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Preparation of herbal ice cream by using aloe Vera with mint flavour

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Abstract

The present investigation was made with an attempt to develop an ice cream by partial addition of different level of aloe vera and mint. For control ice cream, mix was standardized to 10% milk fat, 15 % sugar, 0.5% stabilizer & emulsifier, to obtain 37.5% total solids. Treatment T₁ was standardized to 10% fat, 15% sugar, 0.5% stabilizer & emulsifier, 5% aloe vera juice and 0.5% mint extract. T₂ was standardized to 10% fat, 15% sugar, 0.5% stabilizer & emulsifier and 10% aloe vera juice and 0.5% mint extract. T₃ was standardized to 10% fat, 15% sugar, 0.5% stabilizer & emulsifier and 15% aloe vera juice and 0.5% mint extract. The total solids of T₀, T₁, T₂, T₃ was adjusted to 37.5% by addition of SMP. The data collected on different aspects were tabulated and analysed statistically using method of variance and critical difference. Physico - chemical analysis was carried out to ascertain the extend of variation in (fat, protein, carbohydrate, moisture, total solid, acidity, ash) and Organoleptic characteristics like (color and appearance, flavor and taste, body and texture, over run, and melting resistance) was done by trained panelist using 9 point hedonic scale. The microbiological analysis was also performed to study the consumption quality of the manufactured ice cream. According to sensory evaluation T₂ was found to be best among the treatments and can be rated as T₂ > T₀ > T₁ > T₃.

Keywords: herbal ice cream, aloe vera juice, mint extract

Introduction

Ice cream is a delicious and nutritious frozen dairy dessert with high calorific value. Ice cream is a frozen dairy product made by freezing a mix with agitation to incorporation air and ensures uniformity of consistency. The composition of ice cream varies depending upon the ingredients used its preparation. The percentage composition of a good ice cream is milk fat 10%; milk solids not fat 12%; sugar 15%; stabilizer and emulsifier 0.5%. Ice cream is treated as a junk food and deleterious for heart patients due to high calories and cholesterol. Ice cream could be made more nutritious and health beneficial by adding herbs and other protein rich ingredients. Products of dairy origins are the main ingredients of ice cream. These include whole milk, skimmed milk, cream, frozen cream, condensed milk product and milk solids. Other ingredients include flavoring matters and water. Two types of ice cream, soft and hard, are available in the market. Worldwide per capita consumption of ice cream is 2.3 liters with USA leading at 22 liters Australia, 18 liters, UK 7 liters, Thailand 1.8 liters, Pakistan 400 ml and India 300 ml (Muralidharan A., 2009) Almost 40% of the ice creams sold in the country are consumed in the western region with Mumbai being the main market, followed by 30% in the north, 20% in the south and 10% in the east. There is considerable interest in extending the range of food by incorporating herbs in dairy foods for infant dairy food formulas, baby foods, fruits juice based products and pharmaceuticals.

Aloe Vera

Aloe Vera is one of the oldest known medicinal plants gifted by nature; Aloe Vera, often called miracle plant is known by many names. There are over 200 types of Aloe Vera and of these only 4 or 5 are commonly used in medicines. The most widely used variety of Aloe Vera is Barbandismiller. It is perennial, succulent plant with stiff fleshy leaves. Aloe Vera is a clear thin gelatinous material that comes from inside the Aloe Vera leaves. Aloe Vera juice also improves blood circulation due to its ability to detoxify. It is also a natural healer, and hence any internal ulcers or lesions will be soothed and healing will be enhanced. Aloe vera works as anti-septic, antibacterial, antiviral, anti-carcinogenic and anti-inflammatory. It has been reported to cure eczema, diabetes, arthritis and is said to prevent infection. It also improves human immune system and digestive system.

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Mint

Peppermint was first described in 1753 by Carl Linnaeus from specimens that had been collected in England. Mint is a member of family (Lamiaceae), Menthapiperita, is a herbaceous rhizomatous perennial plant growing to 30–90 cm with smooth stems. The rhizomes are wide-spreading, fleshy, and with bare fibrous roots. The leaves are from 4–9 cm long and 1.5–4 cm broad, dark green with reddish veins and with an acute apex and coarsely toothed margins. The leaves and stems are usually slightly hairy. The flowers are purple, 6–8 mm long, with a four-lobed corolla about 5 mm diameter. They are produced in whorls around the stem, forming thick, blunt spikes. Peppermint has high menthol content, and is often used in tea and for flavouring ice cream, confectionery, chewing gum and tooth paste. The oil also contains menthone and menthyl esters, particularly menthyl acetate. One animal study has suggested that peppermint may have radio protective effects in patients undergoing cancer treatment (Baliga and Rao, 2008). The aroma of peppermint has been found to enhance memory (Moss *et al.*, 2008) ^[14].

