



Studies on organoleptic attributes and cost analysis of soy ice-cream

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ABSTRACT : With the current upward trend in nutritional and health awareness, the consumer demand is for high nutritive valuable product in the market with acceptable sensory characteristics. The present study was undertaken with different levels (10%, 20% and 30%) of soymilk used in ice cream preparation. Different samples of soy ice cream treatments and control were analyzed for fat, lactic acid, total solids, protein, ash and organoleptic characteristics (flavour and taste, body and texture, colour and appearance, overall acceptability). The data obtained on various parameters were statistically analyzed. It was observed that the soy ice cream prepared with 20 per cent (T_2) soymilk was highly acceptable in terms of flavour and taste, texture and overall acceptability as compared to the other experimental treatment combination.

KEY WORDS : Ice cream, Soymilk, Organoleptic attributes, Cost analysis

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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, 1982). 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 and 0.104g of phosphorus, 0.14g of iron, 548 IU Vitamin A, 0.038mg thiamine and 0.236mg ribo flavin (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. Soymilk is a beverage

made from soybeans could be used as an alternate choice for making ice cream because it is normally used as a substitute for dairy milk and soybean also a source of bioactive molecules. It contains high amount of proteins, polysaccharides, and indigestible fibre, unsaturated fat and Lecithin, Vitamins and minerals, as well as bioactive organic molecules. This approach will give relatively cheaper and nutritious product which can find popularity in common market. Soy milk is rich in isoflavones. Cow's milk does not contain isoflavones. Isoflavones in soymilk have many health benefits including reduction of cholesterol, easing of menopause symptoms, prevention of osteoporosis and reduction of risk for certain cancers (Prostate and breast cancer). Incidents of cancers are very low in countries with intake of soy product, including soy milk. This will also provide avenues for utilization of soymilk to produce high quality protein rich foods. The present investigation is planned with a view to optimize the process of manufacturing of soymilk ice cream following the process of Bhandari (2001).

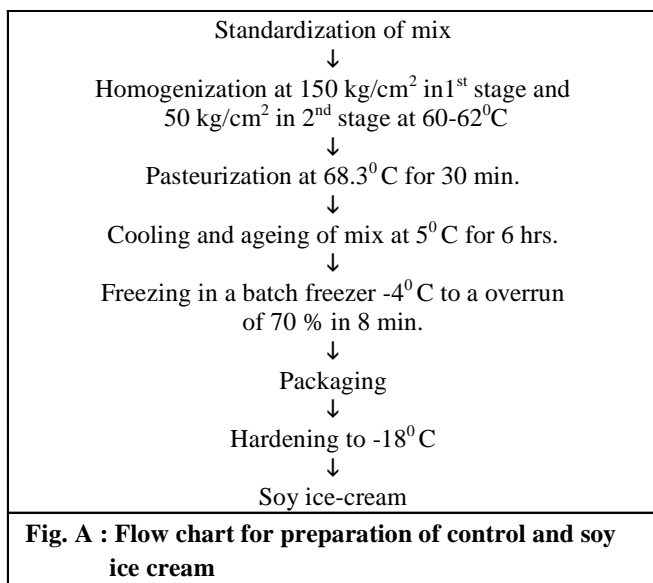
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Materials	Different treatments (Control and soy ice cream)			
	T ₀	T ₁	T ₂	T ₃
Whole milk (%)	100	90	80	70
Soymilk (%)	-	10	20	30

MATERIAL AND METHODS

First of all calculated amount of soymilk was added into calculated amount of milk and cream as per calculation for T₁ (10%), T₂ (20%), T₃ (30%) and heated to 50°C. Then calculated amount of dry ingredients like skim milk powder, stabilizer and emulsifier was mixed and added to liquid ingredients and thoroughly stirred with the help of wooden ladle. Then ice cream mix is homogenized at 150 kg/cm² in first stage and 50 kg/cm² in 2nd stage at 60-62°C using Nonton Gaulin two stage homogenizer. Mix was then pasteurized at 68.3°C for 30 minutes by batch method and cooled at 5°C and held for 4-6 hours. Finally the mix was frozen and hardened at -18°C (Fig. A). The samples were analyzed for physio-chemical, microbial and organoleptic qualities as per the procedure laid down by BIS (1964), ICAR manual in Dairy Chemistry and microbiology (1972).



Organoleptic evaluation of the prepared product :

Freshly prepared ice cream was served 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 :

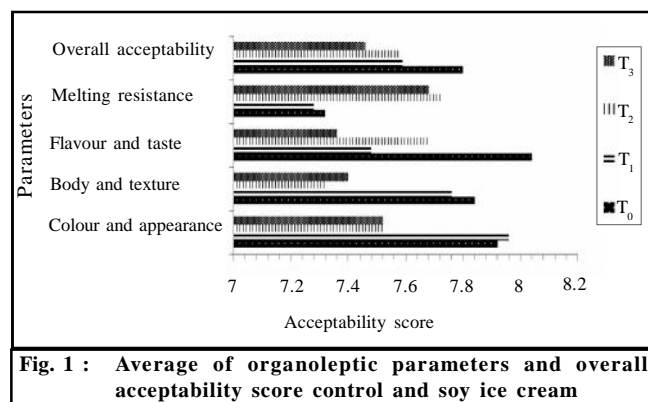
The data obtained on different aspects as per plan were tabulated and statistically analyzed as per Chandel (1991).

