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Development of a high protein low sugar aloe Shrikhand

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Abstract

This study was undertaken to develop low sugar, high protein aloe vera Shrikhand. Shrikhand is a traditional Indian sweet popular in western Indian states of Maharashtra & Gujarat. Sweet is a special component of Indian food. High intake of sweet can lead to various health problems. Thus, people are now more conscious about eating sweets. Diabetic and obese people are restricted to have sweets. Thus, it is the concept of making sweet available to generic population in a healthy form. The developed Aloe Shrikhand is rich in protein. It contains 50% less sugar than the product available in market. It also contains Aloe vera pulp that has added nutritional benefits. It was formulated and analysed for its physical, biochemical and sensory properties. The nutritional properties were determined on the basis of physicochemical characterization such as moisture content (49.8%), ash content (0.76%), total fats 7.72g/100g, Carbohydrates 20g/100g, protein (20g/100g) along with microbial testing. Organoleptic analysis based on the attributes of colour, flavour, texture, taste, and odour showed that the product was liked very much (Hedonic rating 8) by the panelist. A suitable packaging of the product was selected taking into considerations the properties of the product and shelf life study was carried out and observed that the product has shelf life of 15 days from the date of manufacture. Thus, it can be a healthier alternative for the sweet Shrikhand available in the market and can be included in diet.

Keywords: *Aloe-Shrikhand*, high protein, low sugar, Aloe vera pulp

Introduction

India has a very rich variety of fermented foods prepared from milk, cereals, pulses vegetables, fruits and fish. Milk and milk products like curd, buttermilk, lassi and Shrikhand are a traditional indigenous fermented semi soft, sweetened whole milk product prepared using Chakka (Strained dahi). Dairy products are likely to remain important dietary components because of their nutritional value, flavour and texture. There will continue to be a demand for traditional, high quality dairy products, despite increasing competition from non-dairy based products (Rathore *et al.*, 2007) ^[15].

Peoples are health conscious and are looking forward to have products that carry functional and therapeutic values. Aloe vera (*Aloe barbadensis miller*) is such a plant that has as many as 200 different types of molecules of health importance. Due to this, it has been used since ancient time for treating various types of disorders. The Aloe vera contains 1.0-1.5 per cent TS out of which, polysaccharides occupy 55 per cent, sugars 17 per cent, minerals 16 per cent, proteins 7 per cent, lipids 4 per cent and phenolic compounds 1per cent on dry basis. It also contains many vitamins A, C and E. Vitamin B1 (Thiamine), niacin, Vitamin B2 (Riboflavin), vitamins B12 (Cyanocobalamin), choline and folic acid including the important antioxidant. Health benefits of Aloe vera include wound healing, halts the cancer tumours, prevents kidney stones, lowers high cholesterol, reduces high blood pressure, stabilizes blood sugar and ends constipation. These day's researchers are also concentrating to utilize Aloe vera as an ingredient in dairy and food formulations. Aloe vera gel or juice are used to incorporate in different dairy products like flavoured milk, ice cream, Dahi, yoghurt, Lassi and also food products like RTS and edible coatings etc. (Srikanth, Keerthi, Kartikeyan, S., Adarsh, Kalla, Punitha, K. and Sharanabasava (2016) ^[10].

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High-Quality protein source-pea protein contains all nine essential amino acids that your body cannot create and must get from food. It's also a great source of branched-chain amino acids, especially arginine - which promotes healthy blood flow and heart health - and leucine, isoleucine and valine-which promote muscle growth In general, animal proteins are more easily digested and absorbed than plant-based proteins. Still, research demonstrates that pea protein is one of the more easily digested plant-based proteins (Erica Julson, MS, RDN, CLt on November 30, 2018)

It is a semi-soft concentrated composite milk product obtained from *Chakka*, or skimmed milk *Chakka* to which milk fat and sugar are added or by any other process which leads to a product of same composition and characteristics. It may also contain permitted non-dairy ingredients. Shrikhand is a traditional Indian sweet popular in western Indian states of Maharashtra & Gujarat. It is an innovative step in the formulation of traditional sweet Shrikhand. It claims high protein, low sugar content and goodness of *Aloe vera* pulp. It is designed to formulate a sweet dish that can provide health benefit without compromising with taste. It is a concept to make sweet healthy and nutritious. (Singh, Manvendra, Gupta, Ramji, Andhare BC and Singh, Shweta (2015). Effect of fat and sugar on sensory quality of Shrikhand. Res. J Animal Hus. & Dairy Sci. 6(1):52-56.)^[16].