Material and Methods

The experiment “Preparation of herbal ice-cream by using aloe Vera with mint flavor” was carried out in the Laboratory of Student Training Dairy Plant, Warner College of Dairy Technology, Sam Higginbottom University of Agriculture, Technology & Science, Allahabad (U.P.) India.

Procurement and collection of ingredients

- Whole milk was collected from Students Training Dairy Plant, SHUATS
- Cream was collected from Students Training Dairy Plant, SHUATS
- Skim milk powder [SMP] was collected from Students Training Dairy Plant, SHUATS
- Sugar was purchase from local market.
- Emulsifier, Stabilizers, was collected from Students Training Dairy Plant, SHUATS.
- Aloe Vera was collected from horticulture department of SHUATS.
- Mint oil was purchase from local market.

Treatments Combination

- T₀- 100:00:00 (I:A:M)
- T₁- 95:5:0.5 (I:A:M)
- T₂- 90:10:0.5 (I: A:M)
- T₃- 85:15:0.5 (I:A:M)

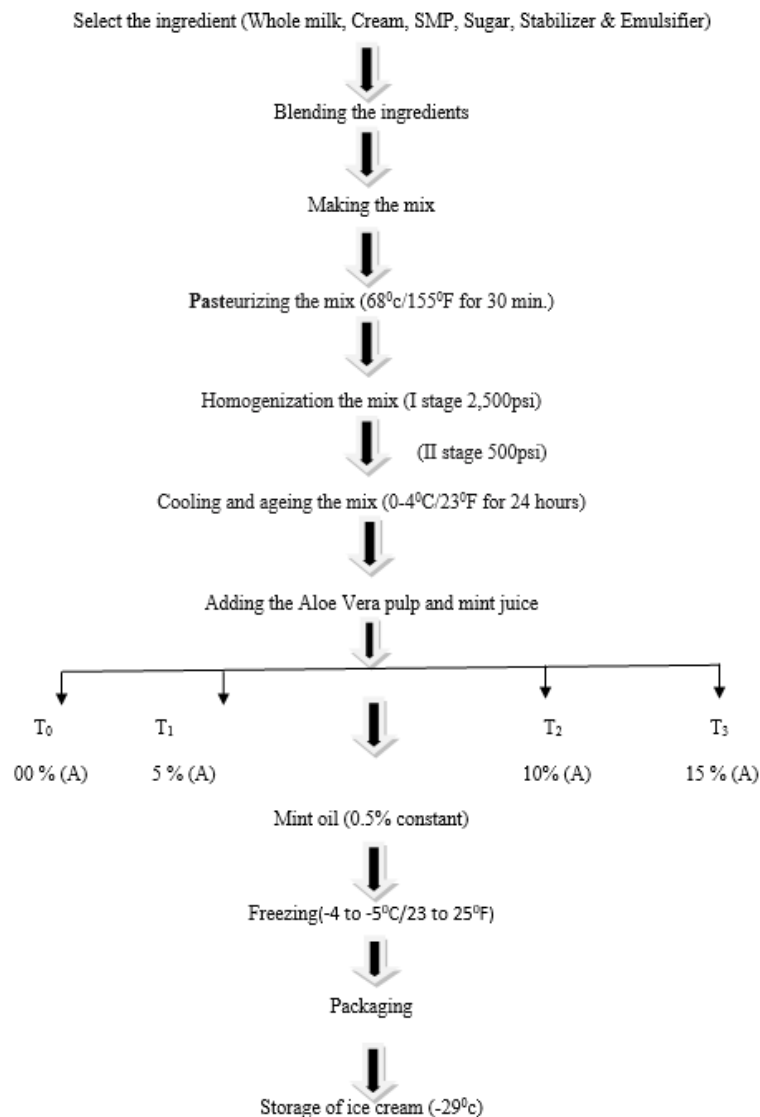
Where,

I = Ice Cream Mixture

A = Aloe Vera

M = Mint

Flow diagram for manufacturing of Herbal ice cream Aloe Vera with mint flavor



Sensory evaluation

The treatment combinations of the herbal Ice Cream were prepared and subjected to evaluation for sensory attributes by a panel of judges. The Ice Creams were evaluated for Color & Appearance, Body & Texture, Flavor & Taste and Overall Acceptability on 9-point Hedonic Rating Scale where 9 represented excellent sample.

Chemical analysis

The different treatment combinations of herbal Ice Cream were subjected to chemical analysis and following parameters were determined:

Moisture: Moisture content of the ice cream was calculated by using FSSAI Laboratory Manual 1.

Carbohydrate: Carbohydrate was estimated by Lane and Eynons method.

Protein: Protein content of the frozen mixture was determined by Kjeldahl method as per Pearson's Composition and Analysis of Foods, 9th edn 1991.