RESULTS AND DISCUSSION

The results of the present study as well as relevant discussions have been presented under following sub heads:

Colour and appearance :

The highest mean for colour and appearance in soymilk ice cream was found in T₁ (7.96), followed by T₀ (7.92), T₂ (7.52) and T₃ (7.52) (Table 1). The data differed significantly. This may be due to the different percentage of soymilk used for different treatments. F value was 8.772, indicating significant effect of treatment on colour and appearance (Fig.1).



Body and texture :

The highest mean for body and texture was found in T₀ (7.84), followed by T₁ (7.76), T₃ (7.40) and T₂ (7.32) (Table 1). The treatment differed significantly. F value was 4.44, indicating significant effect of treatment on body and texture (Fig.1).

Flavour and taste :

The highest mean for flavour and taste for soy ice cream was found in T₀ (8.04), followed by T₂ (7.68), T₁

(7.48) and T_3 (7.36) (Table 1). They were different significantly. F Value was 10.797, indicating significant effect of treatment on flavour and taste (Fig. 1).

Melting resistance :

The highest mean value for melting resistance was found in T_2 (7.72), followed by T_3 (7.68), T_0 (7.32) and T_1 (7.28) (Table 1). The values were significant. F value was 4.671, indicating significant effect of treatment on melting resistance.

Overall acceptability :

Table 2 and Fig. 1 showed the mean value for overall acceptability. The highest mean for overall acceptability was found in T_0 (7.80), followed by T_1 (7.59), T_2 (7.580) and T_3 (7.46). All the treatments were significantly different. Thus, showed a quality product with addition of soymilk.

Overall acceptability of the control and soy ice cream:

Cost analysis of control and soy ice cream :

The data regarding cost of control and soy ice cream

was found as expensive in T_3 (48.01Rs./ lit), followed by T_2 (47.61 Rs./ lit), T_1 (47.17 Rs./lit) and T_0 (46.50 Rs./lit) (Table 3 and Fig.2). Similar results were also obtained by David (2012) on the related topic. Chavan *et al.* (2014) studied on the effect of sugar free-low fat levels on chemical composition, melting period and cost of production of softy ice-cream, Andhare *et al.* (2010) studied on preparation of softy ice-cream from safflower milk blended with buffalo milk.

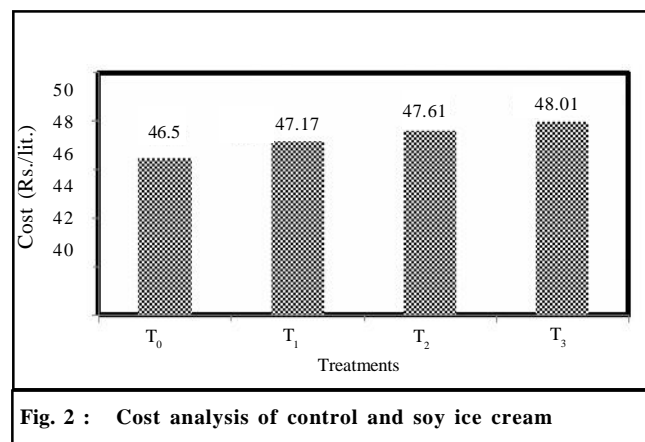


Table 1 : Organoleptic parameters of control and soy ice cream

Parameters (%)	Control and soy ice cream				F value	C. D.
	T_0	T_1	T_2	T_3		
Colour and appearance	7.92	7.96	7.52	7.52	8.772*	0.251
Body and texture	7.84	7.76	7.32	7.40	4.44*	0.374
Flavour and Taste	8.04	7.48	7.68	7.36	10.797*	0.277
Melting resistance	7.32	7.28	7.72	7.68	4.671*	0.328

* indicate significance of value at P=0.05

Table 2 : Overall acceptability of the product

Parameters	Control and soy ice cream				F value	C.D.
	T_0	T_1	T_2	T_3		
R_1	7.95	7.85	7.65	7.55	3.742*	0.223
R_2	7.65	7.55	7.35	7.50		
R_3	7.65	7.50	7.60	7.75		
R_4	7.80	7.50	7.65	7.35		
R_5	7.95	7.55	7.65	7.15		
Mean	7.80	7.59	7.58	7.46		

* indicate significance of value at P=0.05

Table 3 : Cost analysis of control and soy ice cream

Parameters	Control and soy ice cream			
	T_0	T_1	T_2	T_3
Cost (Rs./lit)	46.50	47.17	47.61	48.01

Conclusion :

From the present investigation, it may be concluded after studying the statistical results of different parameters indicated above thatsoymilk can be satisfactorily added for quality ice cream making. 10-20 per cent level of soymilk produced excellent product.

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