Materials and Methods

The raw materials used in formulating *Aloe- Shrikhand* were Chakka (Milk Solid), Sugar, Maltitol, Aloe vera Pulp, Protein powder (pea protein), Cardamom powder.

Nutrient Analysis of the product

The Determination of Protein, Carbohydrate and Fat were determined by the procedures described in AOAC manual.

Preparation of *Aloe Shrikhand*

1. Formation of Curd - Standardised cow milk was used and preheated at 40°C. Then culture was inoculated (Dahi 0.5%), followed by incubation for 5-6 hours for formation of curd.
2. Making of Chakka - The prepared curd was hanged in muslin cloth to separate whey, and chakka is obtained (milk solid).
3. Blending of all raw materials to prepare shrikhand - Addition of all other ingredients (Sugar +Maltitol+Aloe vera pulp + Protein powder + Elaichi powder) was done to chakka and blended to form shrikhand.
4. Packaging packing of product was done in airtight containers and sealed.
5. Storage the product was stored immediately at 0°C.

Physico-chemical properties: The titratable acidity of product was determined by the procedure outlined by BIS

(1981)^[17]. The pH of the ice cream samples were analysed by digital pH meter. The percentages of carbohydrate, protein, fat, ash and moisture were determined by the procedure outlined by AOAC (2000). The product was checked for its Shelf life for 15 days under Room Temperature and also at Refrigerated conditions and it was observed that the product was at its optimum quality until 15 days in refrigerated condition and until 2 days at room temperature. The total coliform count was taken using pour plate method. Serial dilutions were made then transferred into petri plates EMB agar approx. 20 ml was added to the plates. The plates were Incubated at 37°C and observed the growth.

Sensory analysis: It was done using hedonic scale method and was observed that most of the panelists rated the product - 8- for its overall acceptability and hence it can be interpreted that the product was liked very much by the panelists and very well accepted.

Results and Discussion

The prepared *Aloe Shrikhand* was observed for physico chemical, Microbial and Sensory analysis. The values of proximate analysis of the product including fat, protein, carbohydrates, ash and moisture are displayed in below Table no.1. From the results it is evident that the product is rich in protein and contains moderate amount of carbohydrates. It contains 50% less sugar as compared to Shrikhand available in market. The protein content was estimated by biuret method and was found to be 20g/100g. The carbohydrate content was estimated by an throne method and was found to be 20g/100g.

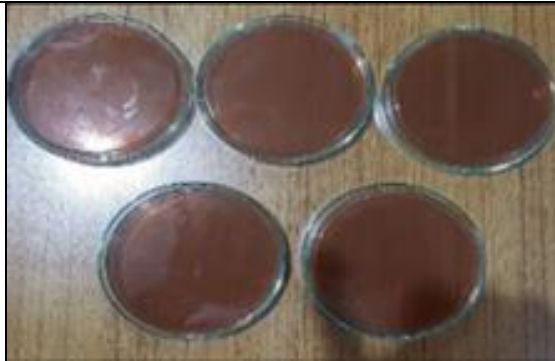



The Liquid-Liquid extraction method was used for fat content estimation and the amount of fat in the product was 7%. The Ash and Moisture content of the formulated product was 0.76% and 49.8%, respectively.

Energy content of the product was 234 kcal/100g. The total acidity of the product was found to be 1.4 which was under the range prescribed by Fssai for Shrikhand. There was no growth of Coliform colonies till day 7 in all the dilutions except for 10⁻⁵ also there were few colonies seen on the day 10 in dilutions 10⁻⁴ and 10⁻⁵ it can be seen below in Table no.02 of colonies were under limits. Thus, it can be concluded that the product is safe from microbial contamination and can show a Shelf life approx. 10 days. The result of sensory analysis presented in a graphical format in below in Fig no.01. The image of the product after final formulation of *Aloe Shrikhand* is figure no.2 and following the image of product after packaging and labelling fig no.3 and fig no.4 respectively.