Fat: Fat content of the Ice Cream was calculated By Gerber method (FSSAI Laboratory Manual 1).

Ash: Ash was estimated by muffle furnace (Ranganna, 1986).

Acidity: Acidity was determined by using FSSAI Laboratory Manual 1.

Total Solids: Total Solids were calculated by using FSSAI Laboratory Manual 1.

Melting Resistance: Melting Resistance was determined by placing a scoopful of the sample on a dish and noting its response to melting from time to time (Nelson and Trout 1951) [16].

Overrun: Overrun were calculated by the method given in Sommer (1951) as per IS2802:1964. A known volume of mixture was weighed accurately (W_1) and then the same volume of frozen dessert were weighed (W_2) and the overrun was determined as follows:

$$\% \text{ Overrun} = [(W_1 - W_2)/W_2] \times 100$$

Microbiological analysis

- Standard plate count
- Coli form count

Results and Discussions

The present study was based to evolve "Preparation of Herbal Ice Cream by Using Aloe Vera with Mint Flavor". The data collected on different aspects were tabulated and analyzed statistically using analysis of variance and critical difference. The significant and non-significant differences observed have been analyzed critically within and between the treatment combinations.

Chemical analysis of experimental ice cream

Parameter	Treatment				C.D Value
	T ₀	T ₁	T ₂	T ₃	
Fat	10.16	9.61	9.34	9.24	0.260
Protein	3.36	3.50	3.50	3.22	0.16
Acidity	0.16	0.19	0.21	0.23	0.04
Ash	0.63	0.63	0.69	0.68	0.06
Total Solids	37.36	37.19	37.21	36.29	0.06
Carbohydrate	23.25	23.51	23.66	23.55	0.67
Moisture	62.44	62.81	62.79	63.71	0.69

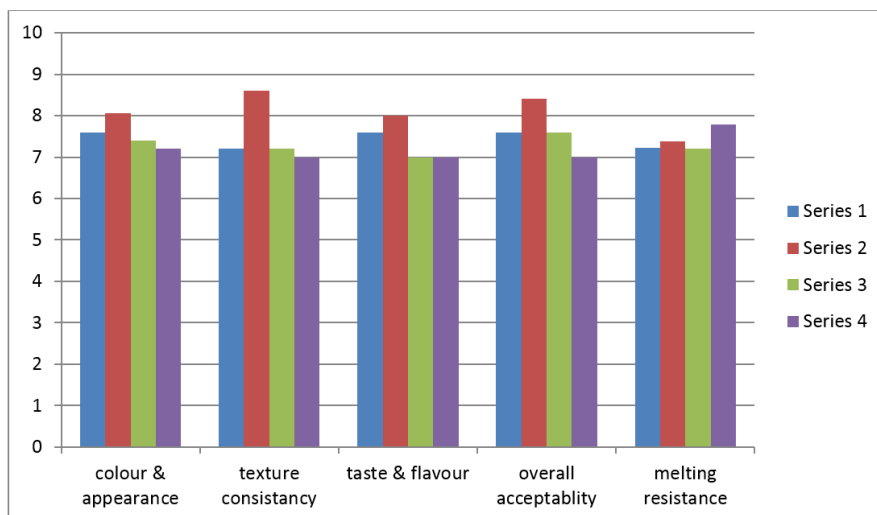
Microbiological Analysis

Parameters	T ₀	T ₁	T ₂	T ₃	C.D Value
SPC(10^3 cfu/g)	18.40	18.0	17.40	16.00	4.22
Coliform test (10^2 cfu/g)	N	N	N	N	-

Organoleptic Scores (9 Point Hedonic Scale)

Parameters	T ₀	T ₁	T ₂	T ₃	C.D Value	S.Ed Value	Result
Color & appearance	7.60	8.06	7.40	7.20	0.874	0.416	Significant
Texture Consistency	7.20	8.60	7.20	7.00	0.696	0.332	Significant
Taste and Flavor	7.60	8.00	7.00	7.00	0.757	0.361	Significant
Overall acceptability	7.60	8.40	7.60	7.00	0.883	0.420	Significant
Over run content	67.60	71.40	74.0	76.20	3.386	1.612	Significant
Melting resistance	7.24	7.37	7.21	7.79	0.050	0.024	significant

Significant at 5 % level



Conclusion

The result obtained from the statistical analysis revealed that as per the experimental T₂ = 95:10:0.5 (I: A: M) received highest score and was liked very much by the panel of judges in the Organoleptic evaluation, best in chemical characteristic (maximum total solids, acidity, protein, carbohydrate and ash), best in microbial analysis (SPC and negative in coli form test) thereby indicating good storage stability of Ice cream. Ice Cream is one of the oldest fat rich delicious dairy products relished by all age groups of people throughout the world.

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