

Studies on Sensory Evaluation of Herbal Ice-Cream with Addition of Ginger (*Zingiber officinale*) Juice

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Received on: 18-02-2016; Revised and Accepted on: 04-03-2016

ABSTRACT

A study was conducted to develop an ice-cream by partial addition of ginger juice and to evaluate its effect on microbial quality of the product. For control, Ice-cream mix was standardized to 10% milk fat, 15% sugar, cream, SMP and 0.5% stabilizer and emulsifier to obtain 37.5% total solids and treatment (T₁) was standardized to 10% fat, 2% ginger juice, 0.3% stabilizer and 0.2% emulsifier. (T₂) was standardized to 10% fat, 15% sugar, 0.3% stabilizer, 0.2% emulsifier, 4% ginger juice. (T₃) was standardized to 10% fat, 0.3% stabilizer, 0.2% emulsifier and 6% ginger juice. The ice-cream samples of different treatments are analyzed for physicochemical (fat, total solids, acidity, protein, moisture, ash) and sensory characteristics (flavour and taste, body and texture, colour and appearance) by trained panelist using 9 point hedonic scale. The treatments containing 4% level of ginger juice score the highest value. The data regarding cost analysis of control and herbal ice-cream (prepared from ginger juice) was found as expensive in T₃ (95.82 Rs/L), followed by T₂ (93.52 Rs/L), T₁ (90.99 Rs/L) and T₀ (88.72 Rs/L). Thus, as far as product acceptability judged by sensory evaluation, the treatment can be rated as T₂>T₀>T₁>T₃.

Keywords: Herbal Ice-cream, Ginger juice, Sensory evaluation, Cost analysis.

INTRODUCTION

Ice-cream is a frozen dairy product made by suitable blending and processing of cream and other milk products, together with sugar and flavour, with or without stabilizer or colour and with the incorporation of air during the freezing process (De, 1980). It is palatable, healthful and relatively inexpensive food. One serving of a good vanilla Ice-cream supplies approximately 200 calories, 3.9g protein, 0.31g calcium, 0.104g of phosphorus, 0.14g of iron, 548 IU Vitamin A, 0.038mg thiamine and 0.236mg riboflavin (Aneja et al., 2002). Demand for Ice-cream is increasing day by day. Not only children but adults and elders also enjoy the delicacy of Ice-cream. Previously the consumption of Ice-cream was seasonal in India but now-a-days it became a regular item of the diet and demanded throughout the year. Ginger (*Zingiber officinale*) is a native plant in the Southeast Asia but is grown in many tropical regions of the world. The plants are commonly used as spice for flavoring and herbal medicine and the treatment of gastrointestinal infections. Ginger is a strengthening food that has been used through the ages to boost health. It has a fresh lemon like smell and pungent warm taste. Valued highly for its healing properties, ginger has enjoyed an excellent reputation in Indian traditional medicine. The medicinal properties of ginger prevent cough and cold is well documented. As a flavour, ginger adds a clean freshness of its own while lifting the other flavours in a recipe. Ginger flavoured Ice-cream can also be considered as an herbal Ice-cream as it offers many health benefits (Buchman, 1980). There is a need for an herbal ice-cream as it will enhance the therapeutic value of the product which otherwise does not have a therapeutic appeal. Therefore, keeping in mind the functional and therapeutic properties an attempt has been made to explore the use of ginger for manufacturing herbal Ice-cream by using the method of manufacture as lay down by Arbuckle, 1985.

METHOD AND MATERIALS

First of all, a calculated amount of milk and cream was

placed in a stainless steel container and mixed with the help of wooden ladle and heated by placing the pan in a container containing water over direct fire to 50°C. Mixing of solid ingredients was done by keeping skim milk powder, sugar and stabilizer together. Standardized mix was homogenized at 150kg/cm² in first stage and 50 kg/cm² in second stage at 60-62°C. Then pasteurization of the mix was done at 68.3°C for 30 minutes. After that cooling and ageing of the mix was done at 5°C for 6 hours. At this point Ginger juice was added @ 2% (T₁), 4% (T₂) and 6% (T₃) into the mix. Freezing in a batch freezer is done at -4°C in 8 minutes. It was then packed and sent for hardening at -18°C. Now the product is ready to be marketed.