Table 1: Physico-chemical properties

Parameters	Moisture	Ash	Fat	Protein	Carbohydrate	Energy
Values/100g	49.85%	0.76%	7.72%	20g	20g	234Kcal

Table 2: Microbial analysis

DAY 1	
DAY 3	
DAY 5	
DAY 7	

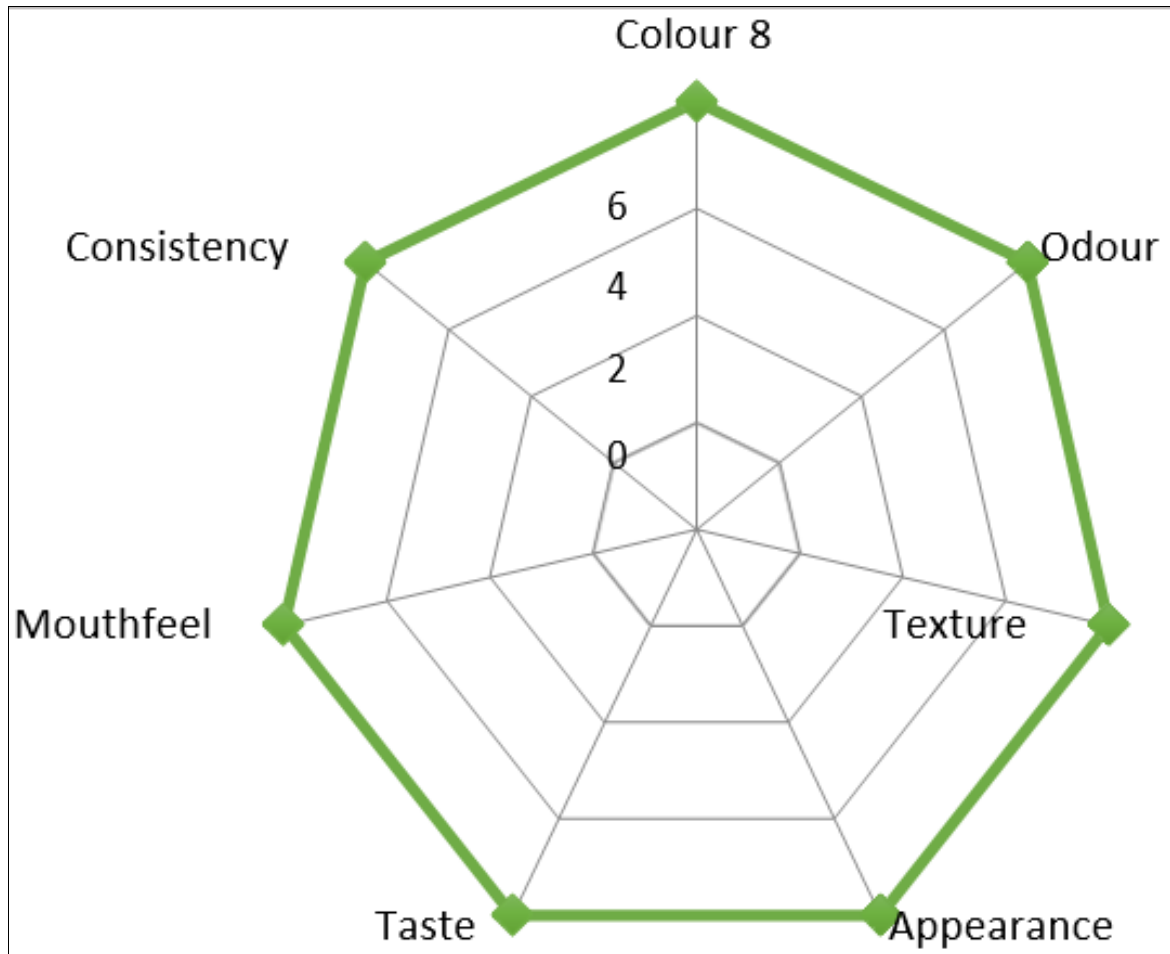


Fig 1: Sensory analysis



Fig 2: Final product



Fig 3 Product Packaging and Labelling



Fig 4: Protein rich product with low sugar content and goodness of Aloe

Conclusion

This study was undertaken to develop protein rich product with low sugar content and goodness of Aloe vera.

