysis In all above treatments &reapplication the highest mean score for cost (%) of Rosogolla (147.34) obtained by control followed by T_1(129.55), T_2(124.24) &minimum score (118.74) obtained by T_3 respectively.

Conclusion
The results obtained from the present investigation revealed that value addition of Rosogolla can be done by blending cow milk and soya milk in different ratios satisfactorily. Though significance difference was found in most of parameters with respect to the different treatments, T_1 (70% cow milk and 30% soymilk) was found to be the best in terms of chemical sensory parameters.

References
1. Webb BH, Johnson AH. Fundamentals of Dairy Chemistry, The A.V.I. Publishing Co. New York, 1965.
2. Ravichandra MN, Mishra HN, Das H. Optimization of process parameters for the production of rasogolla from cow milk. J Food Sci. and Tech., (Mysore). 1997; 34:46-49.
3. Shukla GS, Bargava VN. Production of rassogolla in relation to moisture in chhana containing different levels of fat, M.Sc. Thesis submitted in BHU, Varanasi, 1981.
4. Ravichandra MN, Mishra HN, Das H. Optimization of process parameters for the production of rasogolla from cow milk. J Food Sci. and Tech., (Mysore). Nande, 1997; 34:46-49.
5. Srinivasan MR, Anantakrishnan CP. Milk products of India, I.C.A.R. New Delhi, 1964.
6. Suguna Rao M, Rao M, Ranganadham M, Rao BVR. Studies on preparation of chhana from buffalo milk and its suitability for rasogolla manufacture. Indian J Dairy Sci. 1989; 42:810-816.
7. Chavan RS, Prajapati PS, Jana A, Hingu M, Chavan SR, Khedkar CD. Influence of storage period and temperature on physico-chemical properties and microbial quality of dietetic and diabetic rosogolla. Karnataka J Agric. Sci. 2010; 23(4):628-631.
8. Tapadia PP, Jain K, Lodhaya F, Vali AS. A study of soya milk as a substitute for animal milk. J Dairying, Foods and H. S. 2008; 27(1):1-10.
9. Kundu SS, De SC. Chhana production from buffalo milk in Indian J Dairy Sci. 1972; 25(3):159-163.
10. Kanwal S, Bandyopadhyay AK, Ganguli NC. Manufacture of rasogolla from buffalo milk, Indian J Dairy Sci. 1980; 33:357-365.
11. Ganguli NC. Indian Dairyman. 1968; 20(8):227-230, 261.
12. Dimove N, Minerva P. Effect of some factors on the synthesis of fresh curd and losses of solids in whey in the processing of cow,ewes, and buffalo milk in Dairy Sci. Abst. 1963; 25(5):212.
13. Dispite, Datto. Journals of food science and technology. 1993; 39(5):502-506.