Table No. 1: Details of different treatments using ginger juice for preparation of Control and Herbal Ice-cream.

Materials	Different treatments (Control and Herbal Ice-cream)			
	T ₀	T ₁	T ₂	T ₃
Ginger juice	-	2%	4%	6%

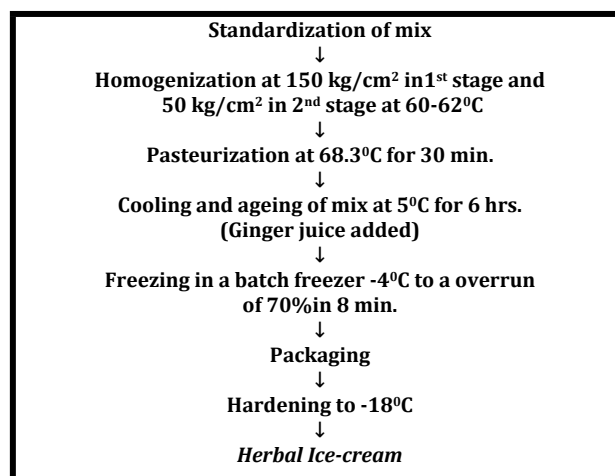


Fig. 1: Flow chart for preparation of Control and Herbal Ice-cream

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Organoleptic Evaluation of the prepared product:

Freshly prepared were control and herbal ice-creamserved for evaluation to panel members consisting of 5 experienced persons. 9 point hedonic scale proforma was used as suggested by Amerine et.al. (1965).

Statistical analysis:

The data obtained on different aspects as per plan were tabulated and statistically analyzed as per Chandel (1991).

RESULT AND DISCUSSION

Table -2.Shows average of different parameters studied.

Sensory properties of control and herbal ice-cream:

Table-2 shows Sensory properties of control and herbal ice-cream.

Table No. 2: Sensory properties of control and herbal ice-cream

Parameters (Score)	Control andHerbal Ice-cream				F Value	CD
	T ₀	T ₁	T ₂	T ₃		
Colour and Appearance	7.92	7.84	8.24	7.88	1.749**	-
Body and Texture	8.12	7.92	8.26	7.76	1.792**	-
Flavour and Taste	8.44	7.84	8.36	7.84	7.402*	0.365
Melting resistance	8.20	8.04	8.56	8.12	9.294*	0.230

* Significant at 5 % level; ** Non-significant at 5 % level

Colour and Appearance:

As per table-2, the highest score for colour and appearance was found in T₂ (8.24), followed by T₀ (7.92), T₃ (7.88) and T₁ (7.84). There was no significant difference found in colour and appearance score of control and herbal ice-cream samples. F Value was 1.749, indicating no significant effect of treatment on colour and appearance (Fig.2).

Body and texture:

The highest score was found in T₂ (8.26), followed by T₀ (8.12), T₁ (7.92) and T₃ (7.76). There was no significant difference found in body and texture score control and herbal ice-creamsamples. F Value was 1.792, indicating no significant effect of treatment on body and texture (Fig.2).

Flavour and Taste:

The highest score was found in T₀ (8.44), followed by T₂ (8.36), T₃ (7.84) and T₁ (7.83). There was significant difference found in flavour and tastecontrol and herbal ice-cream samples. F Value was 7.402, indicating no significant effect of treatment on flavour and taste (Fig.2).

Melting Resistance:

The highest score was found in T₂(8.56) followed by T₀(8.20), T₃(8.12) and T₁(8.04).There was significant difference found inmelting resistance scorecontrol and herbal ice-cream samples. F Value was 9.294, indicating no significant effect of treatment on melting resistance (Fig.2).