All the values were found to be within limits specified by the FSSAI regulations for product under the category of fermented dairy products.

Microbial analysis of the product was carried out and was found to be in limit as per regulatory requirements.

Addition of preservatives can help in increasing the shelf life of product.

A feedback obtained by sensory analysis showed that the product was liked very much (hedonic scale -8) based on the attributes of colour, taste, mouth feel and odour.

It can be accepted by generic population as a source of sweet replacement with additional health benefits without change in taste. Good alternative of sweet for diabetic, obese and health conscious population.

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References

1. Food safety and standards act, No. 34 OF 2006, Ministry of Law and Justices (Legislative Department), New Delhi, the 24th August 2006/Bhadra 2, 1928 (saka); c2006.
2. FSSAI Documents:- <http://www.fssai.gov.in/home/food-testing/food-tsting-manual.html>
Manual on milk and milk Products; c2016.
Manual on Food additives; c2016.
Manual on Microbiological food testing; c2012.
Food Safety and Standards (Advertising and Claims) Regulations; c2018.
3. Srinivas J, Suneetha JW, Maheswari UK, Kumari AB, Devi SS, Krishnaiah N. Nutritional analysis of value added Shrikhand. *J Pharmacogn Phytochem.* 2017;6(5):1438-1441.
4. Singh M, Gupta R, Andhare BC, Singh S. Effect of fat and sugar on sensory quality of Shrikhand. *Res J Anim Hus Dairy Sci.* 2015;6(1):52-56.
5. Srikanth K, Kartikeyan S, Adarsh, Kalla, Punitha K, Sharanabasava. [No further details available].
6. Swapna G, Chavannavar SV. Shrikhand-value added traditional dairy product. *Int J Food Nutr Sci.* 2013;2. [No Further Details Available].
7. Mehta M. Proximate analysis of branded Shrikhand. *J Food Dairy Technol.* 2013; [No Further Details Available].
8. Pal M, Devrani M. Shrikhand: A delicious fermented dairy product of India. 2014; [No Further Details Available].
9. Mehrotra R, Singh D, Tiwari A. Physico-chemical analysis of low calorie high protein shrikhand prepared using stevia leaf powder. *Innovare J Food Sci.* 2014;2(1): [No Further Details Available].
10. Srikanth K, Kartikeyan S, Adarsh K, Punitha K, Sharanabasava. Aloe vera and its application in dairy and food products. *Res J Anim Hus Dairy Sci.* 2016;7(2):84-90.
11. López Z, Jinez NG, Navarro AG, Rivera G, Flores SJ, Ramírez JA, *et al.* Antioxidant and cytotoxic logical effects of Aloe vera food supplements. *J Food Qual.* 2017; [No Further Details Available].
12. Javed S, Rahman AU. Chapter 9 - Aloe vera gel in food, health products, and cosmetics industry. *Stud Nat Prod Chem.* 2014;41:261-285.
13. Rodriguez H, *et al.* Aloe vera as a functional ingredient in foods. *Food Sci Nutr.* 2010;50(4):305-326.
14. Pandey SK, *et al.* Preparation and quality assessment of

- Shrikhand prepared using buffalo milk blended with stevia leaf powder. *Int J Chem Stud.* 2018; [No Further Details Available].
15. Rathore V, Madras G. Synthesis of biodiesel from edible and non-edible oils in supercritical alcohols and enzymatic synthesis in supercritical carbon dioxide. *Fuel.* 2007 Dec 1;86(17-18):2650-9.
 16. Singh M, Gupta R, Andhare BC, Singh S. Effect of fat and sugar on sensory quality of Shrikhand. *Res. J Animal Hus. & Dairy Sci.* 2015;6(1):52-56.
 17. Yoshifuji M, Shima I, Inamoto N, Hirotsu K, Higuchi AT. Synthesis and structure of BIS (2, 4, 6-tri-tert-butylphenyl) diphosphene: Isolation of a true phosphobenzene. *Journal of the American Chemical Society.* 1981 Jul;103(15):4587-9.