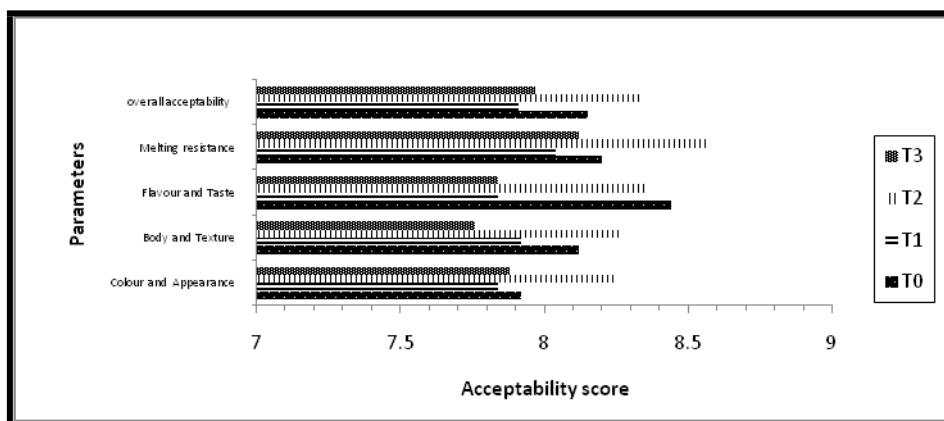


Fig. 2: Average of sensory properties and overall acceptability score controland herbal ice-cream

Overall acceptability scores for control and herbal ice-cream:

There were significant differences found among the treatments for overall acceptability score. The highest score was T₂(8.34), followed by T₀(8.15), T₃(7.97) and T₁(7.91). F Value was

4.643, indicating significant effect of treatment on overall acceptability (Fig.2).

Table No. 3: Overall acceptability of the product

Replication	Control andHerbal Ice-cream				F Value	CD
	T ₀	T ₁	T ₂	T ₃		
1	8.30	7.90	8.25	7.70	4.643*	0.275
2	8.50	7.65	8.40	8.05		
3	8.15	8.15	8.45	8.10		
4	8.10	8.10	8.25	8.15		
5	7.70	7.75	8.35	7.85		
Mean	8.15	7.91	8.34	7.97		

* Significant at 5 % level;

** Non-significant at 5 % level

Cost analysis of control andherbal ice-cream:

The data regarding Cost analysis of control and herbal ice-cream (prepared from ginger juice) was found as expensive in T₃

(95.82 Rs/L), followed by T₂ (93.52 Rs/L), T₁ (90.99 Rs/L) and T₀ (88.72Rs/L)(Table.4 and Fig.3).

Table No. 4: Cost analysis of control andherbal ice-cream

Parameters	Control andHerbal Ice-cream			
	T ₀	T ₁	T ₂	T ₃
Cost(Rs/L)	88.72	90.99	93.52	95.82

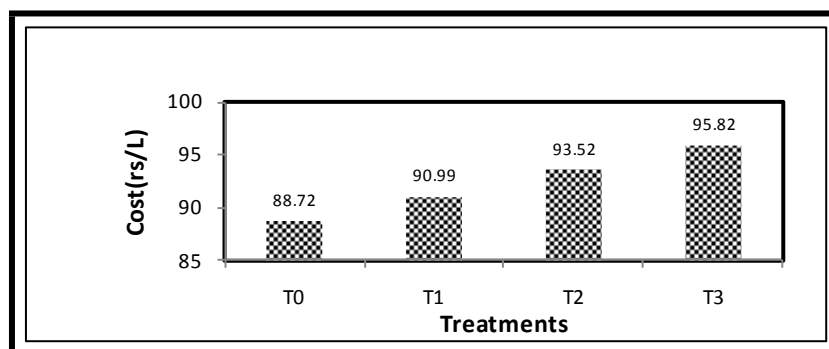


Fig. 3: Cost analysis of control andherbal ice-cream

CONCLUSION

The treatments containing 4% level of ginger juice score the highest value. The data regarding cost analysis of control and herbal ice-cream (prepared from ginger juice) was found as expensive in T₃ (95.82 Rs/L), followed by T₂ (93.52 Rs/L), T₁ (90.99 Rs/L) and T₀ (88.72 Rs/L) Thus, as far as product acceptability judged by sensory evaluation, the treatment can be rated as T₂ > T₀ > T₁ > T₃. On the basis of result obtained it can be concluded that the ginger can be successfully used for the preparation of herbal ice-cream, without sacrificing its palatability and therapeutic values.

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How to cite this article:

J. David: Studies on Sensory Evaluation of Herbal Ice-Cream with Addition of Ginger (*Zingiber officinale*) Juice, J. Pharm. Res., 2016; 5(2): 18-20.

Conflict of interest: The authors have declared that no conflict of interest exists.

Source of support: Nil